Dunlin Alpha EIA Scoping Report

Fairfield Energy

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Contents

1. Introduction

1.1. Project background

Fairfield Betula Limited (Fairfield) is the operator of the Dunlin, Osprey and Merlin fields, located in United Kingdom Continental Shelf (UKCS) Blocks 211/23 of the northern North Sea. Infrastructure associated with Dunlin, Merlin and Osprey are currently being prepared for decommissioning. The Dunlin field lies approximately 137 km from the nearest landfall point, 196 km north east of Lerwick and 508 km north east of Aberdeen. The field sits 11 km from the UK/Norway median line and in a water depth of approximately 150 m (Figure 1.1). The Osprey field is a subsea tie-back located 6 km to the north-north west of the Dunlin Alpha platform and the Merlin field is a subsea tie-back located 7 km to the west-north west of the Dunlin Alpha platform. Production at the fields ceased in 2015 and Fairfield now intend to decommission the Dunlin Alpha platform as part of a wider programme to also decommission the associated Merlin and Osprey subsea tie-backs. An overview of the Dunlin Alpha platform and associated tie-backs is shown in Figure 1.2. Following extensive stakeholder engagement to date that has covered all three of the Dunlin, Merlin and Osprey fields, Fairfield has identified a need to engage with a wider audience on the decommissioning activities planned specifically for Dunlin Alpha in order to solicit feedback on the proposed activities and the next steps in the Environmental Impact Assessment (EIA).

