2018

OSPAR Public Statement 2017

PERENCO

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Abbreviations

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CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CHARM	Chemical Hazard and Risk Management
CO_2	Carbon dioxide
EEMS	Environmental and Emissions Monitoring System
ETS	Emissions Trading Scheme
HQ	Hazard Quotient
MEG	Mono Ethylene Glycol
MW(th)	Megawatt Thermal
NOx	Nitrogen Oxides
NUI	Normally Unattended Installation
OCNS	Offshore Chemical Notification Scheme
OPPC	Oil Pollution Prevention and Control
OPRED	The Offshore Petroleum Regulator for Decommissioning & Environment
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PEC:NEC	Predicted Effect Concentration against No Effect Concentration
PLONOR	Pose Little Or No Risk
PUK	Perenco UK Limited
QSSHE	Quality, Safety, Security, Health and Environment
SEMS	Safety and Environmental Management System
SNS	Southern North Sea
SO_2	Sulphur Dioxide
UKCS	UK Continental Shelf

Executive Summary

This statement has been prepared to fulfil the Offshore Petroleum Regulator for Decommissioning & Environment (OPRED) requirement under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) Recommendation 2003/5 to produce an annual public environmental statement.

The statement is an open and transparent representation of our environmental performances across our offshore assets for the 2017 calendar year. It provides performance information and describes the extent at which we are meeting our environmental targets as well as setting out future objectives.

The offshore data reported within this statement relates to seven manned installations, 36 normally unattended installations (NUIs) and seven subsea installations producing gas and liquids that are tied back through pipelines to the onshore gas terminals at Dimlington and Bacton.

Environmental Performance

The total carbon dioxide emissions resulting from offshore combustion equalled 246,833 tonnes during 2017. In addition, a total of 1,524 tonnes of hydrocarbon gases were emitted into the atmosphere from our southern North Sea assets.

During 2017, ten of our assets discharged, after treatment, oil in produced water to sea. The monthly flow-weighted average concentration of oil in produced water for the majority of our Southern North Sea assets was below the consented limit (30 mg/l). However, this limit was exceeded at three of our assets (Hyde, Inde AC and Ravenspurn North Johnston tie back).

The majority (91 percent) of chemicals used during production operations were rated as 'Pose Little Or No Risk' (PLONOR). Only four chemicals identified as candidates for substitution were used in production operations, with a total use of 11,821 kg and discharge of 10,921 kg. In addition, chemicals were also used during well intervention operations at Guinevere and Tyne during 2017. The majority of the chemicals used and discharged during non-production operations were PLONOR.

The total waste generated from offshore production operations equalled 1,176 tonnes during 2017. Approximately 98 percent was recycled or otherwise managed, rather than being consigned to landfill. In addition, a total of 6,247 tonnes of waste was generated from other operations during 2017, with approximately 57 percent recycled or otherwise managed, rather than consigned to landfill.

There were 26 hydrocarbon and chemical spills to the marine environment during 2017, of which 27 percent (7 spills) were spilt chemicals.

1 Introduction

The OPRED requires all operators of offshore installations to produce a Public Statement to report their environmental performance under the OSPAR Recommendation 2003/5 to Promote the Use and Implementation of Environmental Management Systems by the Offshore Industry. These statements must be prepared on an annual basis (covering offshore installation activities carried out during the previous calendar year), made available to the public and copied to OPRED by 1st June of each year.

This report outlines Perenco UK Limited (referred to hereafter as 'PUK') environmental performance for its UK Continental Shelf (UKCS) operations during 2017. The report consists of the following:

- **Section 2:** describes PUK's activities in the UKCS during 2017;
- **Section 3:** provides a summary of PUK's ISO 14001-certified Safety and Environmental Management System (SEMS) that provides the framework for the control of the environmental impacts from production activities and lists the environmental objectives and targets set by PUK in 2017 and their current status;
- **Section 4:** summarises PUK's performance during 2017 in relation to the Environmental Policy, objectives and targets, and relevant legislative requirements; and
- **Section 5**: sets new environmental objectives and targets for 2018.

2 2017 UKCS Operations

2.1 Production Assets

PUK has been an operator in the Southern North Sea since September 2003. Offshore, PUK is responsible for six installations that are classified as "manned" (Indefatigable 23A & 23C, Leman 27A, Cleeton, Ravenspurn North CPP, West Sole Alpha), 41 NUIs and 16 subsea installations producing gas and liquids that are tied-back through pipelines to the onshore gas terminals Dimlington, Theddlethorpe and Bacton.

Table 2.1 lists PUK's southern North Sea installations and Figure 2.1 shows their locations. All PUK-operated assets were producing during 2017, with the exception of Arthur, Bessemer, Bure O, Bure West, Davy North, Durango, Gawain, M1, Thames, Tyne, Welland, Wollaston, Yare 'C', Kilmar and Garrow.

