# Grove G5 Wellhead Protection Structure Decommissioning Programme


**Consultation Draft**

**23rd October 2025**

SPIRIT ENERGY

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| **Prepared by:** | A Sabu | A Sabu | 02/09/2025 |
| **Reviewed by:** | K Nicolson | K Nicolson | 02/09/2025 |
| **Approved by:** | C Wheaton | C Wheaton | 23/10/2025 |

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| ABBREVIATION | EXPLANATION |
|---|---|
| ~ | Approximately |
| COP | Cessation of Production |
| CSV | Construction Support Vessel |
| DESNZ | Department for Energy Security and Net Zero |
| DP | Decommissioning Programme |
| DSV | Diving Support Vessel |
| EA | Environmental Appraisal |
| EAJ | Environmental Assessment Justification |
| EMS | Environmental Management System |
| HSE | Health and Safety Executive |
| IWS | International Waste Shipments |
| JNCC | Joint Nature Conservation Committee |
| Km | Kilometre |
| m | Metre(s) |
| MAT | Master Application Template |
| n/a | Not Applicable |
| NFFO | National Federation of Fishermen's Organisations |
| NIFPO | Northern Ireland Fish Producers Organisation |
| NORM | Naturally Occurring Radioactive Material |
| NSTA | North Sea Transition Authority |
| NUI | Normally Unmanned Installation |
| OEUK | Offshore Energies UK |
| OPEP | Oil Pollution Emergency Plan |
| OPRED | Offshore Petroleum Regulator for Environment and Decommissioning |
| OSPAR | Oslo Paris Convention (The Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention') |
| P&A | Plug and Abandon |
| PL | Pipeline Identification numbers (UK) |
| PON | Petroleum Operations Notice |
| PWAV | Pipeline Works Authorisation Variation |
| SAC | Special Area of Conservation |
| SAT | Supplementary Application Template |
| Spirit Energy | Spirit Energy Resources Limited |
| UK | United Kingdom |
| UKCS | United Kingdom Continental Shelf |

| | |
|---|---|
| UTA | Umbilical Termination Assembly |
| VCS | Valve Control Skid |
| WGS84 | World Geodetic System 1984 |
| WHPS | Wellhead Protection Structure |

## HOLDS LIST

# 1. EXECUTIVE SUMMARY

## 1.1 Installation Decommissioning Programme

This document contains one Decommissioning Programme (DP) for the Grove G5 wellhead protection structure (WHPS) and associated production well Xmas tree.

Spirit Energy Resources Limited (Spirit Energy) has identified a potential early opportunity to plug and abandon the single Grove G5 production well, which requires removal of the WHPS. The Grove G5 well is part of the Grove West subsea facilities. To facilitate this potential early opportunity, the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) has agreed that this standalone DP can be submitted to cover this specific decommissioning scope.

A separate DP document will also be submitted to OPRED in due course covering the decommissioning proposals for the remaining Grove infrastructure.

Therefore, this standalone document contains one DP covering the Grove G5 WHPS and the associated Xmas tree.

In the event that the potential early opportunity to remove the Grove G5 WHPS and plug and abandon its production well does not materialise, Spirit Energy will continue to explore cost saving synergies with other projects, including the future decommissioning of the Grove field.

## 1.2 Requirement for Installation Decommissioning Programme

In accordance with the Petroleum Act 1998, Spirit Energy, as operator of the Grove field, and on behalf of the Section 29 notice holders (Table 1.4.2), are applying to OPRED to obtain approval for decommissioning the installation detailed in Section 2.1 of this document. (See also Section 7 – Section 29 Notice Holders Letter(s) of Support.

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programme is submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document (see Figure 6.3.1) is for a 3-year decommissioning project plan which could commence offshore as early as Q1 2026 if DP approval is in place and if the potential early decommissioning opportunities materialise. If not, the schedule may extend to the end of 2028 to allow for campaigning synergies with other projects.

## 1.3 Introduction

The WHPS is located in block 49/10a (License No:P83) of the Grove field within the Southern North Sea, The Grove West (G5) well is located in Block 49/10, 131km to the east of the UK (Norfolk coast), and 7km from the UK/Netherlands Median line, in a relatively flat area of the southern North Sea in water depths of ~40m. The WHPS was originally installed as part of the Grove Extension Project, operated by Spirit Energy, to provide subsea protection for the Grove West subsea tree and well. The Well has reached the end of its operational life and will be removed in accordance with the Petroleum Act 1998, OPRED guidance, and all other relevant UK legislation. The WHPS is not sited in any protected/designated areas. The Grove West subsea well is tied back to the Grove Normally Unattended Installation (NUI) via a 1.6 km long pipeline. A 6-inch carbon steel production pipeline and a dedicated control umbilical connect the Grove Xmas tree to the Grove choke valve skid, and the east end of the pipeline is connected by a carbon steel tie-in spool to the base of the existing 6-inch riser on the leg B1 of the Grove NUI platform. The WHPS houses the Xmas tree and associated Grove G5 well, providing physical protection from fishing gear, dropped objects, and other seabed hazards. Production of the well commenced in 2008 following a sidetrack operation. Gas is exported from Grove West via Grove NUI to the Markham J6-A platform and onward to shore.

The scope of the programme is removal of the WHPS roof panel to allow well P&A activities to be performed and subsequent removal of the WHPS base following well P&A. Decommissioning of the other Spirit Energy facilities in the Grove West field, namely the Grove West Choke Valve Skid VCS, 6-inch production pipeline (PL2639), controls umbilical (PLU2640) & associated spools, jumpers, protection and stabilisation will be covered under a separate DP which will be supported by a Comparative Assessment (CA) and an Environmental Appraisal (EA).

## 1.4 Overview of Installation Being Decommissioned

| Table 1.4.1 Installation being decommissioned | | | |
|---|---|---|---|
| **Field(s):** | Grove | **Production Type** | Gas |
| **Water Depth (m)** | Approx. 40m | **UKCS Block** | 49/10a |
| **Distance to median (km)** | ~7 | **Distance from nearest UK coastline (km)** | ~131 |
| **Subsea Installation(s)** | | **Number of Wells** | |
| Number | Type | Platform | Subsea |
| 1 | WHPS (Telescopic) | n/a | 1 |
| 1 | Xmas tree | | |
| **Drill Cuttings Pile** | | | |
| Number of Piles | n/a | Total Estimated volume ($m^3$) | n/a |

**Note:** There are no piles associated with WHPS connecting it to seabed. The four drop-down leg extensions at each corner do not penetrate far into the seabed.

| Table 1.4.2 Installation Section 29 Notice Holders Details | | |
|---|---|---|
| **Section 29 Notice Holder** | **Registration Number** | **Equity Interest (%)** |
| Spirit Energy Resources Limited | 02855151 | 92.5 |
| RockRose (UKCS3) Limited | 04620801 | 7.5 |
| GB Gas Holdings Limited | 03186121 | 0 |
| Sojitz Corporation | JP5010401049977 | 0 |

## 1.5 Summary of Proposed Decommissioning Programme

| Table 1.5.1 Summary of Decommissioning Programme | | |
|---|---|---|
| **Selected Option** | **Reason for Selection** | **Proposed Decommissioning Solution** |
| **1. Subsea Installation** | | |
| Complete removal to shore for reuse, recycling or disposal. | To comply with OSPAR requirements leaving clear seabed. Removes a potential obstruction to fishing operations and maximises recycling of materials | The Xmas tree and separate WHPS will be completely removed from the seabed and recovered to shore for reuse, recycling or disposal. The WHPS is designed for hydraulic retrieval using a dedicated running/retrieval tool; however, alternative methods such as mechanical release or sectional cutting/recovery may be adopted if required. |
| **2. Well** | | |
| Well conductor will be cut to -3m below seabed. Plugged and abandoned to comply with HSE "Offshore Installations and Wells Design and Construction Regulations 1996" and in accordance with the latest edition of OEUK Guidelines for the Abandonment of Wells. | Meets HSE regulatory requirements and is in accordance with OEUK and NSTA guidelines and license conditions. | A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of activities carried out. Additionally, planned work will be reviewed by a well examiner then submitted to HSE for review. |
| **3. Interdependencies** | | |
| The rigid tie-in spool (PL2639) and the associated control jumper (PLU2640) between the well and the choke valve skid will be disconnected to facilitate the WHPS removal. No spools, jumpers, or the choke valve skid will be recovered at this stage and the decommissioning of these will be included within the future Grove DP to be submitted for OPRED review in due course. All Grove West pipelines and umbilicals are located within the 500m safety zone. Risk is managed and mitigated through the continued enforcement of the safety zone, and any seabed disturbance from disconnection activities will be minimal and limited to the immediate area of the works. The pipeline ends will remain un-remediated at this stage but secured within the zone, with final remediation undertaken during the subsequent decommissioning phase.<br>There are 11 Concrete mattresses installed around the tie-in spool and control jumper locations. These items may need to be safely repositioned to facilitate safe and efficient disconnection of spool and umbilical. They will not be recovered at this stage and the decommissioning of these will be included within the future DP to be submitted for OPRED review in due course. | | |