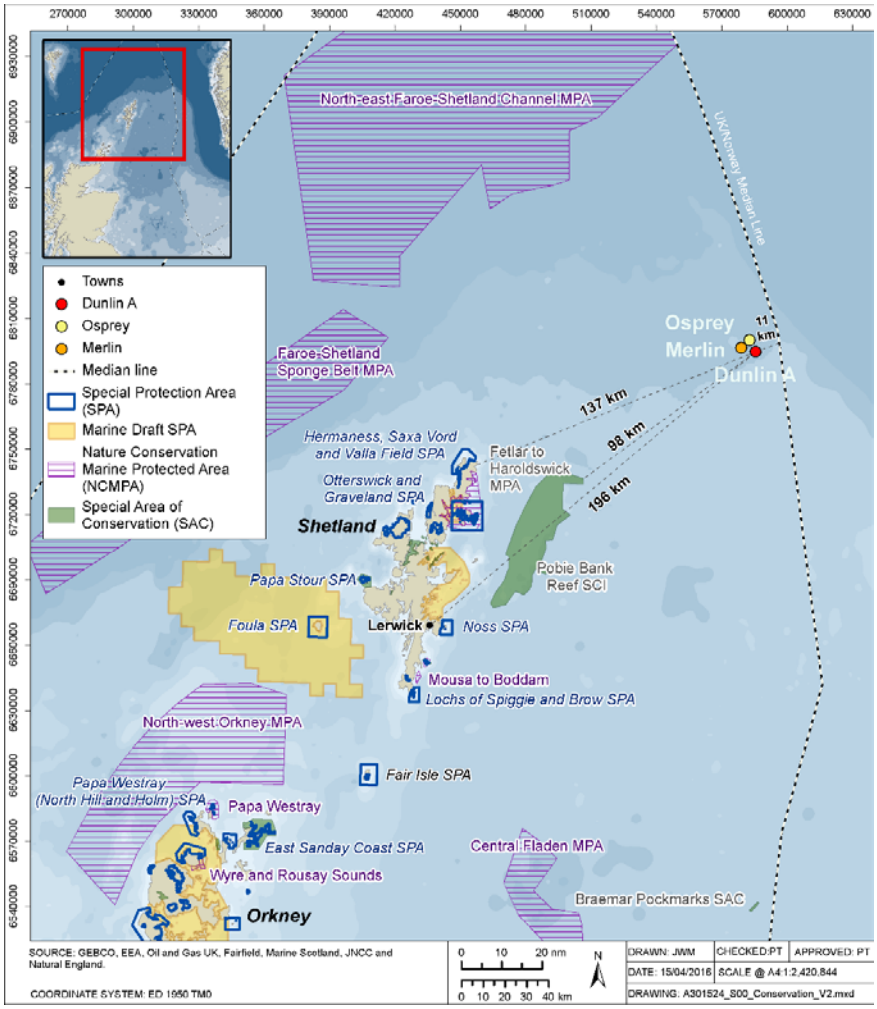

Figure 1.1 Location of Dunlin, Merlin and Osprey

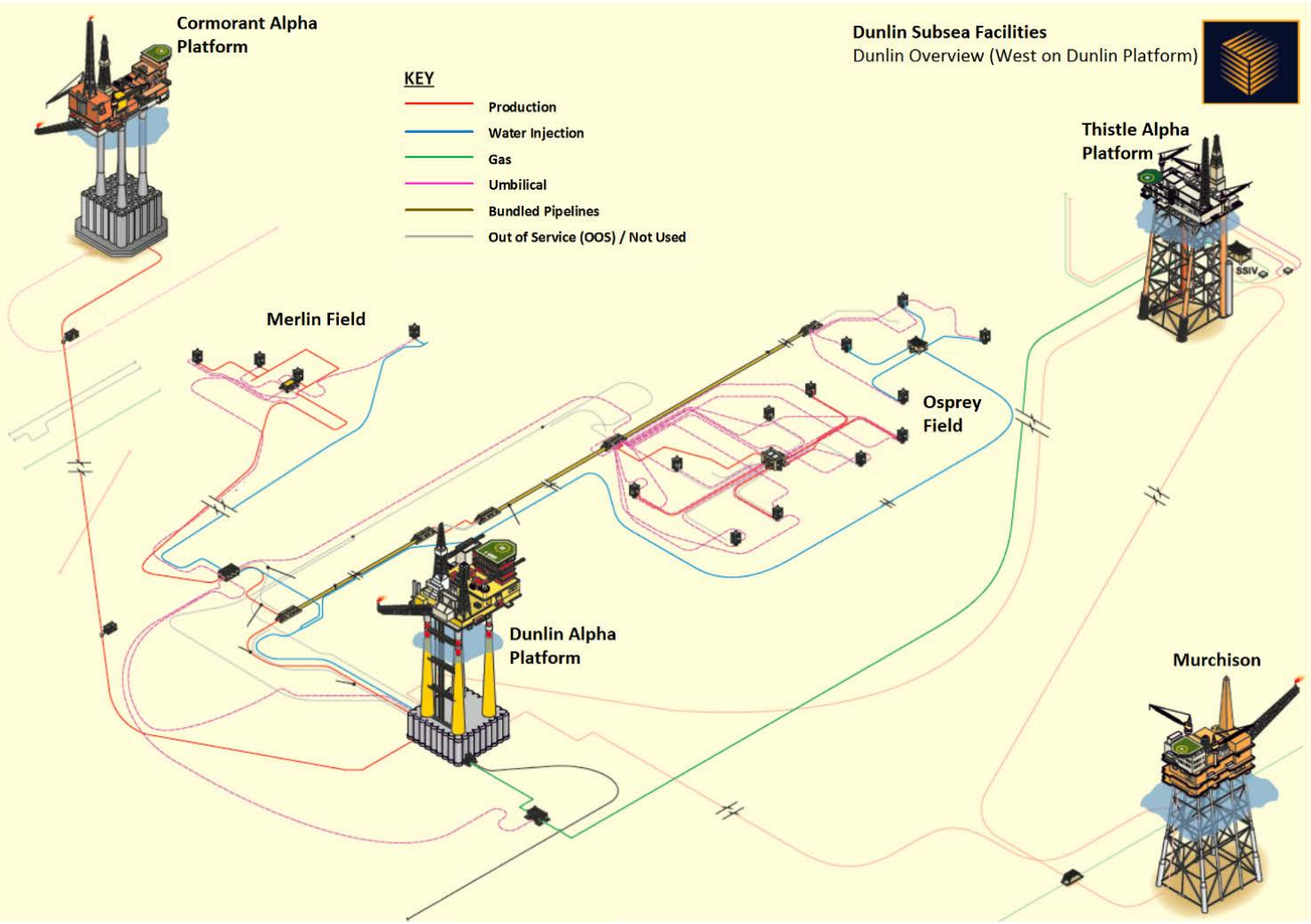

Figure 1.2 Dunlin field layout

1.2. Dunlin area

The Dunlin field was discovered by Shell UK in 1973 and the Dunlin Alpha platform subsequently installed in 1977; production from the field commenced in 1978. The Dunlin Alpha platform, shown in Figure 1.3, is a four leg, concrete gravity base (CGB) sub-structure with a steel box girder based topsides supporting two further levels. Dunlin Alpha stands in 151 m of water at latitude 61° 16' 30" N and longitude 01° 35' 51" E, 196 km north east of Lerwick. Before production ceased in 2015, there were sixteen active production wells and three active injection wells. Prior to cessation of production, hydrocarbons from the Osprey and Merlin fields were transported to Dunlin Alpha by pipeline for processing at a dedicated module. Dunlin Alpha also continues to act as an export hub for crude oil from the Thistle field which, after historically being combined with production from the Dunlin cluster and Murchison field, are exported via the Dunlin/Cormorant export pipeline (note that, as detailed in Section 2.3, decommissioning of this process is outwith the scope of the EIA).

Figure 1.3 Dunlin Alpha platform

1.3. Regulatory and policy background

The decommissioning of offshore oil and gas installations and pipelines on the UKCS is controlled through the Petroleum Act 1998, as amended by the Energy Act 2008. Decommissioning is also regulated under the Marine and Coastal Act 2009 and Marine (Scotland) Act 2010. The UK's international obligations on decommissioning are primarily governed by the 1992 Convention for the Protection of the Marine Environment

of the North East Atlantic (the OSPAR Convention). The responsibility for ensuring compliance with the Petroleum Act 1998 rests with the Department of Business, Energy and Industrial Strategy (BEIS). BEIS is also the Competent Authority on decommissioning in the UK for OSPAR purposes and under the Marine Acts.

Agreement on the process to be applied to the decommissioning of offshore oil and gas installations within the Convention area, and hence within the UKCS, was reached at the OSPAR Commission meeting held in July 1998. That agreement was reflected in OSPAR Decision 98/3, which entered into force on 9 February 1999 and which brought a prohibition on the dumping and leaving wholly or partly in place of offshore oil and gas installations. However, following assessment, a country's Competent Authority may give permission to leave installations or parts of installations in cases outlined in Table 1.1.

Table 1.1 Cases where permission may be granted to leave an installation *in situ*

Case	Applicable to Dunlin Alpha?
Steel installations weighing more than 10,000 tonnes	×
Gravity-based concrete installations	✓
Floating concrete installations	×
Any concrete anchor-base removal of which results, or is likely to result, in interference with other legitimate uses of the sea	×

If an installation falls within the derogation categories and the decommissioning party is considering possible derogation then a detailed assessment of the alternative disposal options must be carried out. This process of due consideration is called 'Comparative Assessment' and is currently being progressed by Fairfield for Dunlin Alpha (further information is provided in Section 3.1.2).

At present in the UK there is no statutory requirement to undertake an EIA to support the Decommissioning Programme that must accompany all applications for decommissioning in the UKCS (as per the Petroleum Act 1998). However, BEIS in its adopted (formerly DECC's) 'Guidance Notes on the Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998' advise that the Decommissioning Programme must be supported by an EIA. In this regard, the BEIS Guidance Notes state that an EIA should include an assessment of the following:

- All potential impacts on the marine environment including exposure of biota to contaminants associated with the installation; other biological impacts arising from physical effects; conflicts with the conservation of species and their habitats;
- All potential impacts on other environmental compartments, including emissions to the atmosphere, leaching to groundwater, discharges to surface fresh water and effects on the soil;
- Consumption of natural resources and energy associated with reuse and recycling;
- Interference with other legitimate uses of the sea and consequential effects on the physical environment; and
- Potential impacts on amenities, the activities of communities and on future uses of the environment.

In addition, BEIS has advised the oil and gas industry that any applications related to decommissioning made under the Marine and Coastal Act 2009 and Marine (Scotland) Act 2010 will need to be supported by an EIA. Although such applications are not being made by Fairfield at this time (they will be required later in the

decommissioning process), Fairfield proposes to undertake the EIA to adequately support such applications when they are eventually required.

1.4. Purpose of this EIA scoping report

This EIA scoping report has been prepared by Fairfield to gather input from stakeholders on the potential impacts of the decommissioning of the Dunlin Alpha platform. The specific objectives of this EIA scoping report are to:

- Provide an overview of the existing environment in the Dunlin area;
- Provide an overview of the strategy and scope of the decommissioning activities;
- Identify key potential issues;
- Outline the supporting studies that will be required to inform the EIA; and
- Facilitate dialogue with stakeholders regarding key potential issues, potential mitigation and environmental data sources.