Figure 2.1: PUK's Southern North Sea Installations

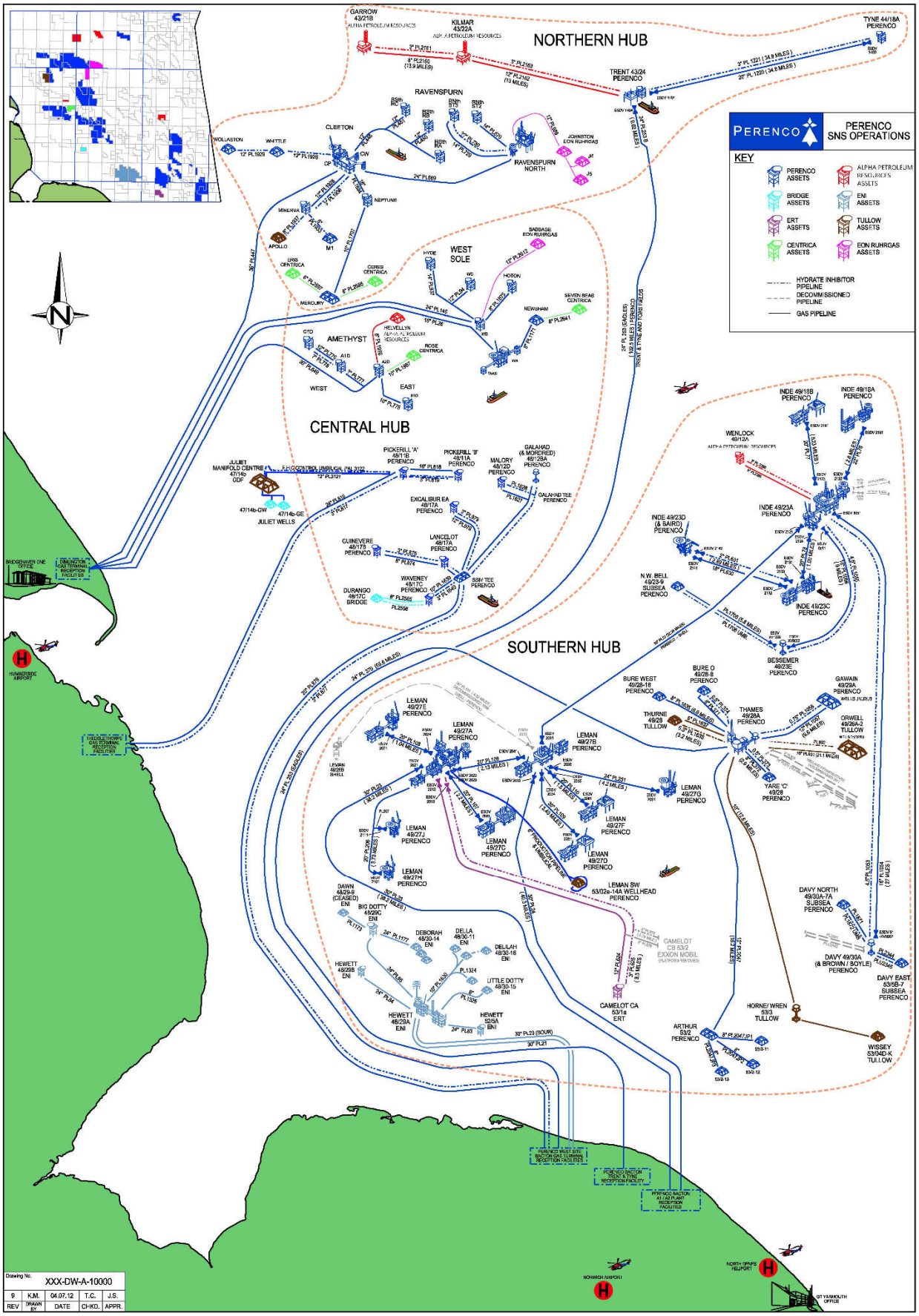


Table 2.1: PUK's Southern North Sea Installations

Installation	UKCS Block	Type	Status in 2017
Amethyst A1D	47/14	NUI	Produced
Amethyst A2D	47/14	NUI	Produced
Amethyst B1D	47/15	NUI	Produced
Amethyst C1D	47/14	NUI	Produced
Arthur	53/2	Subsea	No production *
Bessemer	49/23	NUI	No production
Bure O	49/28	Subsea	No production *
Bure West	49/28	Subsea	No production *
Cleeton	42/29	Manned	Produced
Davy	49/30	NUI	Produced
Davy East	53/5	Subsea	Produced
Davy North	49/30	Subsea	No production
Durango	48/21	Subsea	No production
Excalibur	48/17	NUI	Produced
Galahad	48/12	NUI	Produced
Gawain	49/29	Subsea	No production *
Guinevere	48/17	NUI	Produced
Hoton	48/07	NUI	Produced
Hyde	48/06	NUI	Produced
Indefatigable 18A	49/18	NUI	Produced
Indefatigable 18B	49/18	NUI	Produced
Indefatigable 23A	49/23	Manned	Produced
Indefatigable 23C	49/23	Manned	Produced
Indefatigable 23D	49/23	NUI	Produced
Lancelot	48/17	NUI	Produced
Leman 27A	49/27	Manned	Produced
Leman 27B	49/27	NUI	Produced
Leman 27C	49/27	NUI	Produced
Leman 27D	49/27	NUI	Produced
Leman 27E	49/27	NUI	Produced
Leman 27F	49/27	NUI	Produced
Leman 27G	49/27	NUI	Produced

Installation	UKCS Block	Type	Status in 2017
Leman 27H	49/27	NUI	Produced
Leman 27J	49/27	NUI	Produced
Leman South	53/02	Subsea	Produced
M1	47/04	Subsea	No production
Malory	48/12	NUI	Produced
Mercury	47/09	Subsea	Produced
Minerva	47/03	NUI	Produced
N.W. Bell	49/23	Subsea	Produced
Neptune	47/04	NUI	Produced
Newsham	48/07	Subsea	Produced
Pickerill A	48/11	NUI	Produced
Pickerill B	48/11	NUI	Produced
Ravenspurn North CPP	43/26	Manned	Produced
Ravenspurn North ST2	43/26	NUI	Produced
Ravenspurn North ST3	42/30	NUI	Produced
Ravenspurn South A	42/30	NUI	Produced
Ravenspurn South B	42/30	NUI	Produced
Ravenspurn South C	42/30	NUI	Produced
Trent	43/24	NUI	Produced
Tyne	44/18	NUI	No Production*
Waveney	48/17	NUI	Produced
Wenlock	49/12	NUI	Produced
West Sole Alpha	48/06	Manned	Produced
West Sole Bravo	48/06	NUI	Produced
West Sole Charlie	48/06	NUI	Produced
Whittle	42/28	Subsea	Produced
Wollaston	42/28	Subsea	No production
Yare 'C'	49/28	Subsea	No production *
Kilmar	43/22	NUI	No production
Garrow	43/21	NUI	No production

***Undergoing decommissioning.**

2.2 Other Offshore Operations

In addition to production operations, PUK undertook the following offshore projects in the Southern North Sea during 2017:

- **Tyne Decommissioning**: Severing of production tubing using explosives in each of the 4 wells in (44/18a-T1z, 44/18a-T2, 44/18a-T3a and 44/18a-T4a) (November 2017)

- **Guinevere Decommissioning:** Deployment of the Seafox 1 (jack-up barge) to plug and abandon Guinevere wells (September-December 2017).

- **Ravenspurn ST3 Well Intervention:** Deployment of the Seafox 2 (Jack-up barge) to conduct eight well bore sand clean outs on the Ravenspurn North ST3 NUI (15th January 2017 – 29th March 2017):

- **Ravenspurn ST2 Drilling Campaign:** Deployment of drilling rig (Rowan Gorilla VII) to drill (43/26a-E12) at the Ravenspurn North ST2 Platform (15th November 2016 – 31st December 2017).

- **Inde Gas Compression Rationalisation Project (IGCR):** Bypassing of high pressure compression so all gas flows through low pressure compression (2015 – October 2017).

This OSPAR Public Statement only includes data reported via the online Environmental and Emissions Monitoring System (EEMS) during 2017.

3 PUK Safety and Environmental Management System

PUK operate under a SEMS, certified to ISO 14001. The PUK SNS SEMS provides a uniform approach to every element of operations across SNS assets. With regards to health, safety, security and environmental management the purpose of the SEMS is to ensure that, as far as reasonably practicable, all of the installation's activities are undertaken in accordance with PUK commitment to its QSSHE Policies and compliance with all relevant statutory provisions applicable to offshore operations within SNS.

SEMS includes PUK, SNS and site specific processes and procedures through which the local business is delivered. The SEMS framework comprises 15 key components which together provide a roadmap to safe, environmentally responsible and reliable operations.

Each of the 15 Perenco standards sets out high level targets which shall be complied with, a set of actions to be implemented, along with supporting information to provide guidance on implementation.

SEMS is accessible through the PUK intranet and is a web based application which provides a single point of access to all SEMS information including business processes, procedures and information portals. Refer to Figure 3.1 below.

Figure 3.1: PUK's SEMS

It is these business processes, procedures and information that describes in more detail how PUK achieves conformance with the Perenco Standards.

3.1 The Environmental Policy

PUK's Environmental Policy is presented in Figure 3.2 below. It informs the definition of our significant environmental impacts that are the focus of our environmental management activities.

Figure 3.2: PUK's Environmental Policy

Perenco UK Environmental Policy

Perenco's Environmental Goals are no damage to the environment and to minimise our emissions. Maintaining an efficient and effective environmental management system that meets the requirements of ISO14001 will assist to deliver our environmental goals and assess and mitigate the environmental risks of our operations.

Perenco UK is committed to integrating environmental management into its oil and gas exploration, production and processing operations and managing, with due diligence, its footprint on marine and coastal environments and on local communities.

We recognise that our activities have impacts on the environment. Perenco UK Senior Management are committed to ensure that protection of the environment is firmly embedded in the Company's culture and will endeavour to influence suppliers and contractors in a similar strategic manner.

Our offshore and onshore activities have been reviewed for significance of their environmental impacts. In order to minimise these impacts, concerning our activities, we shall:

- Comply with all applicable environmental legislation and other requirements.
- Ensure that all employees and contractors are competent to carry out tasks in an environmentally responsible manner and ensure that a continuous professional development strategy remains core to our business goals.
- Maintain the integrity of our facilities to prevent accidental discharges of pollution substances.
- Adopt best practice and economically viable technologies to minimise our impacts and improve our energy efficiency.
- Set annual performance targets with support plans.
- Perform regular audits of all our activities, using the results to drive environmental improvements.
- Maintain emergency response plans and undertake regular emergency drills and exercises to test our capability to respond quickly and effectively to any environmental incidents.
- Report and investigate all incidents, taking appropriate measures to prevent their occurrence.
- Maintain and enhance the ecological environment through management and monitoring.

We are committed to continual improvement of our environmental management system to enhance our environmental performance. This Policy will be communicated to all employees, contractors and suppliers and will be made available to all interested parties.

Endorsed by:

Date: October 2016

PUK-SMS-COM-019

3.2 Progress against 2017 Environmental Objectives and Targets

PUK's significant routine environmental aspects and associated objectives and targets for their offshore operations during 2017 are presented in Table 3.1, along with their current status.