## 1.6 Field Location including Field Layout and Adjacent Facilities

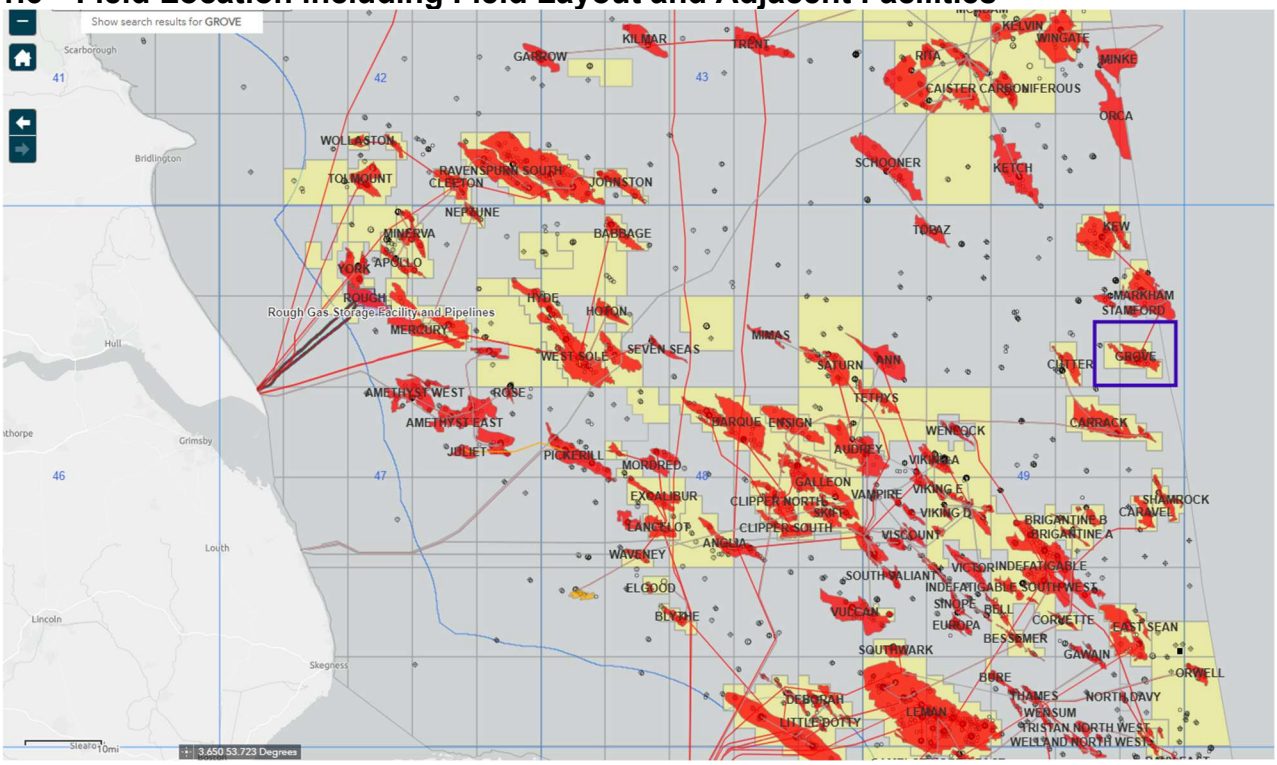



*Figure 1.6.1 Field Location in UKCS and Adjacent Facilities*

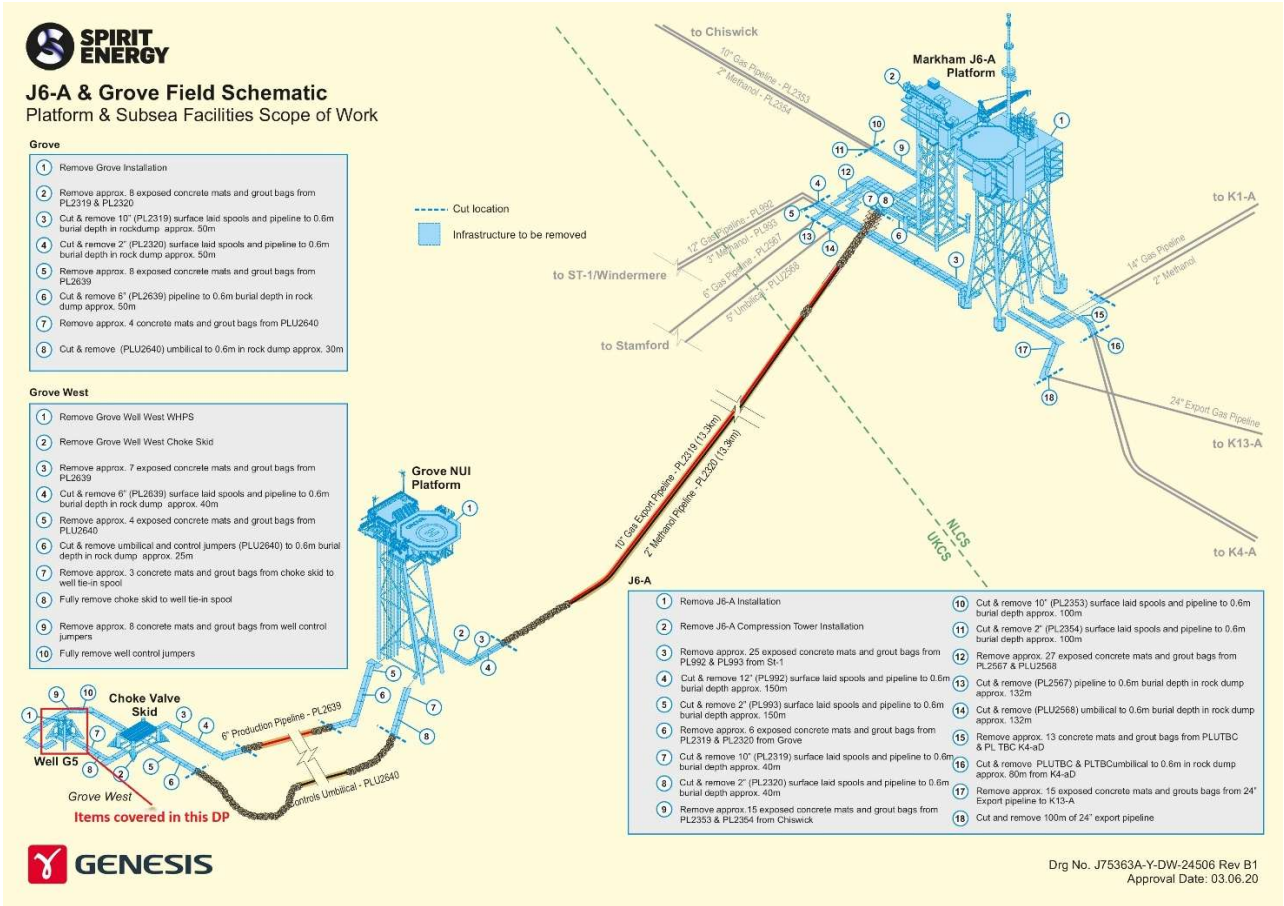



*Figure 1.6.2 Grove G5 Facilities Schematic*

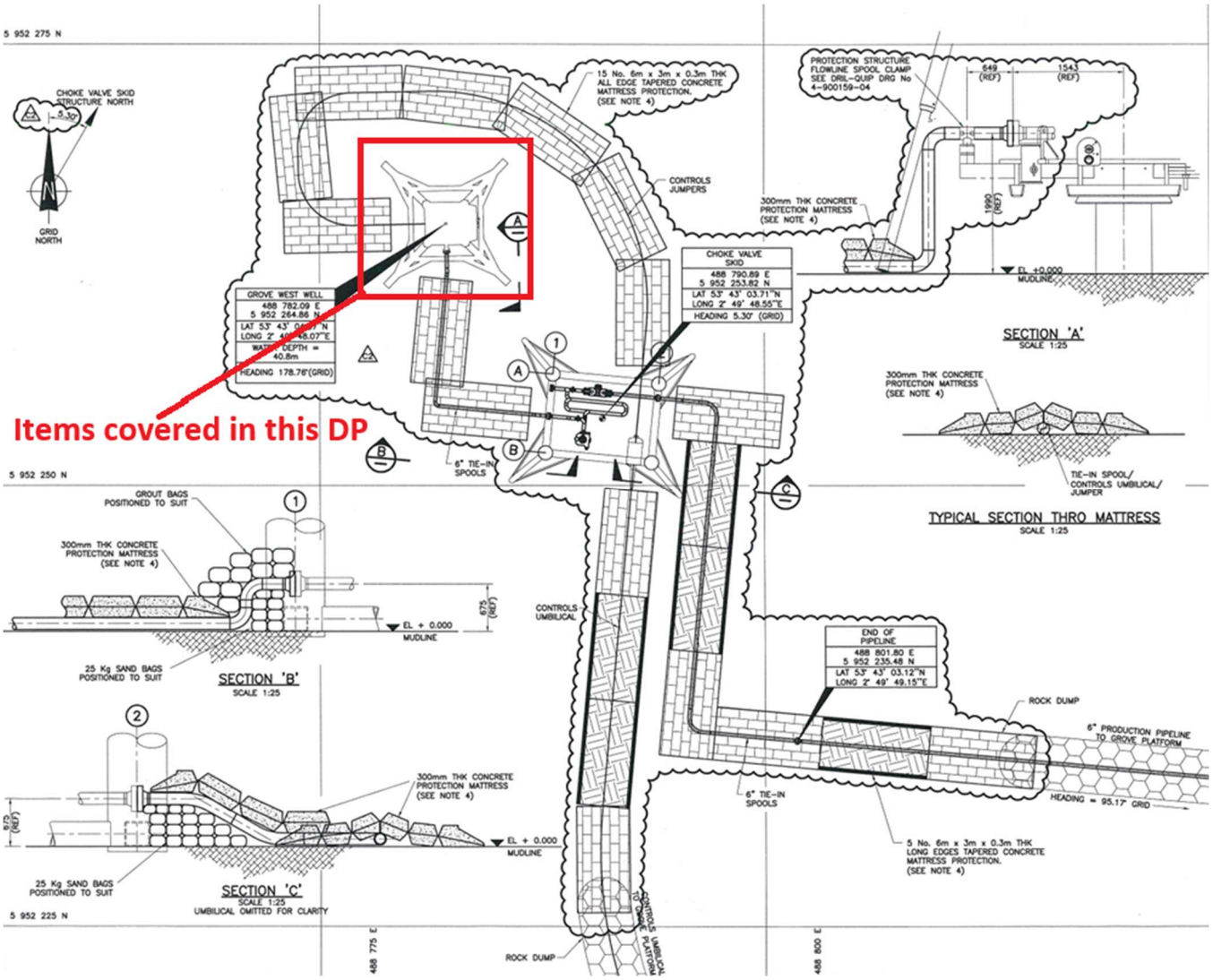



*Figure 1.6.3 Grove G5 WHPS Layout*

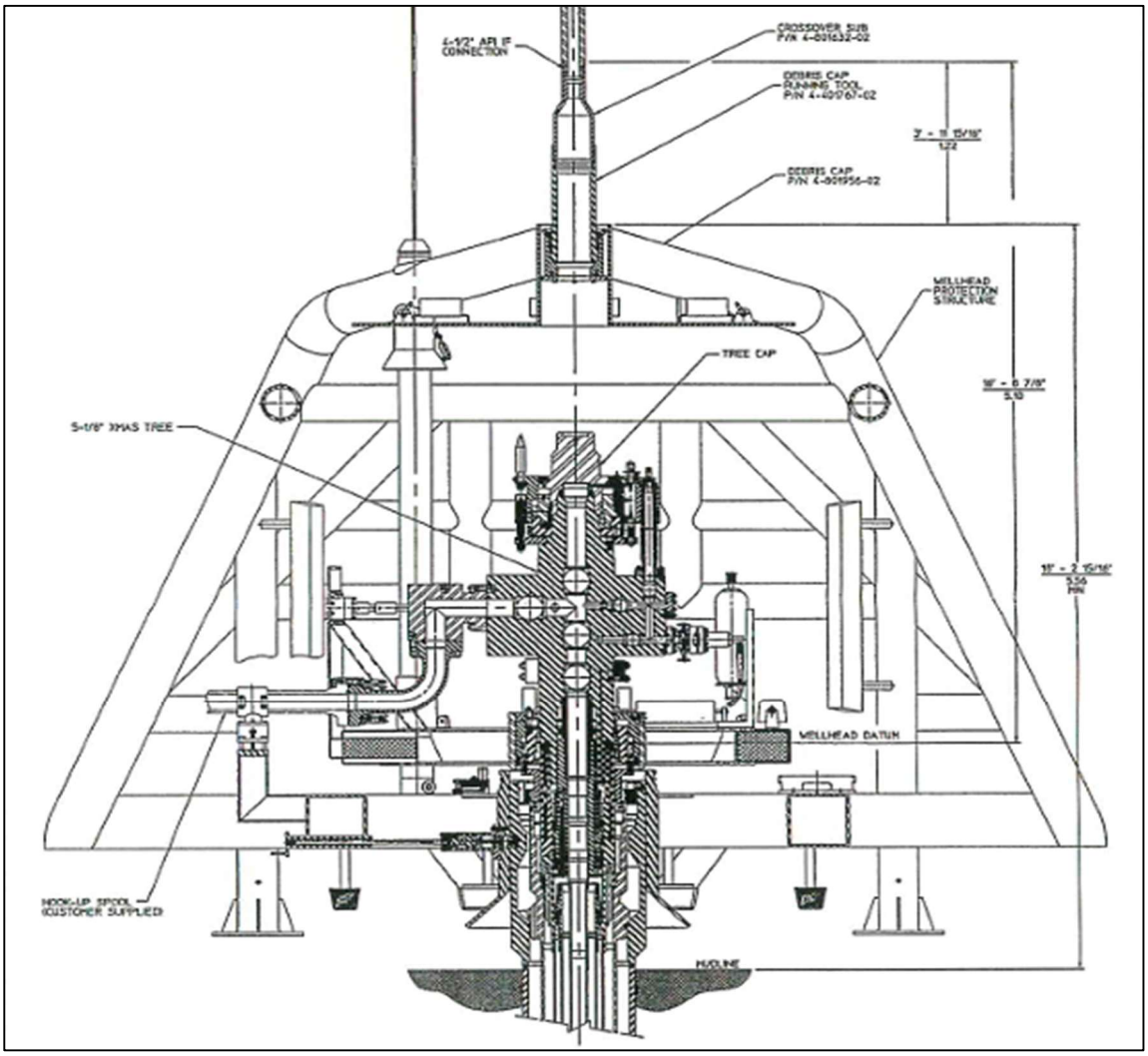



*Figure 1.6.4 Grove G5 WHPS and Xmas tree*

| Table 1.6.1 Adjacent Facilities | | | | | |
|---|---|---|---|---|---|
| **Operator** | **Name** | **Type** | **Distance/Direction** | **Information** | **Status** |
| Spirit Energy Resources Limited | Grove NUI | Normally Unmanned Installation | ~1.6 km East of Grove West | Receives production from Grove East/West and exports to Markham J6-A | Operational |
| Spirit Energy North Sea Limited | Chiswick | NUI | ~18 km NW of Grove | Onstream 2007; tied back to J6A. | Operational |
| Spirit Energy North Sea Limited | Kew | Subsea tie-back | ~14 km N of Grove (via Chiswick) | Onstream 2013; tied into Chiswick/GMA system. | Operational |

| Table 1.6.2 Adjacent Facilities | | | | | |
|---|---|---|---|---|---|
| **Operator** | **Name** | **Type** | **Distance/Direction** | **Information** | **Status** |
| Spirit Energy Resources Limited | Grove west Choke skid | Grove West well choke valve skid | East of Grove West | Tied in with west well via 6" pipeline and UTA | Operational |
| Spirit Energy Nederland B.V. | Markham | Processing hub (J6-A) | ~7.5 km NE of Grove | Installed 2006 (J6A platform), subsea tiebacks later; exports via J6A. | Operational |
| INEOS UK SNS Limited | Windermere | NUI | ~13Km NW of Grove (within GMA cluster) | Installed 1996; exported via Markham ST-1. | Decommissioned |
| Impacts of Decommissioning Proposals | | | | | |
| There are no direct impacts on adjacent facilities from the decommissioning and removal of the WHPS. Environmental impacts are generally short-term and highly localised to the well location and are detailed in Section 4.<br>The Grove G5 pipelines are connected to a choke valve skid structure. However, these will be covered in a separate DP and will not be included here, as there are no impacts from the decommissioning of the WHPS. | | | | | |

## 1.7 Industrial Implications

Well abandonment activities will be completed using a rig and / or well intervention vessel. Decommissioning work will be carried out by a rig, Dive Support Vessel (DSV) / Construction Support Vessel (CSV) or a combination of vessels. A survey vessel may be utilised for post-decommissioning surveying.

Spirit Energy has developed a contract strategy and Supply Chain Action Plan that will result in an efficient and cost-effective execution of the decommissioning works. Spirit Energy will seek to combine the decommissioning activities with other development or decommissioning activities to reduce mobilisation costs should the opportunity arise. The decommissioning schedule is extended to allow flexibility for when decommissioning operations are carried out and completed.

# 2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

## 2.1 Installations: Subsea Including Stabilisation Features

| Table 2.1.1 Grove G5 Subsea Installations and Stabilisation Features | | | | |
|---|---|---|---|---|
| **Subsea Installations Including Stabilisation Features** | **Mass (Te)** / **Size (m)** | **Location** | | **Comments/Status** |
| | | **WGS84 Decimal** | **WGS84 Decimal Minute** | |
| Grove G5 Xmas tree | 15.2 / 2.5 × 2.5 × 5.3 m | +53.716972° N / +2.828389° E | 53° 43' 01.1''N / 02° 49' 42.2"E | |
| Grove G5 tree integral WHPS (Including roof panel) | 27.5 / 7.20 x 7.20 × 4.93 m | | | Conductor mounted telescopic structure |

**NOTES:**

1. The WHPS mass includes the removable roof panel, which will be recovered to enable P&A. The base of the WHPS will be recovered post well P&A.