1.5. Structure of this EIA scoping report

This EIA scoping report contains the following:

- Section 2 – a description of the strategy and scope of the EIA process;
- Section 3 – an overview of the Project and the proposed decommissioning activities;
- Section 4 – an overview of the environment in the Project area;
- Section 5 – a high-level discussion of the potential environmental impacts and details of the supporting studies likely to be required as part of this EIA; and
- Section 6 – details of the mechanism of response to this EIA scoping report.

Key definitions

Project

This means the decommissioning of the Dunlin Alpha platform, including topsides and CGB.

Project Area

The geographical extent of the Project is limited to the Dunlin Alpha CGB structure and topsides equipment. This is shown in Figure 1.4.

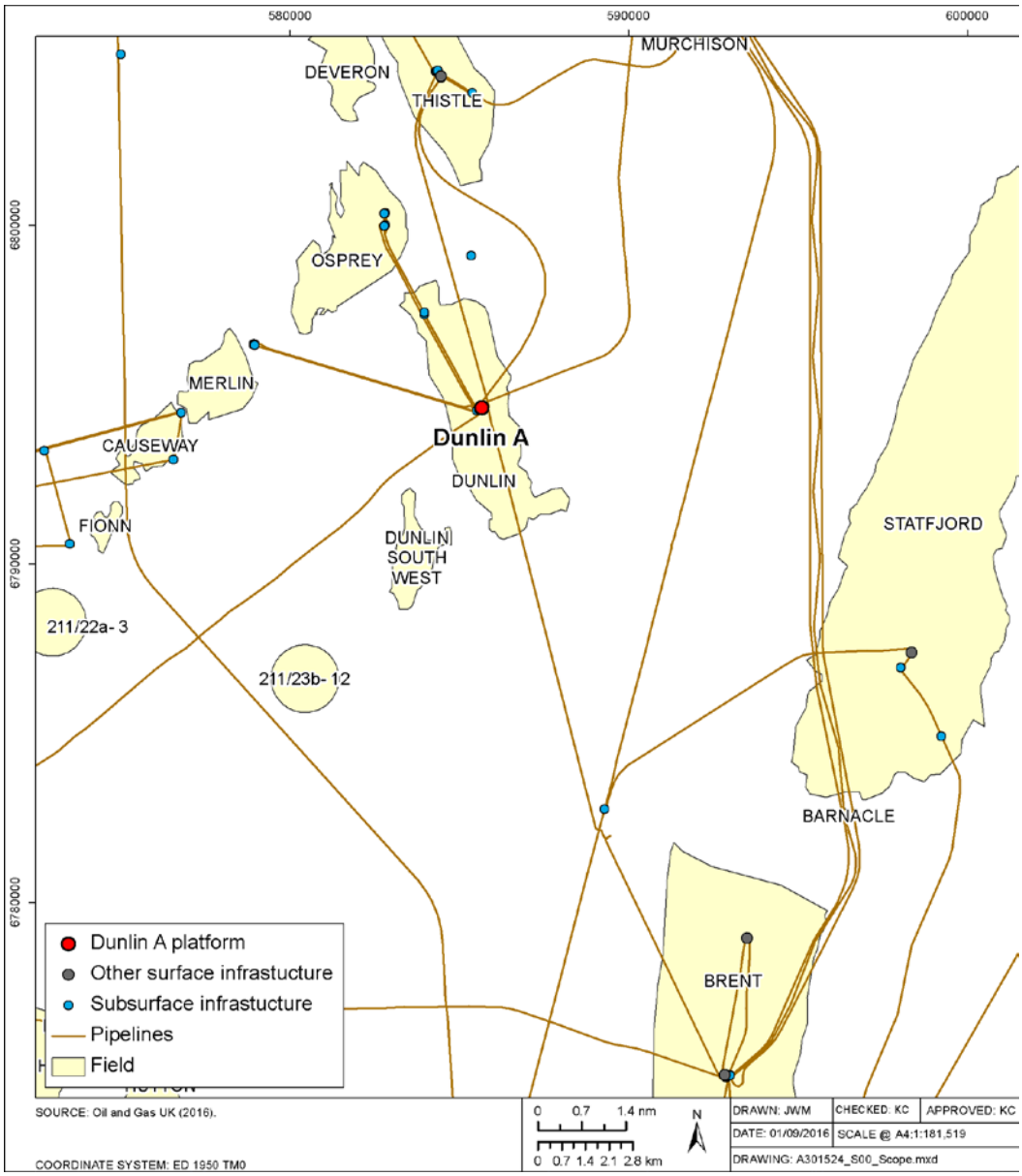

Figure 1.4 Illustration of the infrastructure in the scope of this EIA

2. EIA Strategy and Scope

2.1. The EIA process

During the EIA process, the potential environmental and social impacts associated with the Project will be evaluated and mitigation measures identified and designed to control potentially significant, adverse impacts. The EIA process that this scoping report forms part of will aim to achieve the following:

- Characterise the environmental and social baseline;
- Identify the Project components and alternatives and assess potential impacts;
- Identify and address any stakeholder concerns regarding the proposed decommissioning activities;
- Identify solutions and management control measures that will reduce the potential negative environmental and social impacts;
- Identify potential residual impacts and their significance; and
- Assess potential cumulative, in-combination and transboundary impacts.

2.2. Stakeholder consultation

Communication with stakeholders is a key component of the EIA process. As such, stakeholder engagement for the Project will follow best practice for these activities; this is considered to be the Oil and Gas UK (OGUK, 2013) 'Guidelines on Stakeholder Engagement During Decommissioning Activities'. Consultation will ensure that relevant concerns are incorporated into the Project design and EIA, including agreed mitigation proposals.

There are a number of organisations which will be engaged formally in the Fairfield decommissioning programme, including (but not limited to):

- BEIS
  - BEIS is the Competent Authority for offshore oil and gas operations, and is responsible for approving the decommissioning programme. BEIS acts on behalf of Marine Scotland under the Marine Act (Scotland) 2010 in determining decommissioning programmes.
- Marine Scotland
  - In addition to the above, Marine Scotland is the directorate of the Scottish Government responsible for marine and fisheries issues in Scotland. Marine Scotland must be consulted when proposed activities involve the deposits of substances or articles at sea in waters adjacent to Scotland.
- Joint Nature Conservation Committee (JNCC)
  - The JNCC provides nature conservation advice to BEIS on matters relating to the offshore oil and gas industry and is the primary point of contact for nature conservation advice on decommissioning programmes.
- Scottish Fishermen's Federation (SFF)
  - The SFF plays a key role in representing Scotland's fisheries at national and international levels and frequently advises the offshore oil and gas industry on fisheries aspects of decommissioning programmes.

Fairfield will actively engage with other relevant stakeholders as part of the public consultation process exercise with relevant decommissioning documentation being made available on both the BEIS and Fairfield websites (www.fairfield-energy.com).