Table 3.1: Environmental Objectives and Targets for 2017

Aspect	Objective	Performance/Status
Emissions of Carbon Dioxide (CO2)	Retain CO2 emissions within allocations set for permitted installations	The process is ongoing
Emissions of Hydrocarbon (HC) Gases	Identify opportunities for the reduction in HC venting	The process is ongoing
Emissions of Other Combustion Products	Monitor and where reasonably practicable reduce oxides of nitrogen (NOx) emissions from relevant combustion equipment	The process is ongoing
Discharge of Oil in Produced Water	Ensure the monthly average concentration of oil discharged in produced water does not exceed the platform allowance	Partially achieved – achieved on seven of the ten permitted installations
Discharge of Production Chemicals	Reduce the use and/or discharge of production chemicals that carry substitution warnings	Not achieved – Chemicals carrying substitution warnings were used and discharged during operations in 2017
Hydrocarbon and Chemical Spills to Sea	<10 reportable spills (N.B. Any spill to sea, irrespective of size, is reported to the regulator, BEIS)	Not achieved – a total of 26 reportable spill events

4 Environmental Performance Summary

PUK monitor and report on atmospheric emissions, the discharge of oil in produced water, the use and discharge of chemicals, the disposal of waste and hydrocarbon and chemicals spill incidents. This section presents the information that was reported via the online Environmental and Emissions Monitoring System (EEMS) for operations during 2017.

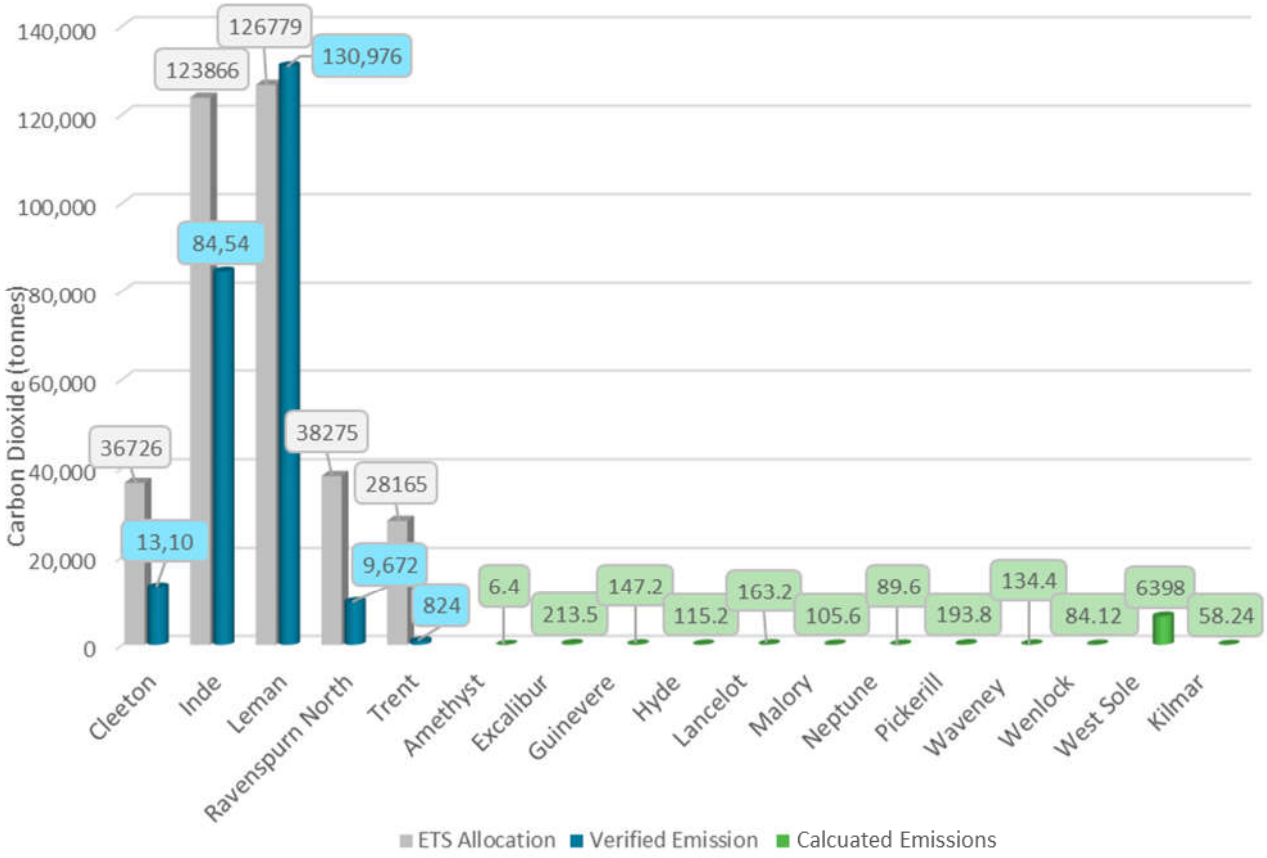
4.1 Atmospheric Emissions

4.1.1 Production Operations

Carbon dioxide (CO_2) emissions from five of our manned offshore installations are subject to control under the Greenhouse Gases Emissions Trading Scheme (ETS) Regulations 2012 (as amended). The assets that have an allocation for CO_2 emissions include Cleeton, Indefatigable, Leman, Ravenspurn North and Trent and we seek to ensure that our emissions are within the allocated limits.

Figure 4.1 shows PUK's verified and calculated CO_2 emissions from fuel combustion associated with production operations for 2017, together with the corresponding EU ETS allowance (where relevant).

Figure 4.1: Carbon Dioxide Emissions from Fuel Combustion Associated with Production Operations



During 2017 a total of 246,833 tonnes of CO_2 were emitted to the atmosphere from all of our Southern North Sea assets. One of our offshore installations, which is subject to control under the Greenhouse Gases ETS, (Leman) had emissions of CO_2 greater than the allocated EU ETS allowance). The Leman CO_2 emissions were narrowly (3.31 percent) over the EU ETS allocation.

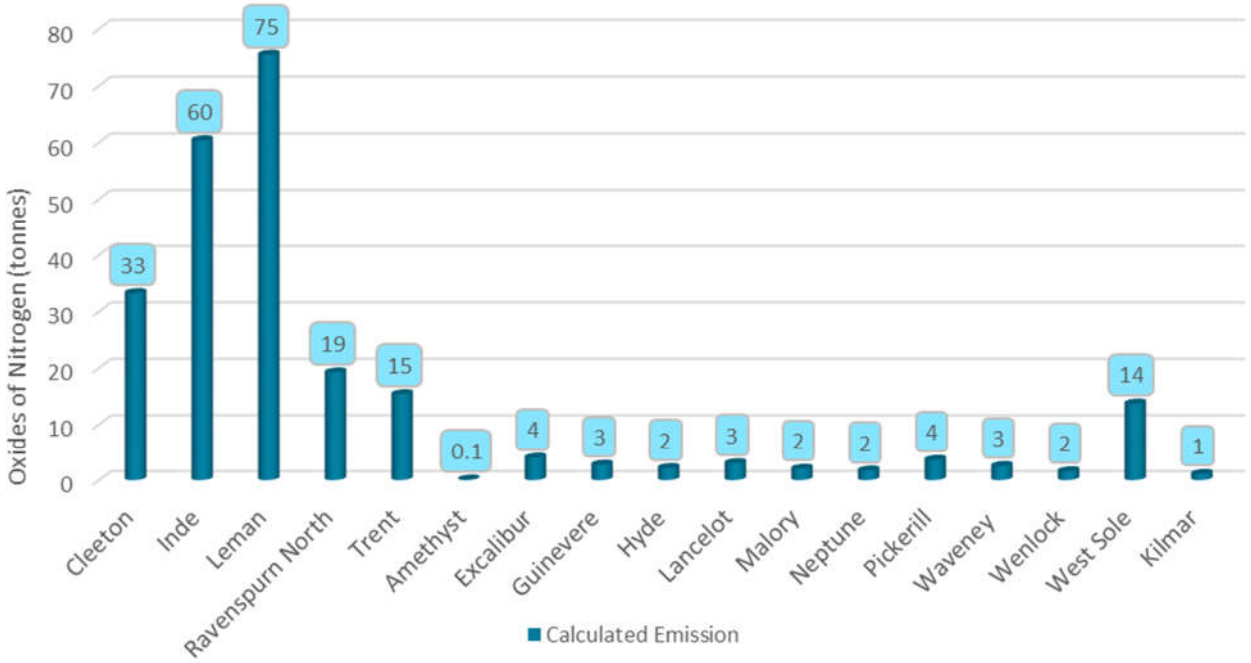
The environmental impacts of concern attributable to combustion processes also include the emissions to atmosphere of Nitrogen Oxides (NOx). These have the potential to cause health impacts, and also contribute to acid rain. Offshore receptors are broadly insensitive to the amounts of NOx that are emitted from the combustion of gas. The Southern North Sea assets; Cleeton, Indefatigable, Leman, Ravenspurn

North and Trent have an installed capacity exceeding 50 MW (th) and are subject to regulatory controls under the Offshore Combustion Installations (Pollution Prevention and Control) Regulations 2013.