2. 11 Concrete mattresses are installed over the tie-in spool & control jumper locations for protection. These stabilisation items are not included within this DP as, although they may be repositioned to facilitate safe and efficient disconnection of spools and umbilicals, they will not be recovered at this stage. Any repositioning of these items will still be within the existing subsea safety zone which will not be relinquished until clear seabed verification has been completed.

## 2.2 Well

| Table 2.2.2 Well Information | | | |
|---|---|---|---|
| **Well ID** | **Designation** | **Status** | **Category of Well** |
| 49/10a-6z | Gas production | Decommissioned, AB2 | SS-3-4-3 |

**NOTES:**
1. For details of well categorisation please refer to the latest version of the OEUK Guidelines for the Decommissioning of Wells.
2. NSTA guideline: https://www.nstauthority.co.uk/media/8246/nsta-wons-guide_final_accessible_3006.pdf

## 2.3 Drill Cuttings

There are no drill cutting piles associated with these facilities.

## 2.4 Inventory Estimates

The inventory estimates are shown in Figure 2.4.1. Note that the estimates do not include marine growth.

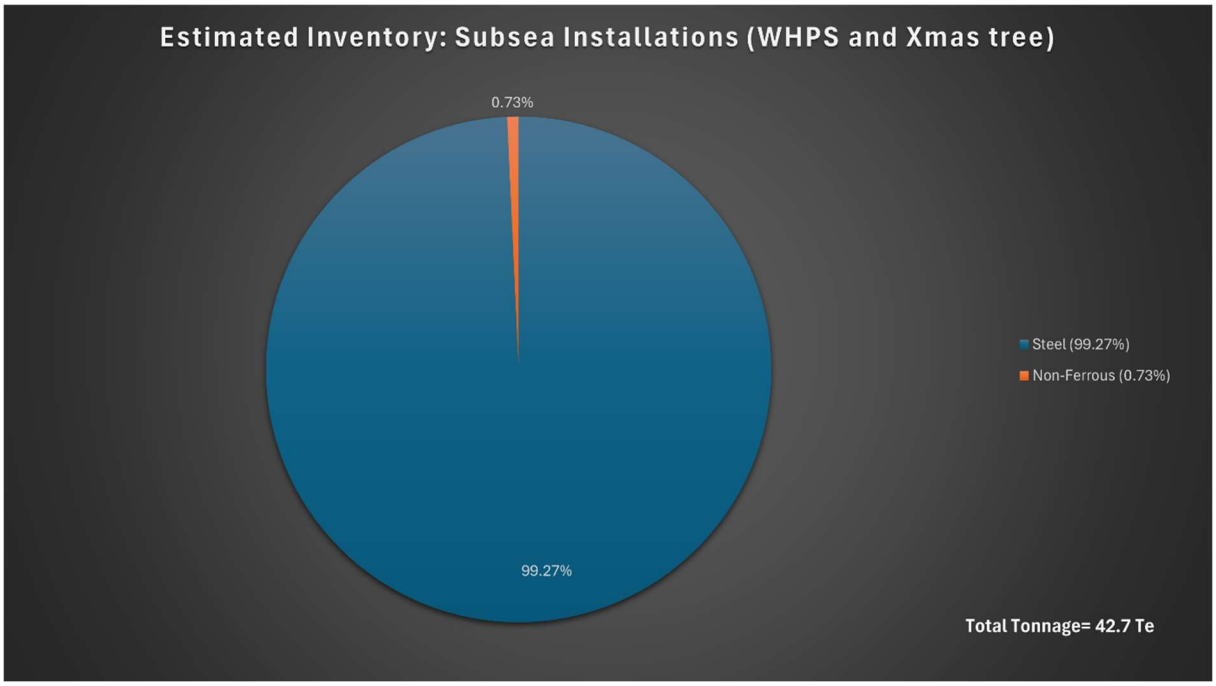



*Figure 2.4.1 Pie Chart of Estimated Inventory (Installations)*

# 3. REMOVAL AND DISPOSAL METHODS

Waste management during decommissioning will be carried out in line with the Waste Framework Directive. Priority will be given to the potential re-use of installations, which remains under active consideration as part of the preferred decommissioning options. All waste generated will be sorted by type and transported to shore at regular intervals using licensed waste contractors, ensuring full traceability. Recyclable materials, particularly steel and other metals—are expected to comprise most of the recovered inventory.

Geographic locations of potential disposal yard options may require the consideration of International Waste Shipments (IWS), including hazardous materials. Early engagement with the relevant waste regulatory authorities will ensure that any issues with IWS are addressed. OPRED shall be informed once the disposal yard is selected.

Materials for which no re-use or recycling opportunities are available will be tracked through to final disposal.

## 3.1 Subsea Installations and Stabilisation Features

Table 3.1.1 Subsea Installations and Stabilisation Features Decommissioning Options

| Subsea installations and stabilisation features | Quantity | Option | Disposal Route (if applicable) |
|---|---|---|---|
| Xmas tree and wellhead | 1 | Full recovery (conductor will be cut 3m below seabed). | Return to shore for reuse, recycling or disposal. |
| WHPS | 1 | Full recovery. | Return to shore for reuse, recycling or disposal. |

The rigid tie-in spool (PL2639) and the associated control jumper (PLU2640) between the well and the choke valve skid will be disconnected to facilitate the WHPS removal. No spools, jumpers, or the choke valve skid will be recovered at this stage and will be included within a future DP.

To protect the facilities and mitigate against the effects of scour, stabilisation features (concrete mattresses) were installed around the tie- in spool and control jumper locations. These items may need to be repositioned to facilitate safe and efficient disconnection of spools and umbilicals. They will not be recovered at this stage and will be included within a future DP.

There will be a period of time between the WHPS roof panel removal and the completion of well P&A. The well is within the Grove 500m subsea safety zone, which will remain in place until the wider Grove decommissioning activities have been completed, providing ongoing mitigation against potential fishing interaction.