2.3. Scope of the EIA

The EIA will include the offshore decommissioning activities associated with the Dunlin Alpha CGB structure and topsides facilities.

The infrastructure included in the EIA is illustrated in Figure 1.4. For avoidance of doubt, infrastructure that is not in the scope of the EIA includes:

- Dunlin Alpha to Cormorant A pipeline is owned by Dunlin Field Group, Thistle Field Group and Murchison Field Group;
- Thistle A to Dunlin Alpha oil pipeline is owned by Thistle Field Group and therefore not Fairfield's responsibility;
- Murchison to Dunlin Alpha oil pipeline, which is owned by Murchison Field Group, has already been decommissioned;
- Subsea infrastructure and corridors associated with the Dunlin Fuel Gas Import Line and Brent C to Dunlin Alpha power cable are the subject of associated but a distinct EIA process for which a separate ES will be submitted; and
- Merlin and Osprey fields, which are the subject of associated but distinct EIA processes and for which separate ESs will be submitted.

3. Project Description

3.1. Dunlin Alpha platform

3.1.1. What is being decommissioned?

The Dunlin Alpha platform base is a 104 m x 104 m CGB structure, and the platform is over 200 m high from the seabed to the top of the highest point on the platform. Figure 3.1 demonstrates the approximate dimensions of the platform as a whole. The square base of the CGB is divided into 81 compartments (cells), with one concrete leg rising 111 m from the top of the cells at each corner. The cells contain a mixture of seawater, hydrocarbon and a variety of inorganic materials. The cells have not been used for separation since 2004. In 2008, trapped oil in the top of the cells (called attic oil) was removed during the Attic Oil Recovery Project making the cells oil free to as low as reasonably practicable (ALARP). Four steel columns constructed from stiffened steel plates extend 31 m from the top of the concrete legs, rising beyond the sea surface to the underside of the topsides deck. These columns are bolted and grouted into the top of the concrete legs.

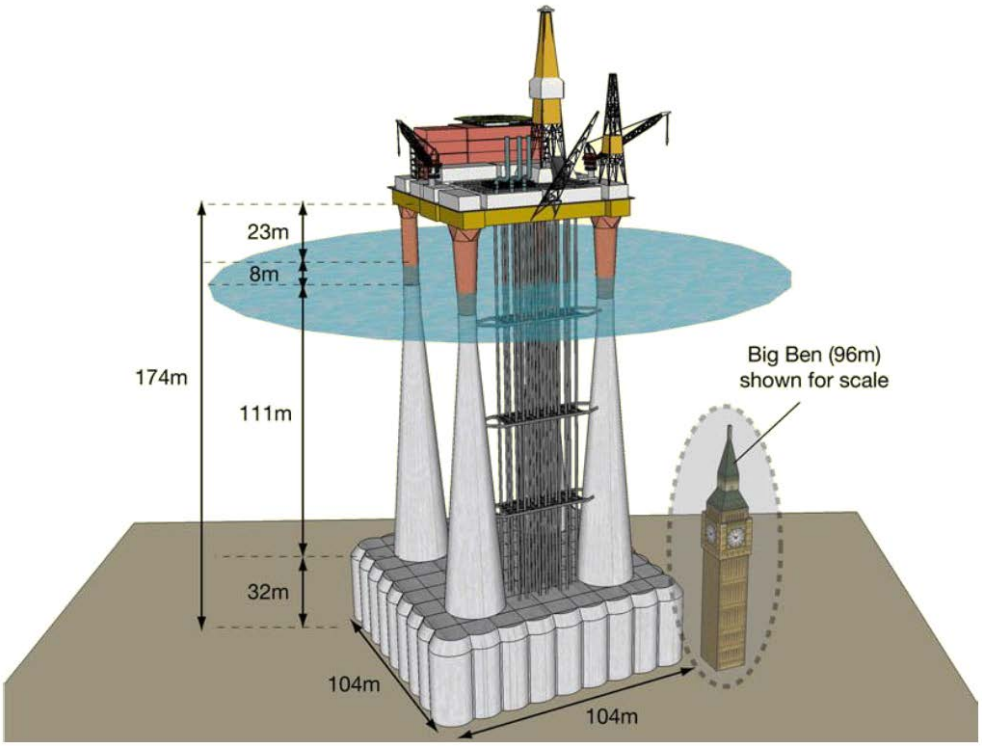

Figure 3.1 Schematic of the Dunlin Alpha platform

The CGB weighs approximately 320,000 tonnes including internal equipment in the legs and solid ballast in the base, whilst the topsides weighs a further 20,000 tonnes. Prior to cessation of production, well fluids passed from the subsurface reservoir inside 45 steel pipes (well completions) up to the topsides on the platform. The topside facilities include equipment associated with:

- Drilling;
- Oil and gas processing and metering;
- Produced water treatment and reinjection;
- Power generation, utility and safety systems;

- Oil export pumping;
- Personnel accommodation for up to 139 people; and
- Helicopter movements (i.e. helideck).

The topsides facilities are contained within three main decks: drilling deck, module deck and lower deck (module support frame). The vast majority of material in the Dunlin Alpha topsides is steel, with remaining components constructed of material such as aluminium, cement and copper. The topsides vessels have been drained down and flushed. Fluids generated during this process were re-injected into the reservoir. Onboard equipment will be subject to further cleaning activities, although it is possible that some residual contents (including hydrocarbons) may remain in the equipment.

3.1.2. How will it be decommissioned?

The reference case in the decommissioning of the Dunlin field is that all topsides and the CGB structure will be removed. As described in Section 1.3, however, the Dunlin Alpha CGB qualifies for consideration for derogation. This means that a Comparative Assessment will be undertaken to assess and select a decommissioning option taking into consideration technical feasibility, safety, environmental and social impacts and economics. Thus, the final selected case may be removal or 'leave *in situ*'. Should the CGB be removed, potential impact mechanisms include the presence of decommissioning vessels, the potential requirement for underwater cutting and the need to interact with the drill cuttings present at the base of Dunlin Alpha (further detail is provided on these cuttings in Section 3.2). Should the Comparative Assessment demonstrate that the structure should remain in place, it is likely that the key potential impact mechanisms would relate to the short-term presence of decommissioning vessels and the long-term presence of the CGB itself. Consideration will also be given to the contents of the CGB cells and any associated potential impacts in any of the decommissioning scenarios being considered in the Comparative Assessment.