During 2017 the NO_x emissions from these five installations was 202 tonnes, which is approximately 0.4 % of the total NO_x released from the offshore Oil & Gas industry during 2017. The small proportion of total loading from the offshore oil and gas industry means that the environmental effects of the NO_x emissions from PUK's Southern North Sea assets are minimal and the cost of retrofitting NO_x emission combustion equipment is prohibitive in the circumstances of declining oil fields and ageing assets.

Figure 4.2 presents the calculated NO_x emissions from fuel combustion associated with production operations during 2017.

Figure 4.2: Nitrogen Oxide Emissions from Fuel Combustion Associated with Production Operations

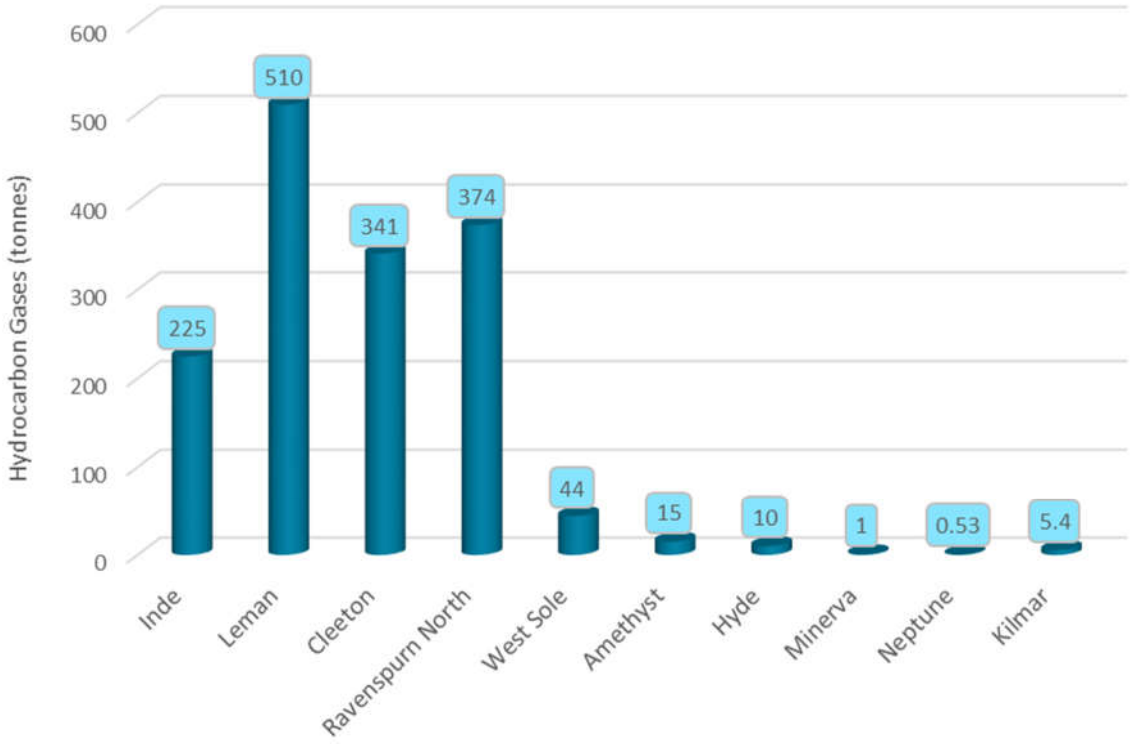


4.1.2 Emissions of Hydrocarbon Gases

The venting of hydrocarbon gases is subject to regulatory control as part of our production licences and Vent Consents issued under the Energy Act of 1976.

The loss of gas to the atmosphere results from both routine and upset conditions. PUK monitors and report the amount released and this is summarised in Figure 4.3.

Figure 4.3: Hydrocarbon Gas Emissions Associated with Production Operations



During 2017 a total of 1,524 tonnes of hydrocarbon gases were emitted into the atmosphere from our Southern North Sea assets. PUK will continue to investigate potential opportunities to reduce CO_2 and other gaseous emissions from all of our installations.

4.1.3 Other Operations

There were no atmospheric emissions reported via EEMS for the offshore projects undertaken in 2017, as listed in Section 2.2.

4.2 Discharge of Oil Regulated under OPPC Regulations

The discharge of oil is subject to control under the Oil Pollution Prevention and Control (OPPC) Regulations 2005 (as amended).

4.2.1 Production Operations

After treatment, oil in produced water was discharged from 10 of our operated assets in the southern North Sea. The volume of produced water discharged from each asset during 2017 is presented in Figure 4.4 and the monthly flow-weighted average concentration of oil in produced water for each asset, along with the consented limit, are presented in Figure 4.5. Please note, there are produced water re-injection systems at Cleeton, Leman and Amethyst.