## 3.2 Wells

| Table 3.2.1 Well decommissioning |
|---|
| The well, as listed in Section 2.2 (Table 2.1.1) will be plugged and abandoned in accordance with the latest versions of the Offshore Installations and Wells (Design and Construction, etc.) Regulations and OEUK Well Decommissioning Guidelines.<br>A Master Application Template and the supporting Supplementary Application Template will be submitted in support of works carried out. An application to decommission the well will be made via the online Well Operations Notification System (WONS) on the NSTA Energy Portal. Well decommissioning will be scheduled in accordance with the outline schedule presented in Section 6.3. |

## 3.3 Waste Streams

| Table 3.3.1 Waste Stream Management Methods | |
|---|---|
| **Waste Stream** | **Removal and Disposal method** |
| **Bulk liquids** | Processing of any fluids or chemicals associated with decommissioning of the well will be managed under well intervention permits. Recovery of the WHPS may result in a small discharge of chemicals or oil during the spool disconnection which will be covered under appropriate permits. Chemical discharges associated with the umbilical disconnection will be assessed under new permits. |
| **Marine growth** | Where necessary and practicable to allow access, some marine growth will be removed offshore. Remnant growth will be brought to shore and disposed of under the appropriate permit and managed in accordance with guidelines and company policies. A conservative value of 15Te marine growth (60mm thickness covering all steel surfaces) has been estimated. |
| **NORM / LSA Scale** | Although NORM is not expected, tests will be performed offshore, and any NORM encountered will be dealt with and disposed of in accordance with guidelines and company policies and under the appropriate permit and managed in accordance with guidelines and company policies. |
| **Asbestos** | No asbestos is expected, however any such material found will be dealt with and disposed of in accordance with guidelines and company policies. |
| **Other hazardous wastes** | Will be recovered to shore and disposed of according to guidelines and company policies and under appropriate permit. |
| **Onshore Dismantling sites** | Appropriate licensed sites will be selected. The dismantling site must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver reuse and recycling options. |

| Table 3.3.2 Inventory Disposition | | | |
|---|---|---|---|
| **Inventory** | **Total Inventory (Te)** | **Planned tonnage to shore (Te)** | **Planned left *in-situ* (Te)** |
| **Subsea Installations** | 42.7 | 42.7 | 0 |
| **Notes:**<br>1. Marine growth is not included.<br>2. No material will be left *in-situ*. | | | |

| Table 3.3.3 Reuse, Recycle & Disposal Aspirations for Recovered Material | | | |
|---|---|---|---|
| **Inventory** | **Reuse** | **Recycle** | **Disposal (e.g. landfill)** |
| **Subsea Installations** | <2% | >98% | <2% |

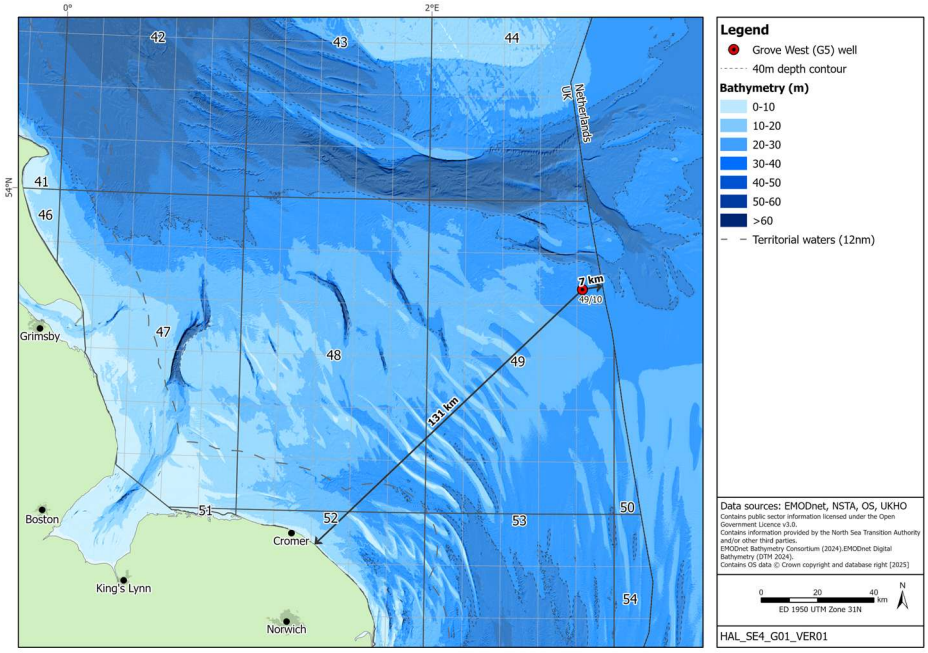
All recovered material will be transported onshore for reuse, recycling or disposal. It is not possible to predict the market for reusable materials with any confidence, so the figures presented here are aspirational.

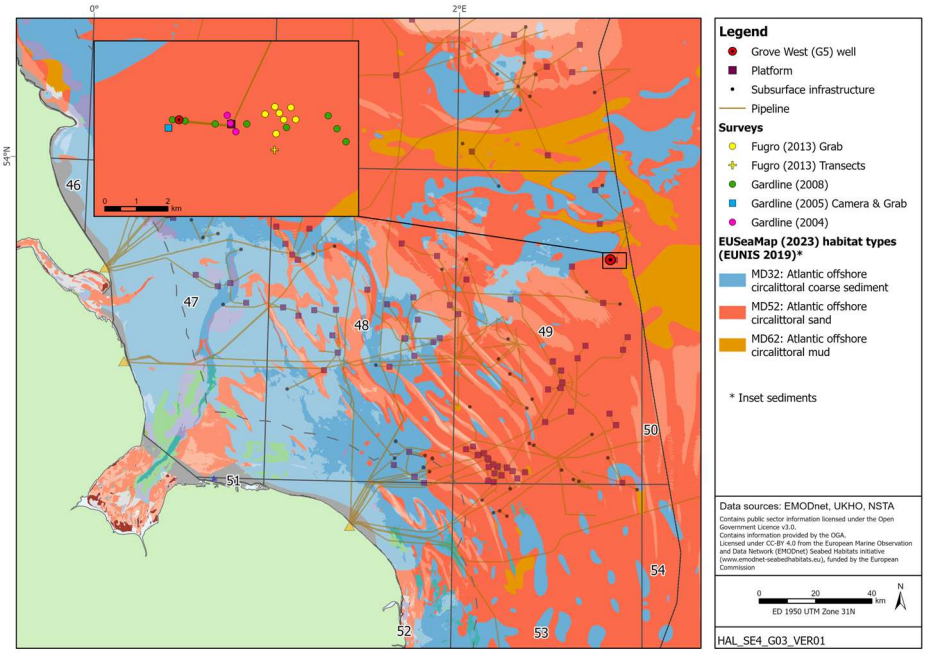
# 4. ENVIRONMENTAL APPRAISAL

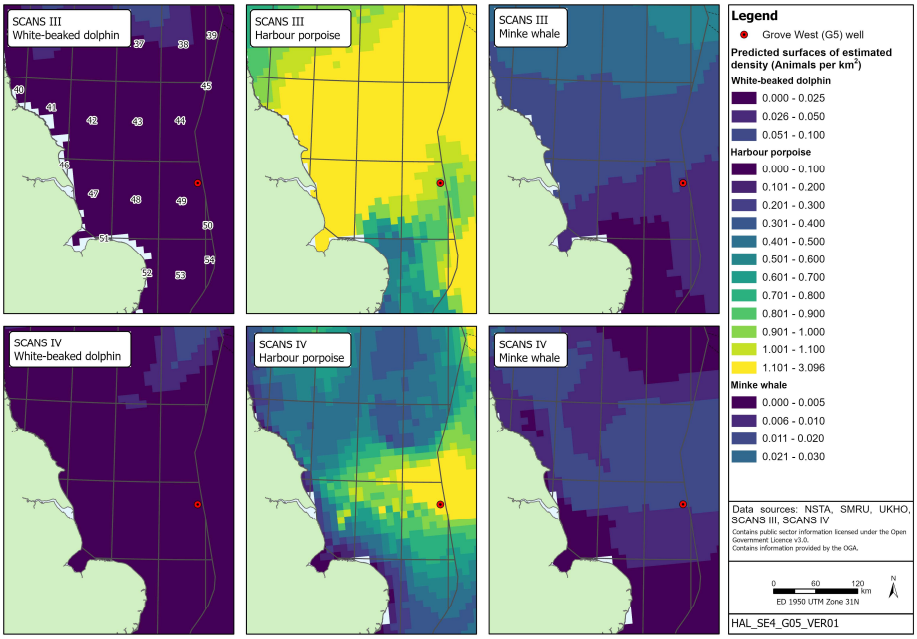
## 4.1 Environmental Sensitivities (Summary)

The environmental sensitivities in the area in which the decommissioning activities will take place are summarised in Table 4.1.1.

Table 4.1.1 Environmental sensitivities

| Environmental Receptor | Main Features |
|---|---|
| **Location** | The Grove West (G5) well is located in Block 49/10, 131km to the east of the UK (Norfolk coast), and 7km from the UK/Netherlands Median line, in a relatively flat area of the southern North Sea in water depths of ~40m.<br>  |
| **Seabed** | Reiss *et al.* (2010) separated the epifauna and infauna of the North Sea into several distinct communities. The infaunal assemblage at the Grove area falls into the "Around Dogger Bank and Pleistocene Elbe Valley" grouping, characterised by the polychaetes *Spiophanes bombyx*, *Magelona filiformis*, the bivalve *Kurtiella bidentata* and the brittlestar *Amphiura filiformis*, with the epifaunal community falling into the "Dogger Bank and around the 50m Contour" group, characterised by the crabs *Corystes cassivelaunus* and *Pagurus bernhardus* and the starfish *Astropecten irregularis* and *Asterias rubens*.<br><br>Predicted seabed habitats around the well are described in the EUNIS classification as MD52: Atlantic offshore circalittoral sand (EMODnet website, see map below) and are broadly classified as sand (Folk 16 classification). Previous surveys indicated Holocene seabed sediments were silty sand, with occasional shell fragments to a depth of >4.5m, with slightly gravelly shelly sand of the Eem and Egmond Ground Formations, underlain by the Swarte Bank Formation, and the sand with interbeds of silty clay of the Yarmouth Roads Formation (Gardline 2005, Gardline 2008a).<br><br>The Grove West well, 48/10a -6 and sidetrack 6z were drilled in 2006 and are both plugged and abandoned (AB2), with sidetrack 6y, being the production well, drilled in 2009 and is presently shut in. A limited number of grab samples have been collected at Grove West, including four near the well in 2005 (Gardline 2005), and eight in 2008 (Gardline 2008a, b) covering the pipeline route to the proposed Grove East well and Grove West. Further sampling was undertaken in 2013 (Fugro 2014) as part of the Grove Deep survey, some ~3km to the east. Additionally, inspection surveys undertaken at the Grove platform (2020), and around the Grove West valve skid and well (2021, 2023) including the collection of seabed imagery and multibeam data have been undertaken. Particle size analysis presented in Gardline (2005, 2008b) and Fugro (2013b) |