For removal of the topsides, suitable lifting vessels would come alongside the platform following completion of preparatory activities (such as cutting of items or addition of structural support) and the topsides would be transferred to the vessels and onwards to shore. Fairfield is currently working towards identifying the specific options for removal of the topsides and the exact mechanism by which topsides removal will occur is not yet known. Removal methods considered in other UK decommissioning projects include 'reverse installation' where the topsides are removed to vessels in the reverse order to which they were installed, 'piece small' where the topsides are cut into sections offshore and lifted onto vessels and 'single lift' where the complete topsides are removed to vessel in one single piece. The Option Selection process will define the various available options (which may also include a hybrid of the above methods), undertake the necessary studies to understand the implications of each option and reach a conclusion on the final option in a fully informed manner and considering the criteria of technical feasibility, safety, potential social and environmental impacts, and economics. Regardless of the selected removal option, the key potential impact mechanisms will be similar, in that vessels will be required on site for an extended period of time.

3.2. Drill cuttings

Drilling operations from 45 wells have taken place at the Dunlin field since the 1970s. There have been discharges of drill cuttings and drilling mud that have caused a drill cuttings pile to form beneath the platform jacket structure at Dunlin Alpha. As the distribution of historical drill cuttings is known to change over time, Fairfield has commissioned benthic survey work to better understand the current status of the cuttings and further define spatial extent. Further detail on study work relevant to drill cuttings is provided in Section 5.

4. Environment Baseline

4.1. Physical environment

4.1.1. Weather and sea conditions

Wind speed in the Project area is generally described as being either a calm to gentle breeze in the range 0 – 6 ms^{-1} or a moderate to fresh breeze in the range 6 – 10 ms^{-1}. Calm winds occur for approximately 31% of the time and moderate winds for 34.5% of the time. Gale conditions occur most frequently during the winter months (October to March) with the percentage of winds at or above Beaufort force 7 in January being greater than 30% (BODC, 1998). The 1-year maximum wind speed over 1 hour is 31.1 ms^{-1} (Fairfield, 2012).

Water masses of the North Sea circulate cyclonically, largely due to mass inflow from the Norwegian Sea, an influx which occurs along the Norwegian Trench at approximately 200 m depth. Water also enters the North Sea through two other routes; from the east of the Shetland Islands and between Shetland and Orkney (OSPAR, 2000) at approximately 100 m depth. These inflows of water are balanced by the outflowing Norwegian Coastal Water mass, which flows predominantly along the Norwegian coast (OSPAR, 2000). Average current velocities at the Project area are 0.5 ms^{-1} at the surface decreasing to 0.2 ms^{-1} near the seabed (Fairfield, 2012). This leads to a depth averaged current speed of 0.46 ms^{-1}.

Wave height ranges in the vicinity of the Project area are from a 1-year significant wave height of 11.5 m to a 1-year maximum wave height of 20.9 m. The maximum 100-year wave height is estimated to be 28.4 m (Fairfield, 2012).

The average sea surface water temperature in the Project area varies seasonally between approximately 4°C in winter to around 17°C in summer. Sea bottom temperatures vary between 5°C in winter to 12°C in summer (Fairfield, 2012).

4.1.2. Bathymetry and seabed conditions

Whilst a large number of environmental surveys have been undertaken within the Project area through the life of the Dunlin field and which is used below to describe the area (e.g. Gardline, 2009, 2011), there are a number of gaps with respect to coverage. To fill these gaps, Fairfield has commissioned additional survey work that is currently being processed and which will be available to inform the EIA in due course.

Seabed sediments across the Project area invariably consist of poorly sorted fine to medium muddy sands with varying admixtures of shell fragments and gravel. Occasional cobbles and boulders have also been observed. The seabed is generally flat with no seabed features such as pockmarks (or associated structures made by leaking gases), sandbanks, reefs, areas of hard ground nor notable topographic highs or lows observed. Debris and old seabed scars are evident around Dunlin Alpha.

Evidence of total hydrocarbon concentrations that are slightly raised relative to North Sea background levels have been recorded from the Project area. These are thought to have resulted from the history of concentrated oil and gas development in the region, coupled with deep water and fine muddy sediments that retain such historical discharges. There is evidence of drilling-related metals, most notably barium, in the sediments around Dunlin Alpha.

4.2. Biological environment

4.2.1. Benthos

The benthic fauna is relatively consistent across the Project area, as a result of the uniform sediment type and water depth. Infauna (animals in the seabed) of the Project area is characterised by polychaete worms and the small bivalve molluscs. Visible epifauna (animals on the seabed) recorded include hermit crabs, starfish, sea urchins, squat lobsters, Norway lobsters, cup corals and sponges. This benthic community composition is typical for the northern North Sea and is considered to be characteristic of those communities found in fine sediments in water depths greater than 100 m in the region.

4.2.2. Fish and shellfish

BEIS (formerly DECC, 2016a) report that species diversity within the fish community is not as great in the central and northern North Sea as in the southern North Sea. BEIS (DECC, 2016a) also reports that the fish community between 100 and 200 m (i.e. within the depth bounds of the Project area) is characterised by long rough dab *Hippoglossoides platessoides*, hagfish *Myxine glutinosa* and Norway pout *Trisopterus esmarkii*.

Fisheries sensitivity analysis (Coull *et al*., 1998, Ellis *et al.,* 2012) has been used to identify the spawning grounds (location where eggs are laid) and nursery grounds (location where juveniles are common) for commercially important fish species in the vicinity of the Project area (Table 4.1). The Project area is located within the potential spawning grounds of cod *Gadus morhua*, haddock *Melanogrammus aeglefinus*, Norway pout and saithe *Pollachius virens*. Potential nursery grounds that are coincident with the Project area include anglerfish *Lophius* spp., blue whiting *Micromesistius poutassou*, European hake *Merluccius merluccius*, haddock, herring *Clupea harengus*, ling *Molva molva*, mackerel *Scomber scombrus*, Norway pout, spurdog *Squalus acanthias* and whiting. Information on spawning and nursery seasonality for the different species is detailed in Table 4.1. It should be noted, however, that of these species, Aires *et al*. (2014) report that the probability of blue whiting, cod, European hake, haddock, herring, ling, mackerel, Norway pout, saithe, spurdog and whiting aggregations occurring in the Project area is low.