Figure 4.4: Discharged Produced Water

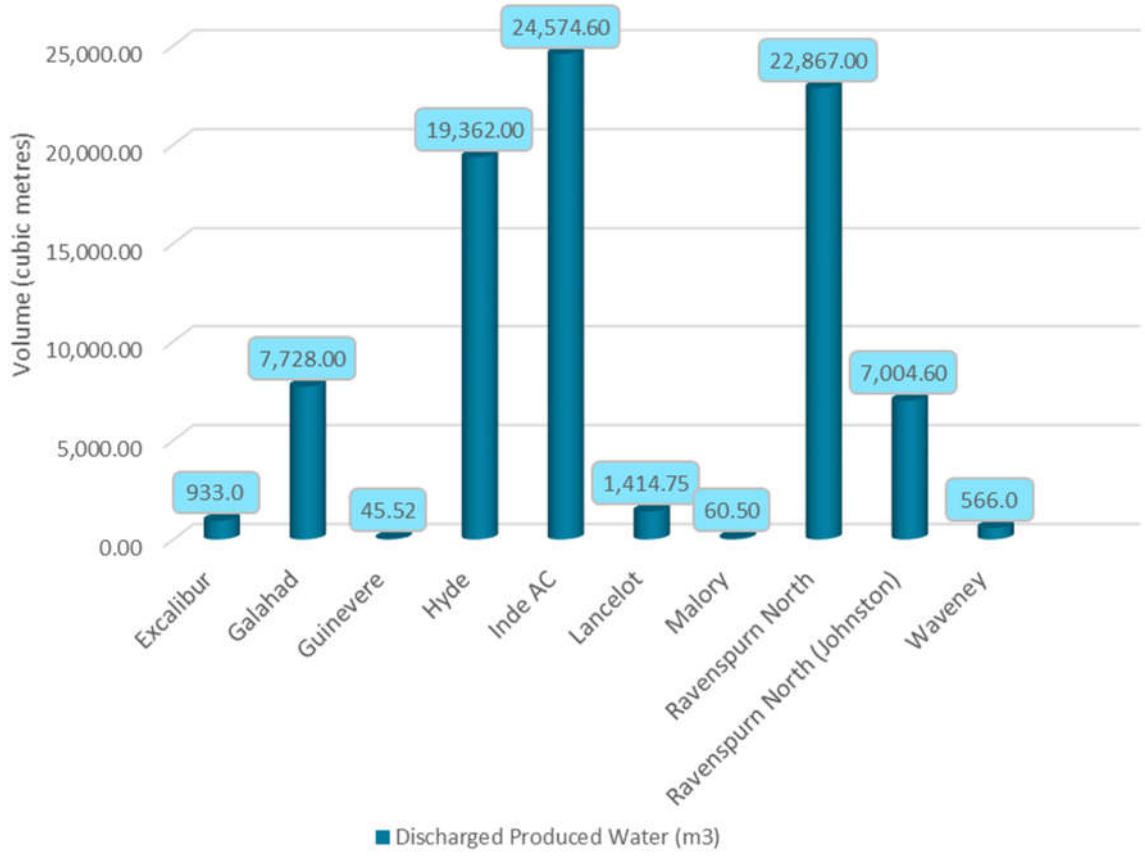
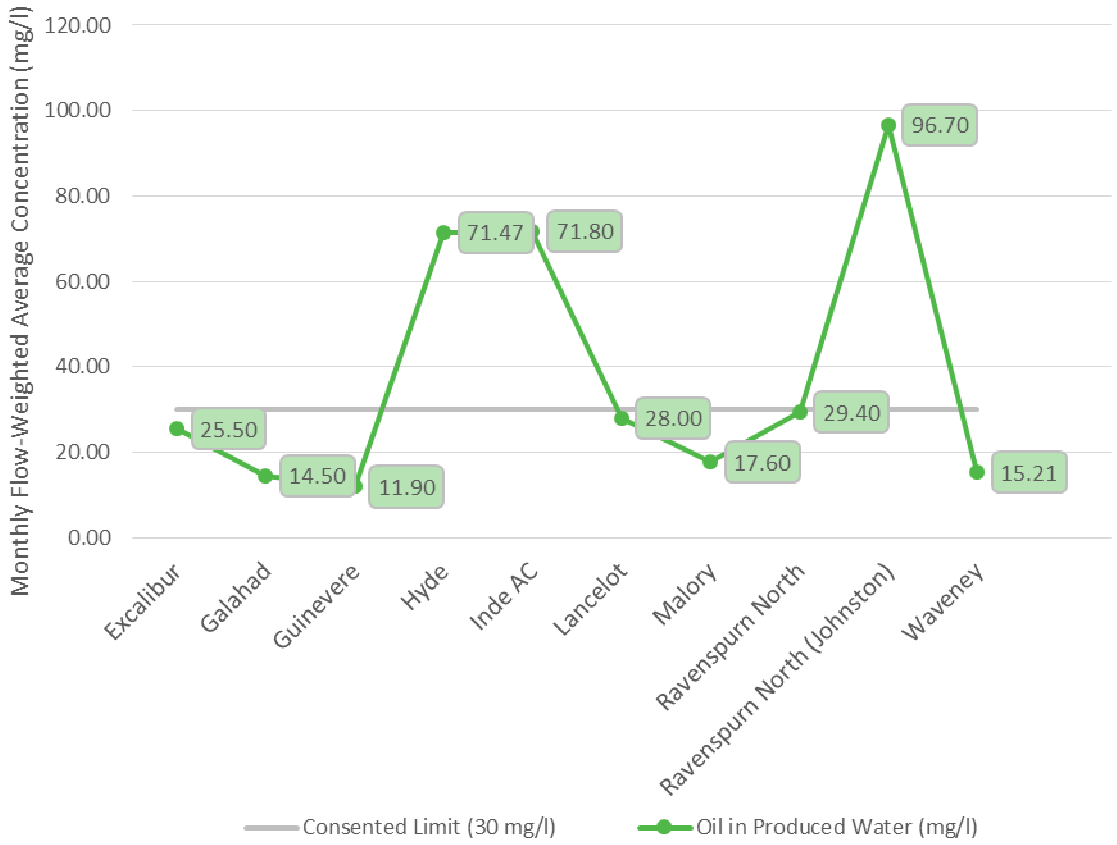


Figure 4.5: Monthly Flow-Weighted Average Concentration of oil in Produced Water



During 2017, the monthly flow-weighted average concentration of oil in produced water for the majority of our Southern North Sea assets was below the consented limit (30 mg/l). However, this limit was exceeded at three of our assets (Hyde, Inde AC and Ravenspurn North (Johnston tie back)). The reason for this exceedance is provided below.

Hyde

Hyde exceeded due to contaminated sample, a subsequent sample was well within limits.

Inde AC

The Inde Platform had a non-compliance for exceeding the permitted limit (30 mg/l) of oil in water concentration between February and May 2017. This was due to the water handling instrumentation causing a spill over of condensate into the produced water treatment system and therefore reducing the effectiveness of the oil removal. During this time, water handling was shut in to minimise overboard discharge.

Ravenspurn North (Johnson)

The Ravenspurn North Johnson Tie-In had a non-compliance for exceeding the permitted limit (30 mg/l) of oil in water concentration. The Johnston coalescer is oversized for the amount of water and therefore does not operate effectively. The remedial works carried out on Johnston well J6 by Premier Oil to ensure well flow creates a large amount of produced water. Insufficient separation causes an emulsion to be formed within the produced water, resulting in high readings. Occasional excursions of this produced water occurs when the well is brought online after resting and a slug of liquid is received. When possible the produced water from Johnston is processed through the Ravenspurn North system, however both Ravenspurn North

and Johnson have historically discharged produced water which was a far higher level than the 30 mg/l limit set in the permits.

In order to improve performance, modifications to the produced water process were commissioned mid-January 2018, after delays caused by the supply of incorrect parts. The new oily water treatment package consists of a bespoke filtration system with coalescer as a further means of removing hydrocarbons.

In addition to oil in produced water, oil on sand / scale was also discharged from the Ravenspurn North installation during 2017, as presented in Table 4.1. Although higher than in 2015 and 2016, this is still within the permitted amount.

Table 4.1: Discharge of Oil from Sand and Scale

Operation	Quantity of Sand/Scale Discharged (tonnes)	Quantity of Oil on Sand / Scale Discharged (tonnes)	Average Concentration (mg / kg)
Schedule 6a Online Sand / Scale at the Ravenspurn North Platform	4.075	0.006	1472.39

4.2.2 Other Operations

None of the offshore projects undertaken in 2017, as listed in Section 2.2, resulted in the discharge of oil regulated under the OPPC Regulations.

4.3 Discharge of Chemicals

The use and discharge of chemicals is subject to control under the Offshore Chemicals Regulations 2002 (as amended). This requires regulatory approval following an assessment of the predicted environmental impacts of any proposed discharges. In addition, only chemicals that have been registered by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) may be used.

All chemical products used offshore undergo a hazard assessment, using the Chemical Hazard and Risk Management (CHARM) model, to calculate the ratio of Predicted Effect Concentration against No Effect Concentration (PEC:NEC). This is expressed as a Hazard Quotient (HQ), which is converted to a colour banding (Purple, Orange, Blue, White, Silver and Gold, in order of environmental hazard level (highest to lowest)) and used to rank the product.

Products that are not subject to CHARM modelling (i.e. inorganic substances, hydraulic fluids or chemicals used only in pipelines) are assigned an Offshore Chemical Notification Scheme (OCNS) grouping, A - E. Group A includes products considered to have the greatest potential environmental hazard and Group E the least.