| | |
|---|---|
| | indicated the seabed sediment in the area was very poorly sorted to moderately well sorted fine to very fine sand with a variable silt and clay (fines) component. The proportion of fines (<63µm) in sediments at Station 3 of Gardline (2008), 500m west of the Grove platform, was 19.4%, with the remaining stations ranging from 3.4 to 11.9%. Gravel (>2mm) was absent or minimal (0.1%) at all stations.<br><br>Seabed photography at Grove West indicated limited visible epifauna, though some faunal burrows and tracks, and occasional brittle stars, crab and flat fish were present (also noted in footage from the 2021 inspection survey). Drop down and camera transects were undertaken for the Grove Deep survey, with the seabed being characterised as circalittoral fine sand (A5.25), with low diversity and abundance, with only sea stars observed, with heart urchins, brittle stars being recorded in grab samples. Available macrofaunal data indicates a fauna characteristic of fine sands. The results presented in Gardline (2008b) indicated a fauna dominated by juvenile brittlestars, with overall low numbers of individuals across the taxa recorded, which included molluscs (*Varicorbula gibba, Abra alba*), polychaetes (*Megenola filiformis, Nephtys hombergii*) and arthropods (*Eudorella truncatula, Harpinia antennaria*). Available data indicates that no Annex I habitats, Features of Conservation Interest (FOCI) or OSPAR threatened and/or declining habitats or species were present in the Grove area (Gardline 2008a, Fugro 2013a, b).<br><br>  <br><br><br>Total hydrocarbon concentrations recorded at Grove West (Gardline 2008b) were at or close to background levels for all stations, in the range 1.9-6.4µgg$^{-1}$, with metal concentrations similarly being below background concentrations (OSPAR 2005). Oil-Based Muds (OBMs) were not used to drill the Grove well, and there are no cuttings piles associated with the well. No spills have been associated with the operation of the Grove G5 well that could be a source of contamination in the area. The MBES data collected as part of the 2023 inspection survey, and the visual inspection of 2021, did not indicate significant topographic changes in proximity to Grove West, and no debris was identified. |
| **Climate, oceanography and hydrography** | The area generally has a mild climate for the latitude. Winds are variable, coming from all compass points, however, during the winter and early summer north easterly winds are most common, and from July to September, south-easterly winds predominate, with winter (November to March) experiencing the highest frequency of gales (>Beaufort force 7). Annual average wind speeds at 100m are 9.7m/s. The mean spring tidal flow at Grove is ~0.48m/s and annual mean wave height is 1.68m. |
| **Fish** | Species diversity within the fish community is greater in the southern North Sea than in the central or northern North Sea (Callaway *et al.* 2002), characterised by a high abundance of small demersal species (Reiss *et al.* 2010), including solenette, dab and common dragonet. Of the species assemblages more loosely associated with the seabed, two of these could be characterised by whiting, grey gurnard, horse mackerel and dab with high numbers of horse mackerel and mackerel to the south of the region.<br><br>The Grove G5 well is located within ICES rectangle 36F2 which contains reported spawning grounds for cod (January-April, low intensity/occasional, Gonzalez-Irusta & Wright 2016), |

| | |
|---|---|
| | mackerel, *Nephrops* (January-December), plaice (December-March, high intensity), sandeel (November-February, low intensity), sprat (May-August), whiting (low intensity), and nursery grounds for lemon sole, *Nephrops*, sandeel, sprat, whiting (Coull *et al.* 1998, Ellis *et al.* 2012). |
| **Marine mammals** | The southern North Sea generally has a relatively low density of marine mammals, with the likely exception of harbour porpoise. While over ten species of cetacean have been recorded in the southern North Sea, only harbour porpoise and white-beaked dolphin can be considered as regularly occurring throughout most of the year, and minke whale as a frequent seasonal visitor (BEIS 2022).<br><br>Grove is located within the SCANS IV survey stratum NS-C, which was estimated to have the following densities of marine mammal (Gilles *et al* 2023): harbour porpoise (0.6027/km2), white-beaked dolphin (0.0149/km2), bottlenose dolphin (0.0419/km2), common dolphin (0.0032/km2) and minke whale (0.0068/km2) were recorded within the strata.<br><br>Harbour seal are present in the southern North Sea, with a large colony in The Wash, with smaller but important colonies at Donna Nook and Blakeney Point, Scroby Sands off the east Norfolk coast and in the greater Thames area. There is a long established grey seal colony at Donna Nook, with smaller colonies at Blakeney Point and Horsey on the east Norfolk coast. The movement of harbour seals are generally restricted to *ca*. 40-50km range of their haul-out sites, while grey seal movements can involve larger distances. These differences in foraging strategy are reflected in maps of marine usage by harbour and grey seals (Carter *et al.* 2022), which indicate harbour seals are unlikely to be present in the Grove area, with potential use by grey seals, though their core foraging area is closer to the coast.<br><br>A number of conservation sites are present offshore and along the coast with marine mammals as qualifying features, but all are some distance from the Grove G5 well (Southern North Sea SAC, harbour porpoise, 8km; Humber Estuary SAC, grey seal 176km, The Wash and North Norfolk Coast SAC, harbour seal, 136km).<br><br>  |
| **Birds** | There are a number of significant breeding seabird colonies on the east coast (and related SPAs, e.g. Flamborough and Filey Coast SPA, 194km) which include species such as gannet and kittiwake, which may forage as far offshore as the Grove area (Woodward et al. 2024), though their core foraging areas (Cleasby et al. 2020, Langston & Teuten 2018) would be closer to shore, and likely associated with features such as the Flamborough Front to the north of Grove. Post-breeding dispersal will mean some birds, in particular auks, may be present in the offshore area around Grove in greater numbers than during the breeding season, along with birds moving through the area in late summer and autumn on passage to wintering areas, or in spring on route to breeding colonies.<br><br>Seabird oil spill sensitivity is low in Block 49/10, being low in June, July, September and December, medium in August, but with no data across all other months. The surrounding blocks record a similar level of sensitivity throughout the year, with higher sensitivity associated with July and December (49/4, 49/5). The use of data from adjacent months (step 1) and blocks (step 2) as described in JNCC (2017) has been used to indicate the sensitivity for months with no data for |

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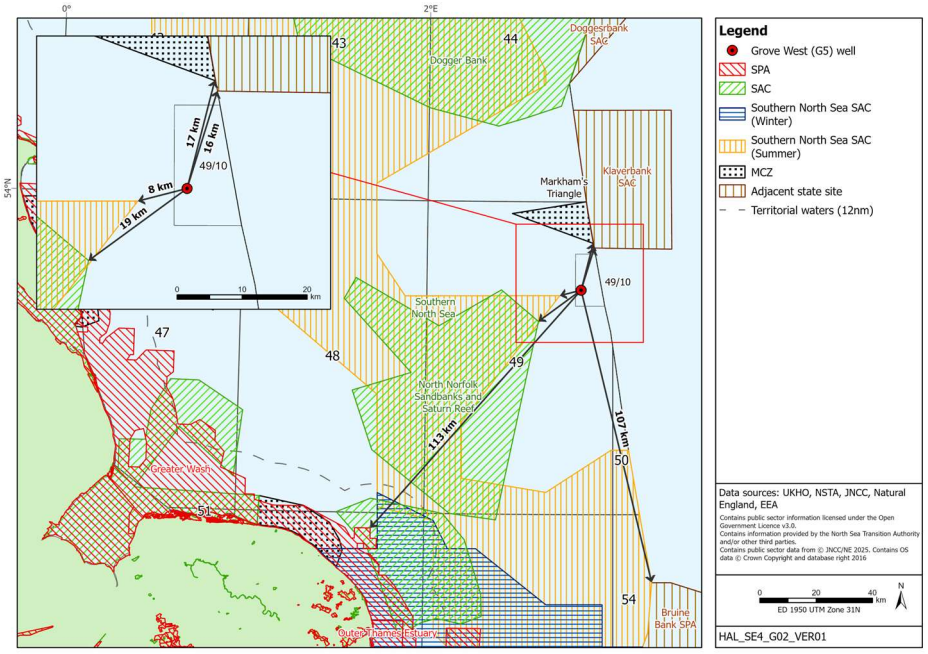
| | Block 49/10 and adjacent blocks, which are marked in red. These steps were insufficient to determine the sensitivity of Block 49/10 for February to April. |
| **Conservation** | A number of conservation sites are located relatively close to the Grove G5 well, which have been designated for a range of habitats and species. An area of the Southern North Sea Special Area of Conservation (SAC) 8km to the west of Grove is predicted to have persistent higher densities of harbour porpoise than surrounding areas in the summer season (April-September). This partly overlaps with the North Norfolk Sandbanks and Saturn Reef SAC 19km to the west of Grove, which is designated for sandbanks and biogenic reef created by the ross worm *Sabellaria spinulosa*. The next closest SAC is Klaverbank, which is in Dutch waters and is designated for grey and harbour seal, harbour porpoise and reef features. Markham's Triangle is the only Marine Conservation Zone (MCZ) in the area, 17km to the north. It is designated for designated for broadscale habitats including Offshore subtidal sands, coarse, and mixed sediments, and mud.<br><br>Special Protection Areas (SPAs) which are designated for certain bird species, are all located some distance from Grove. The closest site is the Greater Wash SPA (113km), classified for wintering features (red-throated diver, common scoter, little gull), but also includes breeding terns (little, common, and Sandwich).<br><br>No Annex I habitats or evidence of threatened and/or declining habitats listed by OSPAR were observed within the Grove survey area (Gardline 2008b).<br><br>  |