Table 4.1 Fish spawning and nursery timings in the Project area (Coull *et al.*, 1998, Ellis *et al.*, 2012)

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Anglerfish	N	N	N	N	N	N	N	N	N	N	N	N
Blue whiting	N	N	N	N	N	N	N	N	N	N	N	N
Cod	SN	SN	SN	SN	N	N	N	N	N	N	N	N
European Hake	N	N	N	N	N	N	N	N	N	N	N	N
Haddock	N	SN	SN	SN	SN	N	N	N	N	N	N	N
Herring	N	N	N	N	N	N	N	N	N	N	N	N
Ling	N	N	N	N	N	N	N	N	N	N	N	N
Mackerel	N	N	N	N	N	N	N	N	N	N	N	N
Norway pout	N	N	SN	SN	SN	N	N	N	N	N	N	N
Saithe	S	S	S	S								
Spurdog	N	N	N	N	N	N	N	N	N	N	N	N
Whiting	N	SN	SN	SN	SN	SN	N	N	N	N	N	N

Blank = No sensitivity	S = Peak spawning	S = Spawning	N = Nursery

4.2.3. Marine mammals

BEIS (DECC, 2016b) report that the northern North Sea has a moderate to high diversity and density of cetaceans. Harbour porpoise *Phocoena phocoena* and white-beaked dolphin *Lagenorhynchus albirostris* are considered the most frequently encountered species, occurring regularly throughout most of the year. Minke whale *Balaenoptera acutorostrata* are regularly recorded as a frequent seasonal visitor, whilst killer whales *Orcinus orca* are sighted with increasing frequency towards the deeper waters at the northern extent of the northern North Sea (DECC, 2016b). BEIS (DECC, 2016b) reports that Atlantic white-sided dolphin *Lagenorhynchus acutus*, Risso's dolphin *Grampus griseus* and long-finned pilot whale *Globicephala melas* are also occasional visitors. Occurrence of the most frequently recorded species is detailed in Table 4.2.

Both grey *Halichoerus grypus* and harbour *Phoca vitulina* seals are resident in UK waters and are widespread along the coastline of eastern Scotland. Both these seal species feed in inshore and offshore waters depending on the distribution of their prey, which changes both seasonally and yearly. Whilst both species tend to be concentrated close to shore, particularly during the pupping and moulting season, seal tracking studies indicate that the foraging movements of harbour seals are generally restricted to within a 40 – 50 km range of their haul-out sites (SCOS, 2014) whilst grey seal movements can involve longer trips of up to several hundred kilometres from one haul-out to another (SMRU, 2011). As the Project area is located approximately 196 km north east of Lerwick, these species may be encountered in the vicinity from time to time but are unlikely to use the area with any regularity or in great numbers. This is confirmed by the latest grey and harbour seal density maps published by the Sea Mammal Research Unit (SMRU), which reports the presence of grey and harbour seals in the offshore Project area of between zero and one individual per 25 km^2 (Jones *et al*., 2013).

Table 4.2 Occurrence of cetaceans in the vicinity of the Project area (Hammond *et al*., 2001, Reid *et al*., 2003)

Species	Description of occurrence
Harbour porpoise	Harbour porpoise are frequently found throughout the UK waters. They usually occur in groups of one to three individuals in shallow waters, although they have been sighted in larger groups and in deep water. It is not thought that the species migrate.
Killer whale	Widely distributed with sightings across the North Sea all year round; seen in both inshore waters (April to October) and the deeper continental shelf waters (November to March). May move inshore to target seals seasonally.
Minke whale	This species usually occurs in water depths of 200 m or less and occur throughout the northern and central North Sea. They are usually sighted in pairs or in solitude; however groups of up to 15 individuals can be sighted feeding. It appears that animals return to the same seasonal feeding grounds.
White-beaked dolphin	White-beaked dolphin are usually found in water depths of between 50 and 100 m in groups of around 10 individuals, although large groups of up to 500 animals have been seen. They are present in the UK waters throughout the year, however more sightings have been made between June and October.

4.2.4. Seabirds

The Project area is important for northern fulmar *Fulmarus glacialis*, gannet *Morus bassanus*, great black-backed gull *Larus marinus*, Atlantic puffin *Fratercula arctica*, black-legged kittiwake *Rissa tridactyla* and common guillemot *Uria aalge* for the majority of the year (e.g. Stone *et al.,* 1995, DECC, 2016c). Manx shearwaters *Puffinus puffinus* and European storm petrels *Hydrobates pelagicus* are present in the vicinity of the Project area between September and November. Great skua *Stercorarius skua***,** lesser black-backed gull *Larus fuscus*, herring gull *Larus argentatus*, glaucous gull *Larus hyperboreus* and little auk *Alle alle* are generally present in the region in low densities for the majority of the year. The arctic skua *Stercorarius parasiticus*, common gull *Larus canus*, Iceland gull *Larus glaucoides*, arctic tern *Sterna paradisaea* and razorbill *Alca torda* are present in low densities during varying months of the year

The seasonal vulnerability of seabirds to oil pollution in the immediate vicinity of the Project area has been derived from JNCC block specific data (Table 4.3). The months of March, July, October and November are those when seabird species at the Project area are most vulnerable to surface pollution, as shown in Table 4.3. Overall annual seabird vulnerability is low.

Table 4.3 Block specific seabird vulnerability to surface pollution in the Project area (JNCC, 1999)

Block	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
211/17	3	3	3	4	3	4	2	4	3	3	4	4	4
211/18	3	3	3	4	3	4	2	4	3	3	4	4	4
211/19	3	4	3	4	3	4	2	4	3	3	4	4	4
211/22	3	3	2	4	3	4	2	4	3	2	3	4	4
211/23	**3**	**3**	**2**	**4**	**3**	**4**	**2**	**4**	**3**	**2**	**2**	**4**	**4**
211/24	3	3	4	4	3	4	2	4	3	3	2	4	4
211/27	3	3	2	4	4	4	2	4	3	2	3	4	4
211/28	3	3	2	4	4	4	2	4	3	2	2	4	4
211/29	3	3	4	4	4	4	2	4	3	3	2	4	4

4 – Low	3 – Moderate	2 – High	1 – Very High

4.3. Conservation

There are no designated or proposed sites of conservation interest in the close vicinity of the Project (Figure 1.1). The closest designated site, the 'Pobie Bank Reef' Site of Community Interest lies 98 km to the south west, off the east coast of Shetland. The site has been designated for its stony and bedrock rocky reefs (JNCC, 2013).

The cold water coral, *Lophelia pertusa*, was observed on recent survey work (Fugro, 2016). *L. pertusa* is a reef building cold water coral that provides habitats for other epifaunal and fish species. Cold water reefs are an UK BAP habitat of principle importance, Annex I habitat and on the OSPAR List of Threatened and/or Declining Species and Habitats.

4.4. Socio-economic environment

4.4.1. Oil and gas

Other interests around the Project area include the Thistle platform located approximately 10 km north of Dunlin Alpha, the Causeway and Fionn fields at between 9 and 12 km to the west, Statfjord 15 km to the east, Murchison 16 km to the north east, Shell's Brent field 18 km to the south and Cormorant North 24 km to the west.