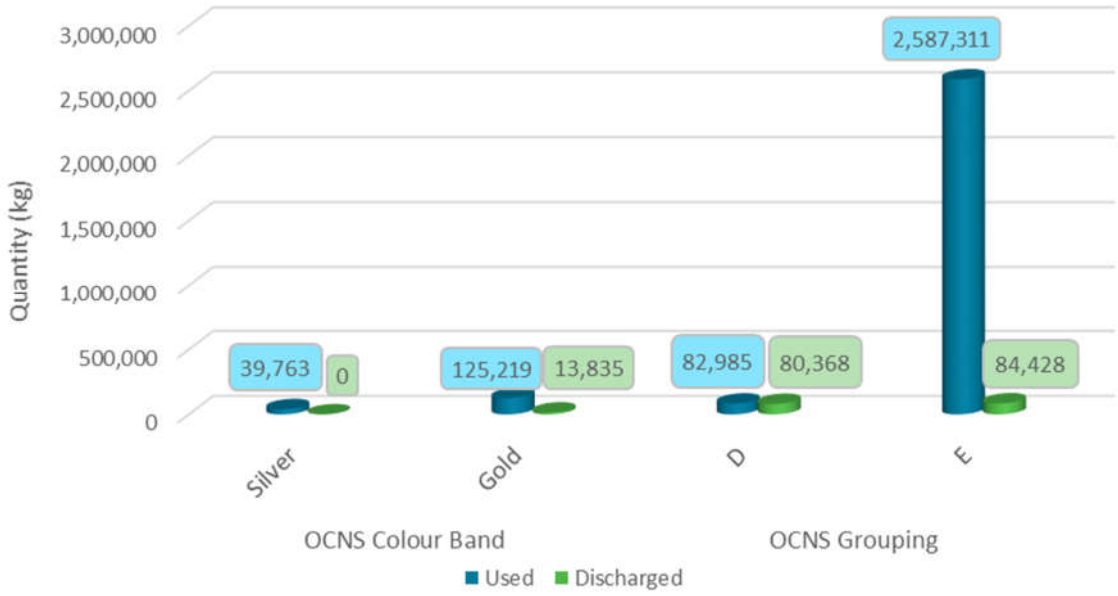
In addition to the OCNS colour bands and groupings, OSPAR identified chemicals considered to Pose Little Or No Risk to the environment as 'PLONOR' and those considered harmful to the environment as 'candidates for substitution'. We actively seek to select chemicals without a substitution warning, however there are instances where a lack of a suitable alternative is not suitable for technical or safety reasons. This may require the use of chemicals with substitution warnings.

4.3.1 Production Operations

Gas production required only a limited range of production chemicals, mainly for the purposes of hydrate inhibition, corrosion control and separation of liquid hydrocarbons. The use of production chemicals is permitted at the Amethyst, Cleeton, Hyde, Kilmar, Inde, Leman, Lancelot, Pickerill, Ravenspurn North, Trent, Tyne, Wenlock, West Sole installations. The Tyne and Guinevere platforms are undergoing decommissioning but still require chemical allowances for utility chemicals.

Figure 4.6 presents a breakdown of the total chemicals used and discharged for all of our production operations in the southern North Sea by OCNS colour band / grouping.

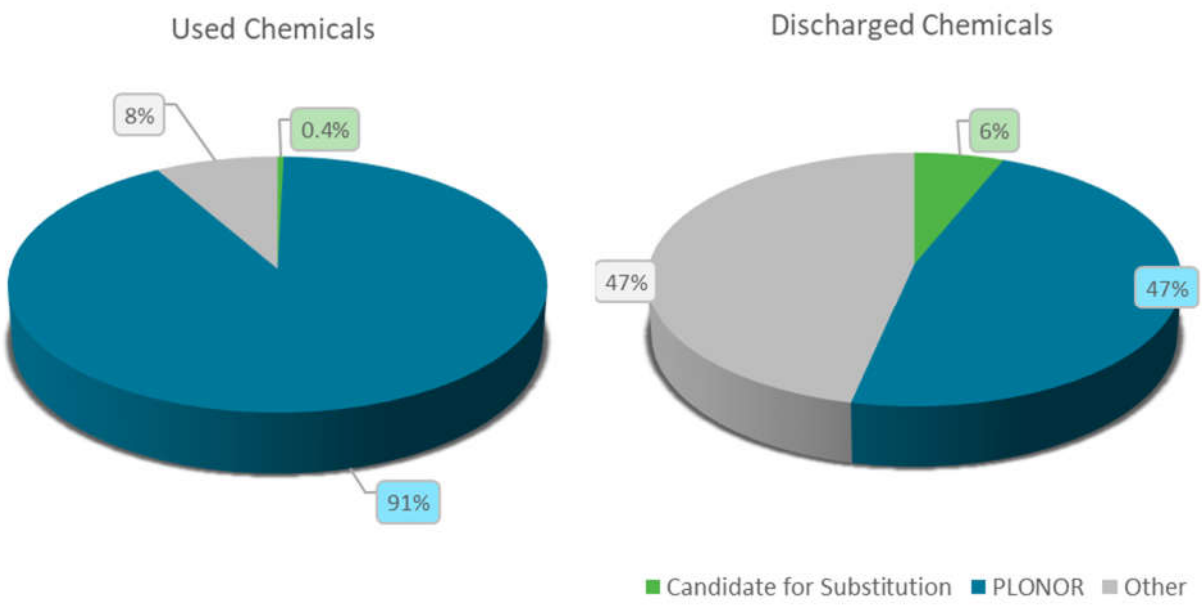
Figure 4.6: Chemicals Used and Discharged in Production Operations



Chemical use for gas production is dominated by the need for hydrate inhibition. Mono Ethylene Glycol (MEG) is routinely used for this purpose. It is a PLONOR chemical and it is usually recovered, recycled or reused unless its salinity precludes this in which case it is discharged offshore with the associated corrosion inhibitor with which it is dosed. Modelling indicates that the discharge presents a negligible risk to the environment. MEG accounted for approximately 69 percent of all chemicals used and < 1 percent of all chemical discharged during production in 2017.

Figure 4.7 presents the percentage of the total chemicals used and discharged that were identified as candidates for substitution or as PLONOR.

Figure 4.7: Percentage of Chemicals Used and Discharged in Production Operations Identified as PLONOR and ***Candidates for Substitution***



During 2017, the majority of the chemicals used in production operations were PLONOR. Only four chemicals identified as candidates for substitution were used in production operations, with a total use of 11,821 kg and discharge of 10,921 kg.

PUK is continuing to reduce chemical use at our Southern North Sea production assets, focusing on phasing out the use and discharge of chemicals with substitutional warnings.

4.3.2 Other Operations

During 2017, Seafox 2 was commissioned to support the Ravenspurn North ST3 well intervention works. In addition, the Rowan Gorilla VII (drilling rig) was contracted for the Ravenspurn ST2 drilling campaign, which began in November 2016.

Figure 4.8 presents a breakdown of the total chemicals used and discharged for all our Well Intervention operations in the Southern North Sea by OCNS colour band / grouping.