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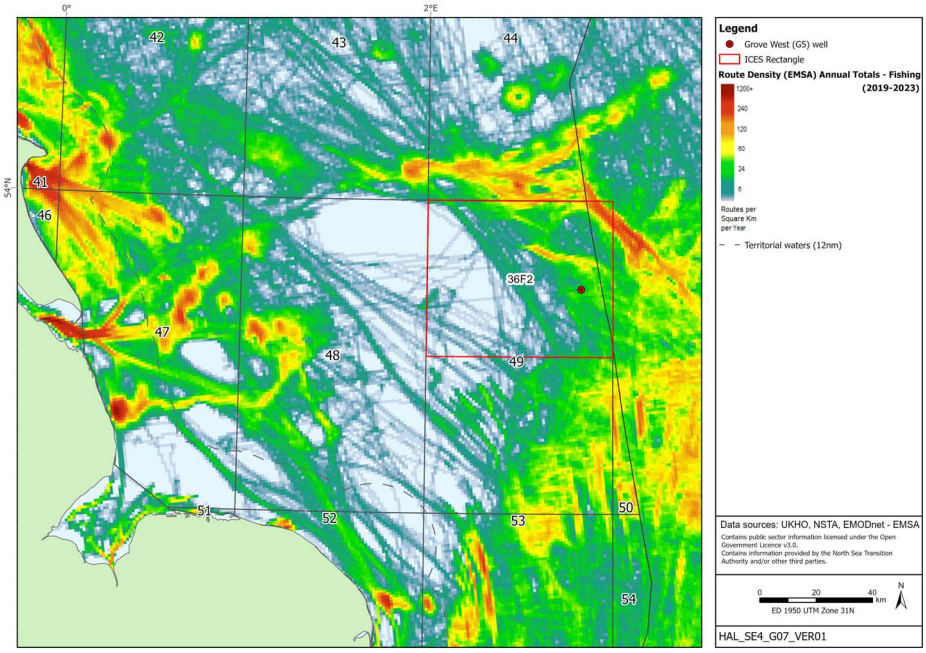
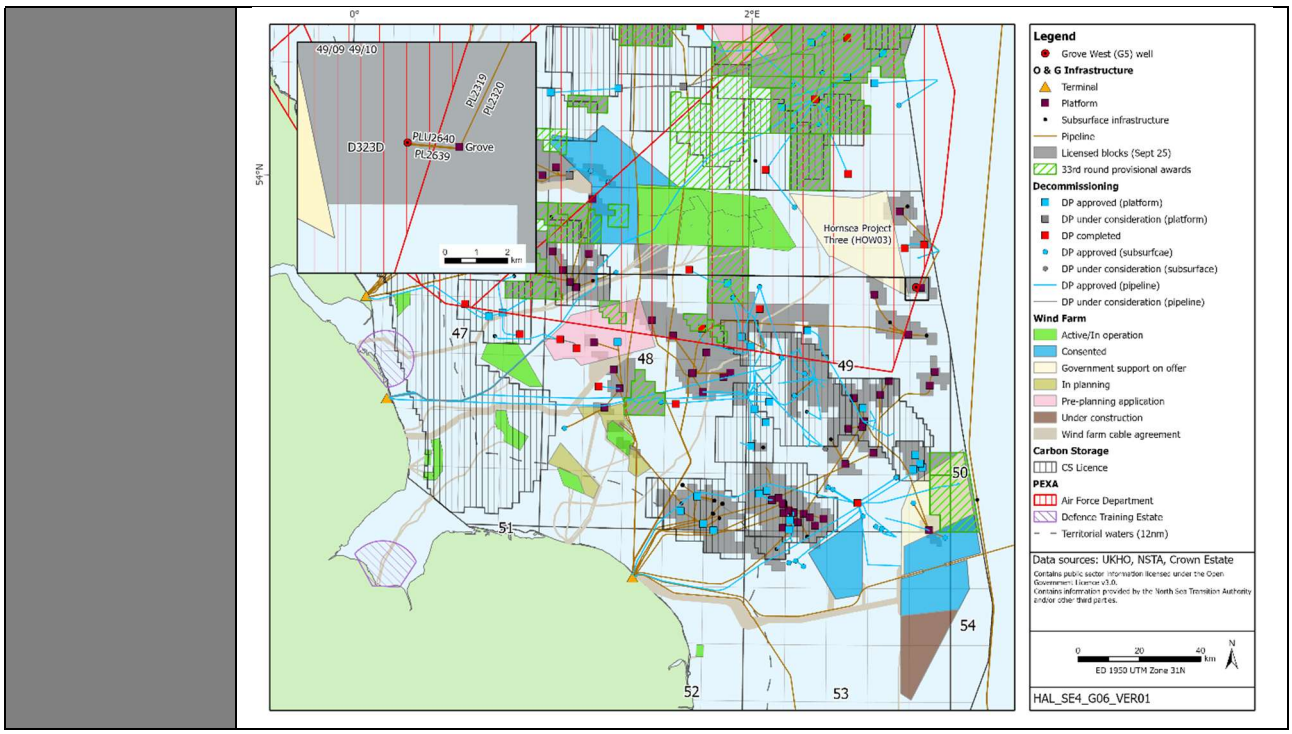
| **Fisheries** | Fisheries effort data is moderate to low in comparison to the wider area, with effort in ICES rectangle 36F2 accounting for <1% of the UK total in 2023 (fishing vessel route density is shown below, note that this does not correspond directly to fishing effort). Based on vessel tracking data, most of the activity takes place in the north of 36F2, including in the deeper areas of Markham's Hole and the Outer Silver Pit, or to the east closer to the coast. Demersal gear and traps are the predominant gear types used, with landings in 2023 being dominated by shellfish in weight (244t) and value (£873,311). This mainly consisted of crabs with some squid, lobster and *Nephrops*. Demersal and pelagic fish accounted for a much smaller proportion (~28%, 96t) of landings from the rectangle, with a corresponding lower value (demersal: £107,597, pelagic: £76,542), which was dominated by red mullet and mackerel, with smaller quantities of other fish. While there is a seasonal component to the catch much of the monthly data is disclosive, though approximately 70% of the annual effort in 2023 was recorded in the months June to October.<br>  |
| **Other Users of the Sea** | The Grove G5 well is located in an area of extensive gas development with a number of installations nearby. Shipping intensity is moderate, with traffic consisting of offshore oil and gas supply activity, and vessel activity associated with decommissioning, as well as several shipping routes for cargo traffic between UK and European ports. Some vessel traffic is associated with offshore wind farm operations, maintenance, and construction. Grove West is approximately 3km from the Hornsea Project Three wind farm which is presently under construction and is due to be completed by 2027. There are relatively few other activities in the area. Apart from the Grove platform ~1.7km to the east, the next nearest facilities are those at Cutter (14km) and Carrack (16km) to the south west. No subsea cables or interconnectors pass close to Grove West (closest is NorseaCom at 29km), and it is located some distance from any licensed aggregates area or carbon storage licence area (30km). Military air force PEXA D323D overlaps the Grove G5 well, and part of the pipeline connecting Grove West to the Grove platform. No special conditions are reflected in the Other Regulatory Issues for Block 49/10 that indicate it is an area of concern for the Ministry of Defence. |


0°
2°E
54°N
49/09 49/10
PL2319
PL2320
D323D
PLU2640
PL2639
Grove
Hornsea Project Three (HOW03)
47
48
49
50
51
52
53
54
Legend
Grove West (G5) well
O & G Infrastructure
Terminal
Platform
Subsurface infrastructure
Pipeline
Licensed blocks (Sept 25)
33rd round provisional awards
Decommissioning
DP approved (platform)
DP under consideration (platform)
DP completed
DP approved (subsurfcae)
DP under consideration (subsurface)
DP approved (pipeline)
DP under consideration (pipeline)
Wind Farm
Active/In operation
Consented
Government support on offer
In planning
Pre-planning application
Under construction
Wind farm cable agreement
Carbon Storage
CS Licence
PEXA
Air Force Department
Defence Training Estate
Territorial waters (12nm)
Data sources: UKHO, NSTA, Crown Estate
ED 1950 UTM Zone 31N
HAL_SE4_G06_VER01

## 4.2 Potential Environmental Impacts and their Management

The proposed activities were considered together with their potential interactions with the environment and legislative and policy requirements. The activity/environmental interactions were identified using a range of sources, including regional and site-specific environmental data, engineering descriptions and drawings, and typical rig and vessel specifications. The potential impacts identified are based upon the removal of the WHPS/Xmas tree, and potential impacts associated with the wider decommissioning of the Grove field will be addressed in an Environmental Assessment supporting a separate Decommissioning Programme. The potential impacts of these operations will be assessed in the MAT EAJ that will be submitted prior to the work commencing. A summary of the actual and related potential impacts, and control measures, is detailed in Table 4.2.1. These impacts are expected to be short-term, localised and of low significance

<table>
<tr><th colspan="3">Table 4.2.1 Environmental impact assessment</th></tr>
<tr><th>Main Impacts</th><th>Impact Assessment</th><th>Management</th></tr>
<tr><td>Seabed disturbance and deposits</td><td>
Subject to the final decommissioning approach of the WHPS, it may be removed by the rig at the time the well is plugged and abandoned or if this is not feasible, it would be removed following well plug and abandonment using a CSV or DSV. Even in the event the WHPS is removed by the rig, a CSV or DSV would be required to remove the WHPS ceiling panel, and for the disconnection of the spool and umbilical jumper.<br><br>
The disconnection of the spool and umbilical jumper may initially require the repositioning of up to 11 concrete mattresses (dimensions 3x6m). These mattresses would not be recovered at this time but left on the seabed to be recovered as part of the wider Grove field decommissioning. It is estimated that this would generate up to 0.0008km$^2$ of seabed disturbance immediately above and adjacent to the spools/jumpers. The WHPS is conductor mounted such there are no piles connecting to the seafloor that would need to be cut, and no excavation will take place. The WHPS does have four drop-down leg extensions at each corner that were deployed on installation. It is not anticipated that these have substantially penetrated the seabed. They will be cut externally and will fall to the seabed for subsequent recovery in a workbasket. A minor quantity of swarf will be generated by cutting the steel legs, which has been estimated as up to 6kg per leg, or 24kg in total. Based on the density of the steel, a volume of up to 0.003m$^3$ could be generated, with an area of 0.3m$^2$ based on a deposition thickness of 1cm.<br><br>
The seabed disturbance associated with the removal of the WHPS, including the drop-down leg placement and the seabed and recovery, is estimated to be in the order of 0.001km$^2$.<br><br>
Should the rig be used to remove the WHPS, its siting would generate a further 0.013km$^2$ of disturbance, which would in any case occur during well plug and abandonment. Any disturbance from final well abandonment, i.e. the removal of the conductor to 3m below seabed, would be within the footprint of disturbance calculated for the WHPS removal. There may be a requirement for rig stabilisation which would take the form of deposited rock. This would be a maximum of 1,500 tonnes with a seabed area of ~0.0015km$^2$.
<table>
<tr><th>Activity</th><th>Area of temporary disturbance (km$^2$)</th><th>Area of permanent seabed disturbance (km$^2$)</th></tr>
<tr><td colspan="3">WHPS Removal</td></tr>
<tr><td>Mattress relocation</td><td>0.0009</td><td>-</td></tr>
<tr><td>Drop down leg placement</td><td>0.00004</td><td>-</td></tr>
<tr><td>Workbasket placement</td><td>0.00004</td><td>-</td></tr>
<tr><td>WHPS removal</td><td>0.0001</td><td>-</td></tr>
<tr><td colspan="3">Rig Placement</td></tr>
<tr><td>Spud can placement and anchoring</td><td>0.013</td><td>-</td></tr>
<tr><td>Contingent rig stabilisation material</td><td>-</td><td>0.0015</td></tr>
<tr><td>Swarf from cutting legs</td><td>-</td><td><0.000001</td></tr>
</table>
</td><td>
Seabed disturbance will be assessed further in the environmental permits submitted to OPRED in advance of any works taking place.<br><br>
No explosives will be used and seabed disturbance will be minimized as far as possible. Vessels will be positioned using dynamic positioning wherever possible, however, the rig will use anchors for positioning.<br><br>
An as-left survey will be undertaken following completion of the WHPS removal and well decommissioning. A pre-decommissioning survey, and a post-decommissioning debris survey and seabed verification, will be undertaken as part of the full Grove area decommissioning.
</td></tr>
</table>

| | | |
|---|---|---|
| | **Total** | |
| Total for all activities | 0.014 | 0.0015 |

Notes: Assumes that the removal of the WHPS and drop-down legs is equivalent to the total area of these items plus a 1m buffer. It is assumed that the drop-down legs would be recovered in a workbasket. The area of disturbance from the mattresses has been doubled to account for their lifting and replacement adjacent to the spool and umbilical jumper. Any disturbance related to the disconnection activities would be within the area covered by the mattress relocation, or the removal of the WHPS, and the buffers relating to these.

While some marine growth may be removed offshore to allow access, the majority of the material will not be removed or deposited on the seabed. The amount of marine growth on the structure has been conservatively estimated to be 15Te, and it is anticipated that a maximum of 1Te could be removed to allow access. The marine growth is mainly plumose anemones and hydroids – all soft growth which will disperse widely and not accumulate in one area.

The majority of the seabed disturbance associated with the recovery of the WHPS, and well plug and abandonment, is temporary in nature and recovery would be expected to be rapid in view of the prevailing high energy seabed environment. A small area of seabed will be subject to permanent habitat change in view of the seabed sediments present in the Grove area (silty sand). Previous surveys have not indicated the presence of habitats of conservation concern, and the well is some distance from the nearest conservation sites designated for seabed habitats (North Norfolk Sandbanks and Saturn Reef SAC, 19km, Markham's Triangle MCZ, 17km), or any other conservation site (e.g. Southern North Sea SAC) where seabed habitats have a key functional role.

**Physical presence - other users of the sea**

The rig, DSV/CSV vessel will create temporary and short-term increment to other vessels in the area. Fisheries activity in the area is moderate to low, and shipping density across Block 49/10 is moderate, though it is concentrated around gas facilities and cargo and tanker shipping routes to the east, south and north of Grove. The operations will be carried out within the existing 500m safety zone of the Grove G5 well, and the operations are within an area of existing oil and gas associated shipping movements and decommissioning will represent a small increment to existing traffic. Effects on the activity of other users of the sea is not likely.

The rig and vessels used as part of the subsea decommissioning works will be located within the existing 500m safety zone. A consent to locate application will be submitted for the rig, and all appropriate notifications to mariners will be made for the rig and CSV/DSV (if required).