4.4.2. Commercial fisheries

The North Sea has important fishing grounds and is fished throughout by both UK and international fishing fleets, targeting both demersal, pelagic and shellfish fish stocks. The Project lies within International Council for the Exploration of the Sea (ICES) statistical rectangle 51F1. Table 4.4 lists the live weight and economic value of fish and shellfish landings into Scotland from 51F1 in 2012, 2013 and 2014 (Scottish Government, 2015). The demersal fisheries comprised over 79% of the value and 63% of the weight landed between 2012 and 2014 whilst pelagic fisheries contribute to 21% of the value and 37% of the weight landed, the majority of which was in 2014. The shellfish fishery contributed less than 1% of both value and weight landed in all years studied (Scottish Government, 2015). Table 4.5 presents fishing effort in ICES rectangle 51F1 between 2012 and 2014. Fishing effort was generally low throughout this period, but peaked between March and June during each year. Fishing data is 'disclosive' for much of the year, indicating that fewer than five fishing vessels utilise

the area per month. As outlined in Section 5.2, Fairfield has undertaken a fishing intensity study to better understand fishing in the Project area.

Table 4.4 Landings from ICES rectangle 51F1 in 2012, 2013 and 2014 (Scottish Government, 2015)

Species type	2012		2013		2014	
	Live-weight (tonnes)	Value (£)	Live-weight (tonnes)	Value (£)	Live-weight (tonnes)	Value (£)
Demersal	361	555,956	1,094	1,421,111	753	948,798
Pelagic	0	0	0	4	1,314	799,329
Shellfish	0	281	0	1,376	0	220
Total	**361**	**556,237**	**1,094**	**1,422,491**	**2,067**	**1,748,347**

Table 4.5 Number of days fished per month (all gears) in ICES rectangle 51F1 in 2012, 2013 and 2014 (Scottish Government, 2015)

Year	J	F	M	A	M	J	J	A	S	O	N	D	Total
2012	D	D	D	D	33	15	D	D	D	D	D	D	48
2013	D	D	18	32	32	66	17	D	D	D	D	D	165
2014	D	D	13	21	26	14	D	D	D	D	D	D	74

Note: Monthly fishing effort by UK vessels landing into Scotland: green = 0 – 100 days fished, yellow = 101 – 200, orange =201-300, red = ≥301. D = Disclosive[1], nd= no data.

4.4.3. Military activity

The Project area is not located within or near to any known military practice and exercise areas (DECC, 2016d) and the blocks of interest have no conditions attached with regard to special notifications to the Ministry of Defence (DECC, 2014).

4.4.4. Shipping activity

The North Sea contains some of the world's busiest shipping routes, with significant traffic generated by vessels trading between ports at either side of the North Sea and the Baltic. North Sea oil and gas fields also generate moderate vessel traffic in the form of support vessels (DECC, 2009).

An average of between 0.1 to 5 vessels per week pass the vicinity of the Project area with the majority of traffic consisting of small to medium sized cargo ships and tankers (MMO, 2014). Other vessels that pass within the vicinity of the Project area include dredging or underwater operation vessels and fishing vessels. BEIS (DECC, 2016d) report that shipping density in the Project area is low. Seismic surveys are also known to be occurring with reasonable frequency around the Project area.

[1] Rectangles in which less than five over 10 metre vessels undertook fishing activity are identified as a 'D'.

5. Understanding Potential Environmental Impact

5.1. Potential impacts

This section outlines the potential environmental and social impacts that may be associated with the decommissioning activities. During the EIA, the potential for their occurrence and associated level of significance will be assessed and possible mitigation measures identified. Potential impacts include:

- Seabed disturbance
  - There is potential for direct physical impact on the seabed and benthic habitats during the decommissioning activities, for example during any potential removal of the CGB structure. Disturbance to benthos and impacts on the water column may also result from the suspension of sediment during the removal of the CGB structure. Benthic spawning fish species could potentially be affected during operations if large areas of seabed are disturbed. Additionally, consideration of the potential disturbance to the existing drill cuttings pile will be key should the selected decommissioning options require removal or movement of the cuttings.
- Underwater noise
  - Underwater noise has the potential to be generated during decommissioning activities, from sources such as the cutting of the CGB structure, any potential requirement for use of explosives and from the use of vessels. The generation of this underwater noise could potentially result in injury or disturbance to marine mammals, seabirds and fish.
- Discharges to sea
  - Discharges to sea such as potential loss of oil from the drill cuttings pile to the water column resulting from any disturbance of the cuttings, marine growth cleaning, grey water and small amounts of hydraulic fluids all have the potential to impact the marine environment through pathways such as toxicity, bioaccumulation and organic enrichment. It will be important that the EIA quantifies these potential discharges and considers the impact on relevant receptors.
- Atmospheric emissions
  - Emissions to the atmosphere from the decommissioning activities will be associated primarily with power requirements and fossil fuel combustion by vessels. It will be important also that the EIA considers the energy requirement to recycle materials brought to shore and to replace any that are left offshore. Emissions include carbon dioxide (CO_2), NOx (generic term for NO nitric oxide and NO_2 nitrogen dioxide) and SOx (sulphur oxides). There is a potential for emissions released into the atmosphere to contribute to a variety of environmental impacts, including greenhouse gases concentrations, acidification (acid rain) and local air quality.
- Physical presence
  - The Project has the potential to result in interactions with other sea users and wildlife that utilise the Dunlin area and corridors to shore. Other users include fisheries, shipping, military, other oil, gas and energy infrastructure and, nearer to shore, leisure craft and ferries. Potential interactions such as short-term loss of access to sea area could result from increased vessel presence whilst long-term exclusion from areas of seabed could occur if any structures are decommissioned *in situ*.
  - The physical presence of vessels could also potentially affect wildlife through collision risk. Additionally, airborne noise and lights from vessels required during offshore activities have the potential to disturb seabirds of international and national interest, including migratory species that are within the Project area.