Figure 4.8: Chemicals Used and Discharged in Well Intervention Operations

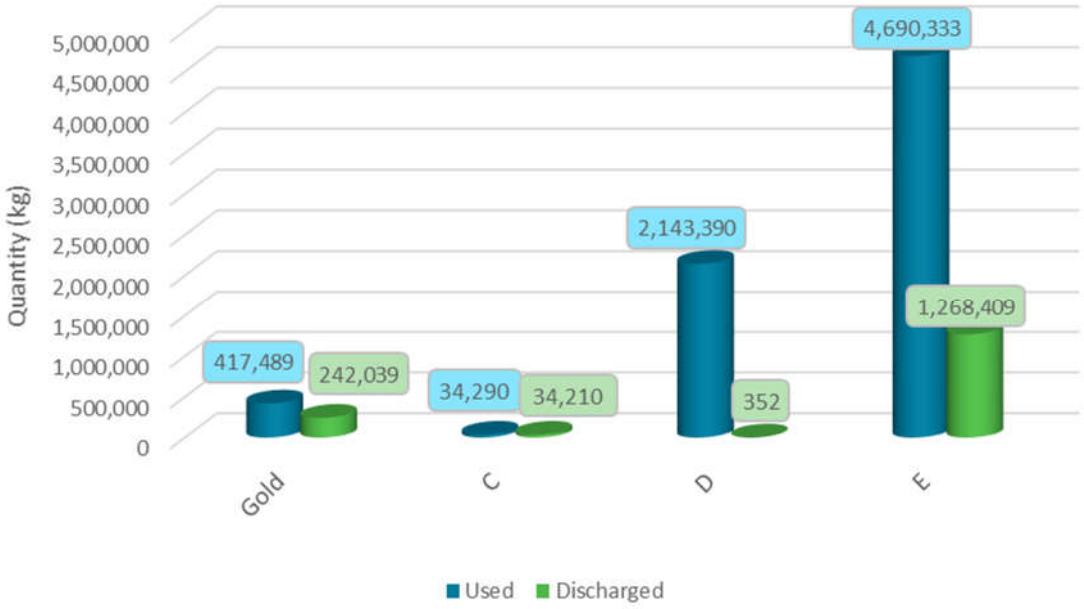
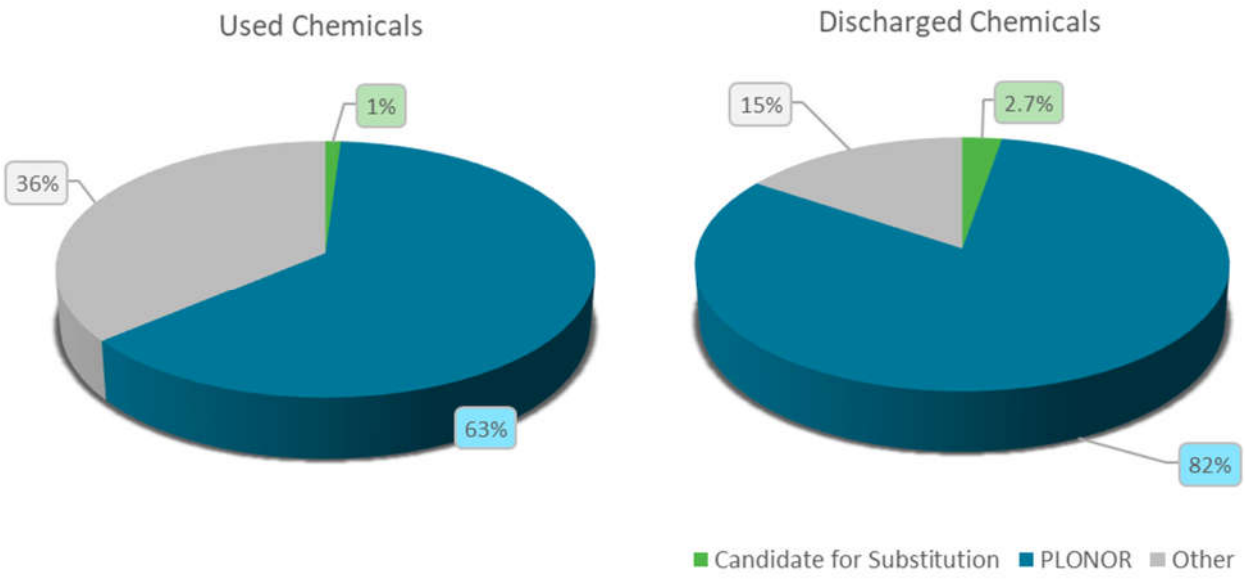


Figure 4.9 presents the percentage of chemicals used and discharged during Well Intervention operations that were identified as candidates for substitution or as PLONOR. A total of 7,285,501 kg of chemicals were used and 1,545,010 kg of these chemicals were discharged during other operations.

Figure 4.9: Percentage of Chemicals Used and Discharged in Well Intervention Operations Identified as PLONOR and Candidates for Substitution



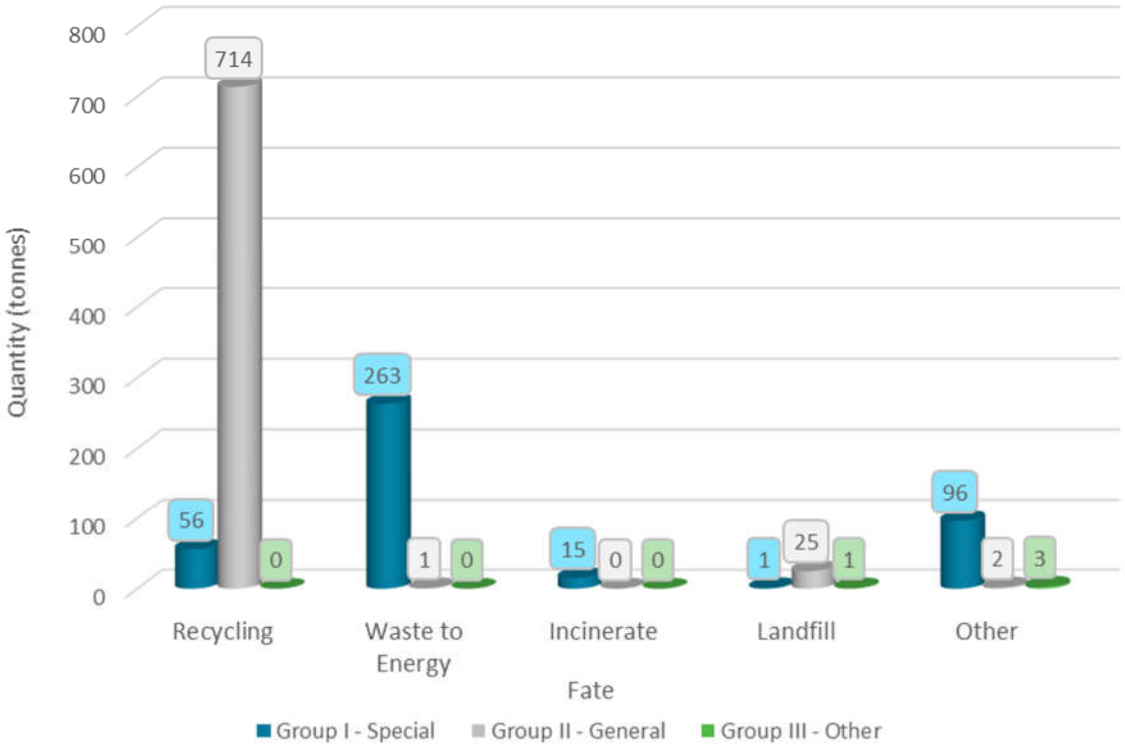
The majority of the chemicals used and discharged on Rowan Gorilla VII and Seafox 2 were PLONOR. Thirteen chemicals identified as candidates for substitution were used and 7 were discharged.

4.4 Waste

4.4.1 Production Operations

During 2017, waste was generated during production operations at 24 of our offshore Southern North Sea assets. Figure 4.10 presents the fate of each waste category for offshore production operations. None of the waste generated from the production operations was reused.

Figure 4.10: Fate of Each Waste Group for Production Operations



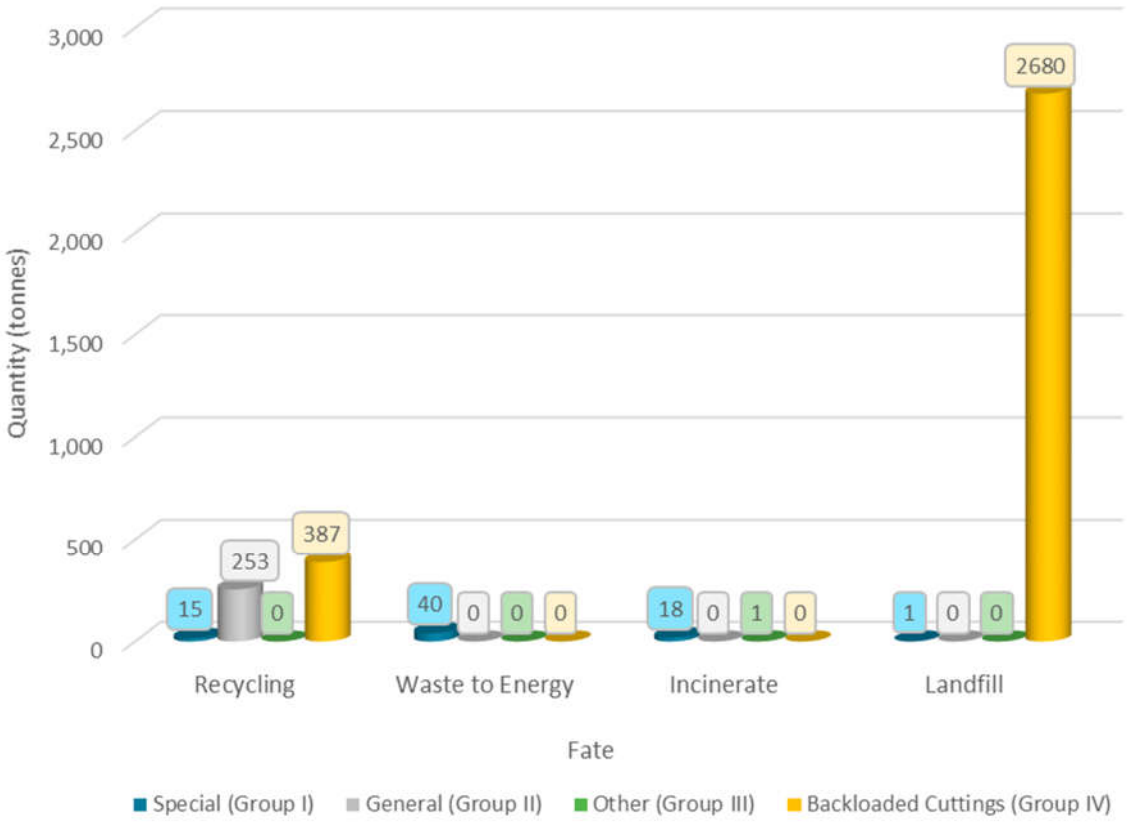
PUK assets generated a total of 1,176 tonnes of waste from offshore production operations in 2017. Approximately 98 percent was recycled or otherwise managed, rather than being consigned to landfill. Only 1 tonne of the 431 tonnes of special waste was sent to landfill. The quantity of waste recorded as 'other' was sent for treatment or noted as being general or special waste.