**Energy use and atmospheric emissions**

Atmospheric emissions will be generated by a rig, anticipated to be the *Well-Safe Protector,* and a CSV or DSV, though should the WHPS be removed by the rig, some CSV/DSV days may not be needed. These have the potential to impact local air quality or contribute to global atmospheric greenhouse gas loading (e.g. see BEIS 2022). The following emissions have been estimated based on the metrics in DECC (2008) and Forster *et al*. (2021), and a range of assumptions on rig and other vessel timing.

Should a rig be used to complete the subsea operations and well abandonment, the total fuel use associated with the decommissioning is estimated to be ~398 tonnes of diesel (includes rig, supply, and support vessels, and the possibility that a CSV or DSV may need to move concrete mattresses in advance of rig arrival), and 5 tonnes of helifuel. Estimated atmospheric emissions are as follows:

| | $CO_2$ | $N_2O$ | $CH_4$ | $SO_2$ | CO | $NO_x$ | VOC |
|---|---|---|---|---|---|---|---|
| Emissions Factor (diesel) | 3.22 | 0.00022 | 0.00018 | 0.004 | 0.0157 | 0.0594 | 0.002 |
| Total Mass (tonnes) | 1,296 | 0.09 | 0.07 | 1.6 | 6.29 | 23.7 | 0.81 |

The scheduling of works will, as far as possible, seek to minimise time and emissions through synergies with wider programmes of work. Vessels will be managed in accordance with Spirit Energy's Marine Assurance Standard and will be managed such that durations are minimised, and on-board operational practices address fuel efficiency. It is anticipated that emissions will be negligible, however the impacts will be further assessed in the environmental permits submitted to OPRED.

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| Emissions Factor (helifuel) | 3.15 | 0.0001 | 0.0004 | 0.0009 | 0.0095 | 0.012 | 0.0031 |
| Total Mass (tonnes) | 14.5 | 0.001 | 0.002 | 0.004 | 0.044 | 0.055 | 0.014 |
| GWP | 1 | 273 | 29.8 | - | - | - | - |
| $CO_2$eq. Emissions (tonnes) | 1,239 | 23 | 2.09 | - | - | - | - |
| Total $CO_2$eq. emissions (tonnes) | 1,323 | | | | | | |

Notes: fuel use assumptions: rig, 31 days at 8t/d, support 31 days at 0.84t/d, supply, three trips per week totalling ~11 days of time at 8.5t/d, helicopter two trips per week at 0.6t/trip of helifuel. *In the event that a CSV or DSV remove the WHPS in advance of the arrival of the rig, this would reduce the total rig related emissions by ~160t$CO_2$eq, based on the operation taking 5 days.

For the removal of the WHPS ceiling panel and spool/umbilical, disconnection, and in the event that a CSV or DSV is used to complete the WHPS removal (taking a total of 8 days), this would result in the use of an estimated to be 96 tonnes of diesel.

| | **$CO_2$** | **$N_2O$** | **$CH_4$** | **$SO_2$** | **CO** | **$NO_x$** | **VOC** |
|---|---|---|---|---|---|---|---|
| Emissions Factor (diesel) | 3.22 | 0.00022 | 0.00018 | 0.004 | 0.0157 | 0.0594 | 0.002 |
| Total Mass (tonnes) | 309 | 0.02 | 0.02 | 0.38 | 1.51 | 5.7 | 0.19 |
| GWP | 1 | 273 | 29.8 | - | - | - | - |
| $CO_2$eq. Emissions (tonnes) | 309 | 5.77 | 0.52 | - | - | - | - |
| Total $CO_2$eq. emissions (tonnes) | 315 | | | | | | |

The total emissions from the proposed operations are considered negligible (up to 0.01%) in comparison to total OEUK Exploration and Production (E&P) figure for 2023 which was 13.5 million tonnes $CO_2$eq., and negligible (up to 0.0004%) in comparison to provision UK emissions in 2024, which were 371 million tonnes $CO_2$eq. Spirit recognises the UK Government commitment to reach net zero emissions by 2050, the revised OGA Strategy which came into force in 2021 that included net zero has part of the Central Obligation, and NSTA's Stewardship Expectation 11 (SE11) on Net Zero. Spirit is therefore committed to aligning with SE11 and the NSTA's Decommissioning Strategy when undertaking decommissioning. The scope of work is of short duration, minimising as far as possible atmospheric emissions, and the scheduling of works will, as far as possible, seek to minimise time and emissions through synergies with wider programmes of work. There is no alternative re-use potential for the WHPS, such that it will be returned to shore for recycling.

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| **Discharges** | The umbilical jumper and pipeline spool will be disconnected prior to the WHPS being removed. The chemical lines of the jumper contain a quantity of methanol, corrosion inhibitor, and hydraulic fluid. Options are being considered on how the contents of the chemical lines may be recovered, with a base case to recover as much as possible. In the event that recovery of the chemicals is not possible, their contents may be discharged. Due to hydrostatic pressure, an initial, small discharge would be expected, with the full contents being discharged over time. The hydraulic fluid is expected to dissipate from the area (overall quantities will be relatively small and these will be one-off and final discharges from the line). Should any discharges occur, they will contribute to local water quality changes and have associated interactions with water column and benthic biota. Significant effects not likely. | Discharges will be minor and options for chemical recovery will be considered further in the permitting and consenting process for the activities. |
| **Underwater noise** | The main contributor to underwater noise from the activities will be vessel activity; explosives will not be used, however, the legs of the WHPS will be mechanically cut, for example, using a diamond wire saw. The primary receptor of noise impacts are marine mammals, however, the Grove G5 well is not located in an area of particular importance for marine mammals and is some distance from the nearest conservation sites designated for marine mammal features (closest is the Southern North Sea SAC, 8km to the west). The density of grey and harbour seals in the area is expected to be very low given the distance to the nearest colonies and associated conservation sites in UK waters (at least 136km).<br>The increased vessel activity associated with decommissioning will add to the overall ambient noise in the wider area, however, noise characteristics are such that injury will not occur to marine mammals, fish or birds, and will be temporary (up to 29 days which would also include the well P&A). Sound from the rig or vessels may result in some temporary influence on the behaviour of individual marine mammals within the vicinity of the operations (Wisniewska et al. 2018, Erbe et al. 2019), however, such effects will be short-term, localised to within a few hundred metres of the vessel, and in the context of existing levels of shipping activity in the region. Available sound measurements of a diamond wire cutting operation in the North Sea (Pangerc et al. 2016) indicated that the sound radiated at the time of cutting was not easily discernible above that of background noise, i.e. the vessels associated with the operation. Consequently, effects on noise sensitive receptors are not likely. | The scheduling of works will, as far as possible, seek to minimise time in the field through synergies with wider programmes of work. Vessels will be managed in accordance with Spirit Energy's Marine Assurance Standard and will be managed such that durations are minimised. Underwater noise will be minor and incremental to wider shipping in the area and no mitigation is considered necessary. |
| **Generation of waste materials** | The waste generated as part of the removal will be primarily steel (42.7 Te) that will be recycled, along with small amount of marine growth (a maximum of 15 tonnes, noting up to 1 tonne may be removed offshore). Limited amounts of hazardous waste are anticipated as part of the project, and these will be managed by an appropriately licenced facility. The overall significance of the impact of waste as a result of the project is considered to be low. The WHPS will be taken ashore and recycled at a licenced facility and incremental effects onshore are not considered to be likely. | The waste hierarchy will be followed and only if other options are not possible will waste material be sent to landfill. Spirit will comply with relevant UK or EU waste legislation and the requirements of duty of care. The selected receiving port and waste handling facility will be able to demonstrate a proven disposal track record and waste stream management throughout the process. |
| **Accidental events – release of hydrocarbons** | A spill of hydrocarbons is highly unlikely during the proposed operations as the well is isolated and the hydrocarbons produced from the G5 well were almost entirely gas. The volume of condensate production over field life has been small, making up a very small proportion (<5%) of overall production. There is a minor potential for incremental unplanned release of diesel from vessels or the rig, however, preventative measures and response (OPEP, SOPEP) will be in place. Grove is included in the Greater Markham Area OPEP which is informed by a consideration of major accident hazards. | Any vessel used will have a Shipboard Oil Pollution Emergency Plan (SOPEP) in place, and the risk of accidents will be minimised by appropriate ship lighting and marking, and notices to mariners. A Vessel |

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| | A Major Environmental Incident (MEI) is defined in the Safety Case Regulations 2015 as an incident "which results or is likely to result in significant adverse effects on the environment in accordance with the Environmental Liability Directive (ELD) 2004/35/EC of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage". "Significant adverse effects" may include severe regional impact, leading to long term/irreversible damage (including poor potential for recovery) to a very large area of internationally or nationally protected populations, habitats and/or sites.<br><br>It is noted in the OPEP that, "*...the specific gravity of the condensates associated with GMA range between 0.739 and 0.77 indicating that they are likely remain afloat on the sea surface. Condensates generally have very high levels of light ends which evaporate quickly upon release. Lower asphaltene content prevents emulsification thus reducing its persistence in the marine environment. Due to the characteristics and subsequent behaviour when released, condensates, such as those associated with the Greater Markham Area, are not considered to offer a significant threat to the environment."*<br><br>No major accident hazards have been identified that could lead to a well blow out for either well or any release from the wells that could release hydrocarbons in sufficient quantity or type to cause significant adverse change to a protected species or habitat.<br><br>Additionally, there is a small incremental risk of spills from the rig of chemicals, however these are not considered to be significant and/or likely to occur.<br><br>In addition to the rig, a vessel will be used for the initial subsea scope of work, and potentially for the recovery of the WHPS. There is an existing 500m subsea exclusion zone at the well location, and the vessel will be on location under Dynamic Positioning and will be able to move off station quickly. In addition, it is a short duration campaign, being up to 8 days. Therefore, overall, the potential for collision is very low. | Traffic Survey and Collision Risk Assessment will be undertaken. The work will take place within a long-established 500m subsea safety zone, limiting potential interactions with other users, and in particular fisheries.<br><br>As part of the OPEP, specialist oil spill management and response services will be in place, to minimise impacts from potential releases to the marine environment. |
| **Cumulative effects** | The Grove G5 well will be permanently plugged and abandoned once the WHPS has been removed. While well decommissioning does not form part of this DP, cumulative effects from this activity are considered below. A jack-up rig, anticipated to be the *Well-Safe Protector*, will be used to plug and abandon the well. The Grove G5 well is within an established area of gas field activity and the presence of the rig will not add significantly to vessel traffic in the area.<br><br>Similarly, while the rig will result in underwater noise, sound pressure levels from such rigs (Todd & White 2012) are not expected to be greater than that from support and supply vessels (OSPAR 2009), or wider vessel traffic, and any cutting is unlikely to be generate noise significantly discernible above that of the rig/vessels. While some wider activity in the region is likely to produce significant impulsive underwater noise (e.g. installation of the Hornsea Project Three wind farm), cumulative effects are not considered to be likely as well and subsea decommissioning activities at Grove do not involve such high amplitude sounds, are temporary, and negligible in the context of wider vessel traffic in the area.<br><br>The seabed disturbance from rig placement has been calculated as part of the disturbance associated with the WHPS removal, as the rig may be used to remove it. Other sources of physical disturbance in the area include wind farm installation (Hornsea Project Three, 3km to the west) and fisheries, however, effort appears to be moderate to low, with crabs dominating landings, with squid and *Nephrops* forming a much smaller proportion. Significant cumulative effects are not considered to be likely as the disturbance associated with the decommissioning of the WHPS, and the Grove well, is small and mostly temporary, and does not take place within a conservation site with habitats or species sensitive to disturbance.<br><br>Atmospheric emissions are from the rig and vessels and are small in a national context and also within wider UKCS | The rig and any vessel will be located within the existing 500m safety zone, and the location and timing of the activities will be subject to notices to mariners.<br><br>Cumulative effects of disturbance will also be considered as part of the permitting and consenting process for the decommissioning activities. |