- Accidental events
    - Accidental events could include the release of hydrocarbons and chemicals and the dropping of objects during decommissioning activities. Such events could occur from activities such as a result of CGB cells and/or leg ruptures and vessel collisions. Accidental hydrocarbon and chemical releases have the potential to impact various receptors including marine flora and fauna, especially seabirds and fisheries. The potential for interactions and environmental impacts increases closer to shore, in part due to the numerous protected sites of the Shetland and Orkney coasts. The potential for releases to result in likely significant effects on protected areas, including both Special Protection Areas (SPAs, in the case of birds) and Special Areas of Conservation (SACs, in the case of species other than birds and of habitats) will require consideration in the forthcoming EIA, as will the potential for causing a significant risk to the conservation objectives of other marine protected areas such as Nature Conservation Marine Protected Areas (NCMPAs).
- Waste generation
    - Solid waste will be generated during decommissioning. Waste will be managed in line with regulatory requirements and sent to appropriate licensed onshore segregation and disposal facilities. Fairfield waste management philosophy incorporates the requirement that waste should be prevented or reduced as far as possible, but where it cannot be prevented, it should be reused and recycled to the extent practicable. However, it is anticipated that some waste generated may need to be sent to landfill.
- Cumulative and transboundary impacts
    - The potential for the Project to act cumulatively or in combination with other offshore or nearshore projects will require consideration in the EIA. Examples of potential cumulative impact include disturbance to habitats and species in multiple locations from different Projects (decommissioning or otherwise) which could significantly affect the habitat or species as a whole, and disturbance to wildlife through underwater noise from multiple locations excluding animals from a significant proportion of their foraging range.

5.2. Supporting Studies

In order to better understand the potential for the impacts described above to occur and to assist in definition of significance, Fairfield has identified a series of key studies/reports that will be initiated:

- Survey work
    - An environmental baseline survey and habitat assessment for the Project area, and a subsea Remotely Operated Vehicle (ROV) survey campaign covering the CGB structure has been undertaken and will inform the EIA.
- CGB cell contents data assessment
    - Assessment of data on the contents of the cells in the CGB and high-level modelling of a potential release of such contents.
- Drill cuttings fate modelling
    - It is assumed that between 1978 and 2000, oil-based muds were used and oil-contaminated discharges took place in line with normal, permitted operations at the time, and the cuttings pile that is in place is consequently oil-contaminated. The use of modelling to further understand the implications of interaction with the drill cuttings (e.g. if they are moved or disturbed, is there likely to be a significant impact on benthos or the water column?) will be considered.
- Commercial fisheries study (complete)
    - The aim of the assessment was to gain an up-to-date understanding of current and future fishing activity in the Project area and undertake a high-level assessment of potential socio-

economic impacts to the fishing industry of decommissioning activities. Publicly available fishing data including fishing effort, landings value and vessel monitoring system (VMS) data were used to inform the assessment. Additionally, an engagement exercise has been performed by SFF Services Limited involving spending approximately three days interviewing and collecting data from vessel owners from the relevant ports likely to be fishing within the Project area.

- Underwater noise modelling
    - Underwater noise modelling will be undertaken to estimate underwater noise levels, impact zones for injury and disturbance to marine mammals (including European Protected Species) and potential mitigation strategies (as appropriate). Noise impacts on fish and seabirds will not be covered in this detailed assessment but will be considered as part of the wider EIA.
- Energy and emissions inventory
    - In order to provide an indication of the energy and emissions produced during the proposed decommissioning activities, the methodology detailed in The Institute of Petroleum (IP, 2000) guidelines for the calculations of estimates of energy use and gaseous emissions in the decommissioning of offshore structures methodology will be followed to make predictions of the potential energy use and consequent gaseous emissions.
- Waste management strategy
    - A waste management strategy has been developed to account for the generation and treatment of waste. This will include consideration of the presence of hazardous and radioactive wastes.

As part of the ongoing EIA process, further studies may be identified and completed to ensure a fully informed EIA process is carried out.

6. Responses and enquiries

With regards to the above, do you consider the list of potential impacts appropriate? Are there any specific additional data sources that should be considered? Fairfield would welcome any comment or feedback on the proposed approach to the EIA.

To respond to this scoping document, request a meeting to discuss the decommissioning activities or to make further enquiry, please contact Fairfield at:

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8. Acronyms and glossary

% – Percent.

£ – Pound Sterling.

°C – degrees Celsius

As Low As Reasonably Practicable (ALARP) – The principal that residual risk shall be as low as reasonably practicable, by which risk is reduced to the point at which the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained.

Attic oil – The CGB cells were previously used to separate hydrocarbons from water. Attic oil is the oil from the separation activities that has floated to the top of cell.

BAP – Biodiversity Action Plan

BEIS – Department of Business, Energy and Industrial Strategy (replacement of DECC, see below).

Benthos – The living community of the bottom of the sea.

CO_2 – Carbon dioxide.

Comparative Assessment (CA) – This framework allows for consideration of issues of technical feasibility, safety, environment, society and cost in a balanced and transparent manner to identify a preferred option for decommissioning of a particular structure.

Competent Authority – Organisation that has the legally delegated or invested authority, capacity, or power to perform a designated function

Concrete Gravity Base (CGB) – The concrete structure on the seabed on which the concrete legs of the Dunlin platform sit. The platform and topsides sit on top of those legs.

DECC – Department of Energy and Climate Change (*note, now BEIS, see above, DECC applicable to references only*.

Derogation case – With regards to OSPAR Decision 98/3 which prohibits leaving offshore installations wholly or partly in place, it is recognised that there may be difficulty in removing the bases of large steel jackets weighing more than 10,000 tonnes and in removing concrete installations and, as a result, there is a facility for derogation from the main rule for such installations by which such installations may be left in place.

Environmental impact assessment (EIA) – A process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

Epifauna – Benthic organisms that inhabit the surface of the seabed.

European Protected Species – Animals (and plants) that are listed in Annexes II and IV of the European Commission Habitats Directive and which are consequently afforded additional protection in the UK.

ICES – International Council for the Exploration of the Sea.

Infauna – Benthic organisms living within the seabed.

JNCC – Joint Nature Conservation Committee.

km – Kilometre.

km^2 – Square kilometre.

m – Metre.

m^2 – Square metre.

m^3 – Cubic metre.

ms^{-1} – Metre per second.

N – Nursery.

NOx – Generic term for nitric oxide and nitrogen dioxide.

OGUK – Oil and Gas United Kingdom.

PMF – Priority Marine Feature.

ROV – Remotely Operated Vehicle.

S – Spawning.

SFF – Scottish Fishermen's Federation.

SFF Services Limited – Commercial arm of Scottish Fishermen's Federation.

SMRU – Sea Mammal Research Unit.

SOx – Sulphur oxides.

Tie-back – A well or field with minimal subsea structures that passes hydrocarbons onto another field where the produced hydrocarbons are then processed.

Topsides – The upper structure of an oil and gas installation, above the sea level, on which all equipment and accommodation is installed.

UKCS – United Kingdom Continental Shelf.

VMS – Vessel Monitoring System.