4.4.2 Other Operations

During 2017, Seafox 2 was commissioned to support the Ravenspurn North ST3 well intervention works In addition, the Rowan Gorilla VII (drilling rig) was contracted for the Ravenspurn ST2 drilling campaign, which began in November 2016.

Figure 4.11 presents the fate of each waste group for drilling and other operations during 2017. None of the waste generated from drilling and other operations were reused.

Figure 4.11: Fate of Each Waste Group for Drilling and Other Operations



A total of 6247 tonnes of waste was generated from drilling and other operations during 2017. Approximately 57 percent was recycled or otherwise managed, rather than consigned to landfill. Approximately 0.7 tonnes of special waste was sent to landfill.

4.5 Hydrocarbon and Chemical Spills to Sea

The Oil Pollution and Control Regulations apply to hydrocarbon and chemical spills to sea and these have to be reported and are subject to detailed investigation to ascertain the cause and prevent recurrence. A total of 26 spills were reported during 2017. Brief details of the hydrocarbon and chemical spills are provided in Table 4.2. Figure 4.12 shows the majority of substances spilt were hydrocarbons (89 percent), primarily from an accidental release at Waveney.

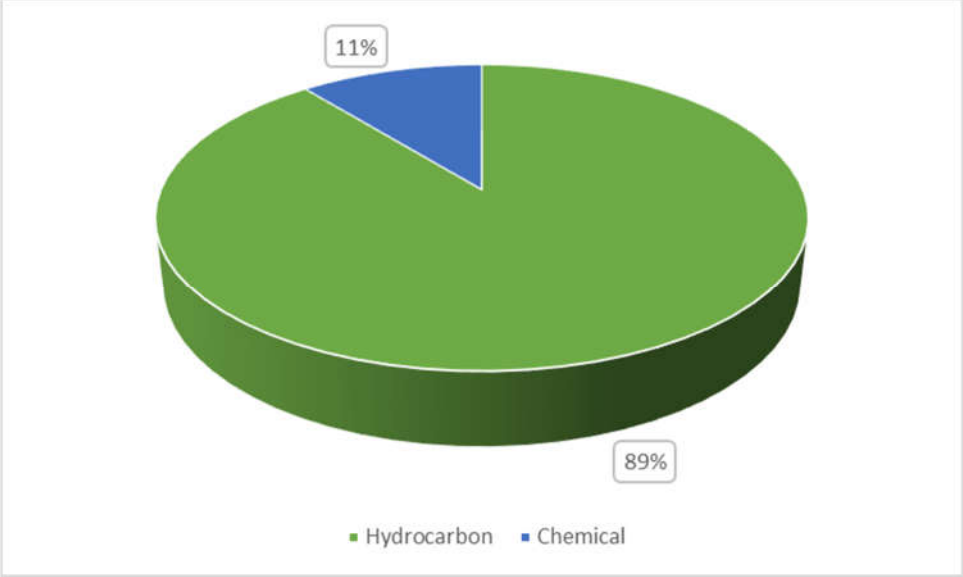
Table 4.2: Hydrocarbon and Chemical Spills to Sea

Location	Date	Description	Loss	
			Hydrocarbon (kg)	Chemical (kg)
Cleeton	31/03/17	Failure of hydraulic supply tube fitting	-	94
	30/10/17	Failure of hydraulic supply line. Aqualink lost to sea		94
Excalibur	03/05/17	Failure of accumulator charging valve and bladder	-	150
Guinevere	22/12/17	Hose failure	0.17	-

Location	Date	Description	Loss	
			Hydrocarbon (kg)	Chemical (kg)
Inde 23A	12/05/17	Diesel accidentally spilled during bunkering due to human error.	2	-
	27/07/17	While bunkering MEG the tank was overfilled due to a level gauge indicator malfunction	-	800
	21/09/17	Pierced cellar deck	0.025	-
	24/10/18	Leak from suction header	3.6	-
Inde AQ	04/02/17	Diesel traces on deck washed overboard during AQ fire pump weekly test	0.06	-
Inde CD Platform	27/01/17	Diesel leak from the 5mm vent port located on top of the AQ fire pump diesel storage tank sight glass	8.85	-
	07/08/17	While needle gunning the corrosion from a diesel line the line was broken causing diesel to leak to the deck	5	-
Lancelot	20/09/17	Failure of hydraulic system pilot valve	5	-
Leman 27c	01/10/17	Actuator failure	2	-
Leman D	14/07/17	The O ring joint between the gearbox and flange plate became loose due to vibration resulting in an oil spill	1	-
Leman FP	05/04/17	Spill from diesel generator	250	-
	18/01/17	Faulty Hose resulting in loss of oil	10	-
Pickerill A	08/08/17	Leak of Aqualink from BDV 020 actuator to sea		500
Ravenspurn North	12/05/17	Failed diesel solenoid valve	0.5	-
	05/08/17	Damaged bunkering hose	0.54	-
	30/08/17	Leaking pipework flange	0.02	-
Rowan Gorilla	28/01/17	Droplets of base oil condensing from hot vapours being blown through discharge vent	-	0.4
	30/07/17	Top Drive (TDS) saver sub failed. OBM		163
ST2	19/02/17	Loose instrument fitting	6.6	-

Location	Date	Description	Loss	
			Hydrocarbon (kg)	Chemical (kg)
Thames	23/06/17	During heavy lift operations of the separation of the AP topside some residue diesel drained from some cut pipework.	5	-
Tyne - Sf1	04/09/17	Cooking oil accidentally disposed of to sea	0.08	-
Waveney	09/11/17	Hole made in the hazardous drains tank by accident.	1333	-
Total			1344.68	163.4

Table 4.12: Overview of Substances Spilt (as a Percentage of the Total Amount Spilt)



5 Environmental Objectives and Targets for 2018

Based on PUK's planned UKCS operations for 2017, PUK has developed environmental objectives and targets for 2018, as shown in Table 5.1.

Table 5.1: Environmental Objectives and Targets for 2018

Aspect	Objective
Emissions of Carbon Dioxide (CO2)	Retain CO2 emissions within allocations set for permitted installations
Emissions of Hydrocarbon (HC) Gases	Identify opportunities for the reduction in HC venting
Emissions of Other Combustion Products	Monitor and where reasonably practicable reduce oxides of nitrogen (NOx) emissions from relevant combustion equipment
Discharge of Oil in Produced Water	Ensure the monthly average concentration of oil discharged in produced water does not exceed the platform allowance
Discharge of Production Chemicals	Reduce the use and/or discharge of production /drilling / well intervention chemicals that carry substitution warnings
Hydrocarbon and Chemical Spills to Sea	<10 reportable spills (N.B. Any spill to sea, irrespective of size, is reported to the regulator, BEIS)