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| | oil and gas activities, and those from domestic shipping and the UK's share of international shipping (~0.014% of emissions in 2023, after DfT 2025). They will be minimised, as far as possible, through synergies in rig and vessel use with other programmes of work.<br>The only discharges from the WHPS removal are related to the disconnection of the umbilical jumpers, which relate to a small amount of methanol, corrosion inhibitor and hydraulic fluid. Other discharges may be associated with well plug and abandonment, including of chemicals or an aborted cement discharge, however the nature of these potential discharges is not known at this time, and they will be subject to a chemical permit. | |
| **Transboundary effects** | While the Grove G5 well is relatively close to the UK/Netherlands median line (7km), however, activities associated with decommissioning considered to offer a remote risk of transboundary effects. | As part of the permitting and consenting process for the decommissioning activities, accidental events and a major environmental incident assessment will be carried out, which will take into consideration the potential for transboundary impact. |

The Grove G5 well is located within an area covered by England's East Marine Plans (HM Government 2014). The process to replace these plans, which were adopted in 2014, has commenced with the publication of a draft Statement of Public Participation. Consultation on the revised marine plans is expected to take place in Autumn 2025. In the meantime, the policies of the current East Inshore and East Offshore Marine Plans remain relevant. Spirit is aware of the plan polices of relevance to the proposed activities, these being considered in Table 4.2.2 below.

Table 4.2.2 Marine Plan Policies

| Policy and topic | Assessment |
|---|---|
| **BIO1 (biodiversity protection)** | The CSV/DSV will be under DP and not use a mooring system, therefore there will be no interaction with the seabed from the physical presence of the vessel, however, some seabed disturbance will be generated by the potential movement of mattresses, the removal of the WHPS, and rig. The well and any area of disturbance associated with it, is not located within a designated area. No explosives, or other impulsive noise sources, are to be used resulting in no concern for noise sensitive species, including marine mammals.<br><br>Available survey data from Grove does not reflect the presence of species or habitats of conservation concern. |
| **CC2 (minimise emissions of greenhouse gases)** | The decommissioning activities will lead to emissions of gases from vessel/rig engine use, which will contribute to localised and short-term increases in atmospheric pollutants, and to global atmospheric GHG concentrations.<br><br>The scheduling of works will, as far as possible, seek to minimise time and emissions through synergies with wider programmes of work. Vessels will be managed in accordance with Spirit Energy's Marine Assurance Standard and will be managed such that durations are minimised, and on-board operational practices address fuel efficiency. It is anticipated that emissions will be negligible |
| **ECO1 (cumulative impacts)** | Cumulative effects are not anticipated. The spatial and temporal footprint of the work is very small, and restricted to an existing 500m safety zone, such that there will be no incremental exclusion as a result of the activities taking place.<br><br>Disturbance will be incremental with decommissioning and other activities generating physical disturbance and noise (e.g. wind farm installation) at a regional scale, however, the small temporal and spatial scope of the work, distance from other activities, and lack of interaction with conservation sites are such that cumulative effects are not considered to be likely.<br><br>No significant incremental effects from emissions on air quality are considered possible, given the scale of inputs and high rates of dispersion available, and overall GHG emissions are minimised as far as possible through project scheduling. |
| **ECO2 (collision risk)** | A rig will be used for well plug and abandonment, and potentially the removal of the WHPS, and a vessel will be used to disconnect the spool and umbilical jumper, and potentially to remove the WHPS. There is an existing 500m safety zone in place at Grove 5.<br><br>A vessel traffic survey will be carried out to inform the well P&A campaign including where the rig is used for the removal of the WHPS, and will inform the permit applications for the activities |
| **FISH1 (fishing)** | The work will be undertaken within a long established 500m safety zone, and incremental displacement effects on fisheries are not considered likely. |
| **FISH2 (fish spawning & nursery grounds)** | Several species have reported fish spawning and nursery grounds in the area. Impact on the spawning grounds of these is not expected, given the very small spatial footprint of the activities and the wider area used by |

| | |
|---|---|
| | these species to spawn. This is similar to nursery grounds; the spatial footprint of the activities is small and not expected to impact on nursery grounds. |
| **CCS1 (carbon dioxide storage)** | The approach to decommissioning will not prevent future carbon dioxide storage in the area. |
| **DEF1 (proposals in defence areas)** | While Grove is within a military PEXA, it is not in an area where policy DEF1 applies, and there are no MoD special conditions related to Block 49/10. |

*Notes: [1]Policies considered of relevance included in table, those not considered applicable for the activities being proposed are not included here. Source: HM Government (2014)*

A number of policies are not considered to be relevant because there is no potential for interaction for the topics they cover, which include those covering ports and shipping (PS1, 2 and 3) aggregates (AGG1, 2 and 3), subsea cables (CAB1), tourism and recreation (TR1 and TR2) and renewables development (WIND1, TIDE1). Policy CC1 is not considered to be relevant as the potential effects of climate change on the wider Grove area within the timeframe of the works covered by this DP and wider Grove area decommissioning, are not expected to be significant, and the proposed approach to decommissioning will have no impact on any climate change adaptation measure.

# 5. INTERESTED PARTY CONSULTATIONS

## 5.1 General

| Table 5.1.1 Summary of Stakeholder Comments | | |
|---|---|---|
| **Who** | **Comment** | **Response** |
| **STATUTORY CONSULTATIONS** | | |
| **NSTA** | Spirit Energy Resources Limited has consulted with NSTA under S29 (2A) of the Petroleum Act. | |
| **NFFO** | [HOLD] | |
| **NIFPO** | [HOLD] | |
| **SFF** | [HOLD] | |
| **GMG** | [HOLD] | |
| | | |
| **Public** | [HOLD] | |

# 6. PROGRAMME MANAGEMENT

## 6.1 Project Management and Verification

Spirit Energy's project management team will manage the operations of competent contractors selected for all decommissioning activities. The team will ensure the decommissioning is executed safely, in accordance with legislation and Spirit Energy Health and Safety principles. Required changes to the DP will be discussed with OPRED, with any necessary approvals sought.

## 6.2 Post-Decommissioning Debris Clearance and Verification

This DP covers removal of the WHPS/Xmas tree as part of the Grove West well (Grove G5) decommissioning campaign. Upon completion, an as-left survey will be carried out to ensure that no snag hazards or risks to other users of the sea remain. Any items left *in-situ* until the wider Grove field decommissioning[2] is complete will be monitored and appropriate mitigation put in place. Post- decommissioning debris surveys and seabed verification will be carried out after full decommissioning of the Grove field infrastructure.[2]

## 6.3 Schedule

The proposed schedule for the decommissioning of the Grove West WHPS/Xmas tree is provided in Figure 6.3.1.

The activities are subject to the acceptance of the DP presented in this document and any unavoidable constraints (e.g. vessel availability) that may be encountered whilst executing the decommissioning activities. Therefore, activity schedule windows have been included to account for this uncertainty. The WHPS removal activities will not be performed unless there is a rig contract and agreed execution schedule window in place for the well P&A.

The commencement of wider offshore decommissioning activities will depend on commercial agreements, commitments and timelines. Spirit Energy will also examine the possibility of including the offshore work in a wider campaign of subsea works to reduce costs.

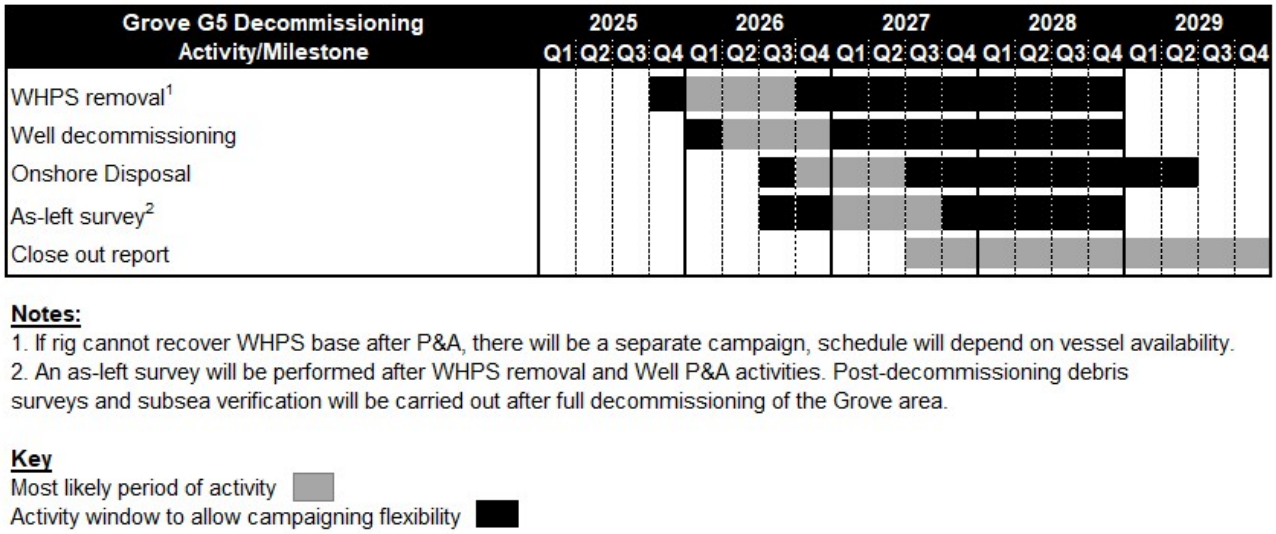


*Figure 6.3.1 Gantt Chart of Project Plan*

[2] A separate DP document will be submitted to OPRED in due course with the decommissioning proposals for the remaining wider Grove field infrastructure.

## 6.4 Costs

Decommissioning costs will be provided separately to OPRED and NSTA in confidence.

## 6.5 Close Out

In accordance with the OPRED Guidelines, a close out report will be submitted to OPRED within 12 months of the completion of the scope within this Decommissioning Programme.

## 6.6 Post-Decommissioning Liability, Monitoring and Evaluation

This Decommissioning Programme concerns the removal of the WHPS and the associated Grove G5 Xmas tree. Following completion of the wider Grove field decommissioning scopes (to be covered by a separate future Decommissioning Programme document to be submitted to OPRED) the various survey findings specific to this Grove G5 WHPS DP (i.e. as-left status, environmental and clear seabed surveys) will be sent to OPRED in a standalone Grove G5 WHPS close out report. The frequency of future surveys will be agreed with OPRED and supported with a risk assessment.

Residual liability for the facilities will remain with the Section 29 holders. Unless agreed otherwise in advance with OPRED, Spirit Energy will remain the focal point for this matter including any change in ownership, for example.

## 7. SECTION 29 NOTICE HOLDERS LETTERS OF SUPPORT

[HOLD]

## 8. REFERENCES


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# 9. APPENDIX A

## 9.1 PUBLIC NOTICES

[HOLD]