2015

OSPAR Public Statement

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Abbreviations

°C	Degrees Celsius
µm	Micrometre
boepd	Barrels of Oil Equivalent Per Day
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CH_4	Methane
CHARM	Chemical Hazard and Risk Management
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DECC	Department of Energy and Climate Change
ETS	Emissions Trading Scheme
HC	Hydrocarbon
HQ	Hazard Quotient
HSE	Health and Safety Executive
HSSE	Health, Safety, Security and Environment
kg	kilogram
mg/kg	Micrograms per Kilogram
MW(th)	Megawatt Thermal
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxides
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PEC:NEC	Ratio of Predicted Effect Concentration against No Effect Concentration
PLONOR	Poses Little or No Risk to the Environment
POMS	PUK Operating Management System
P.S.V	Pressure Safety Valve
PUK	Perenco UK Limited
SCM	Subsea Control Module
SEMS	Safety and Environmental Management System
SO_2	Sulphur Dioxide
SUB	Candidate for Substitution
t	Tonne
VOC	Volatile Organic Compounds

1 Introduction

The Department of Energy & Climate Change (DECC) 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.

This report outlines Perenco UK Limited (referred to hereafter as 'PUK') environmental performance for its UK Continental Shelf (UKCS) operations during 2015. The report is structured as follows:

- Section 2 describes the company's activities in the UKCS during 2015.
- Section 3 provides a summary of the ISO 14001-certified Safety and Environmental Management System (SEMS) that provides the framework for the control of the environmental impacts from production activities.
- Section 4 describes PUK's environmental policy and the environmental objectives and targets that were set in 2015 for significant environmental aspects and impacts.
- Section 5 summarises PUK's performance during 2015 in relation to the environmental policy, objectives and targets, and relevant legislative requirements.

2 Perenco UK Limited SNS UKCS Operations

PUK has been an operator in the southern North Sea since September 2003. Offshore, PUK is responsible for seven installations that are classified as "manned" (Indefatigable 23A & 23C, Thames 28A, Leman 27A, Cleeton, Ravenspurn North CPP, West Sole Alpha), 38 normally unattended installations (NUIs) and 14 subsea installations producing gas and liquids that are tied-back through pipelines to the onshore gas terminals Dimlington, Theddlethorpe and Bacton.

Figure 2.1: PUK Southern North Sea Installations

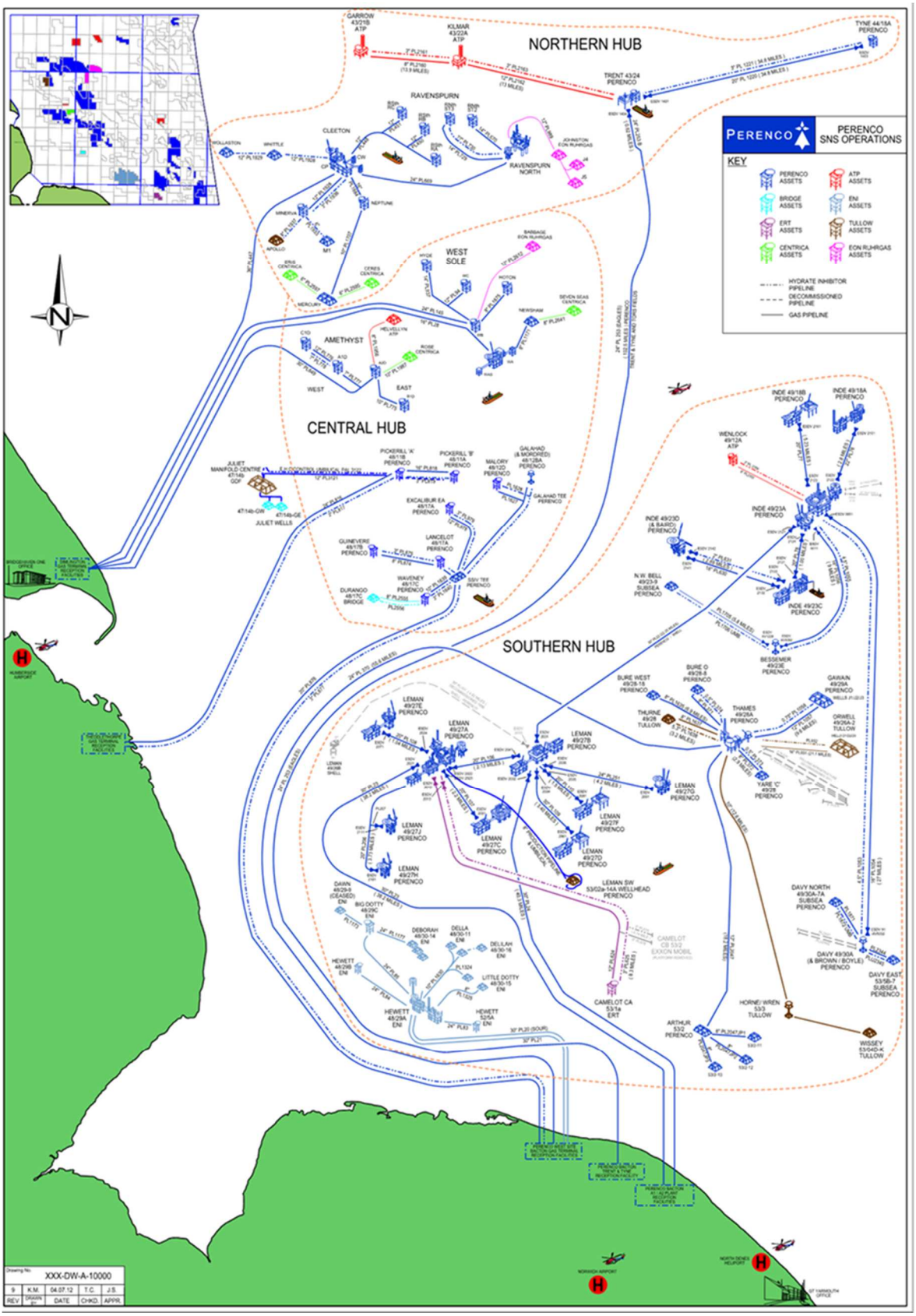


Table 2.1 lists PUK's Southern North Sea installations and their production status including those assets that are being decommissioned. All PUK-operated assets were producing during 2015 with the exception of Thames, Arthur, Bure O, Bure West, Gawain and Yare 'C', which were being decommissioned.

Table 2.1: PUK Southern North Sea Installations

Installation	UKCS Block	Type	Status in 2015
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	Produced
Durango	48/21	Subsea	Produced
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

Installation	UKCS Block	Type	Status in 2015
Leman 27G	49/27	NUI	Produced
Leman 27H	49/27	NUI	Produced
Leman 27J	49/27	NUI	Produced
Leman SW	53/02	Subsea	Produced
M1	47/04	Subsea	Produced
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
Thames 28A	49/28	Manned	No production *
Trent	43/24	NUI	Produced
Tyne	44/18	NUI	Produced
Waveney	48/17	NUI	Produced
Welland	49/29 & 53/04	Subsea	No production *
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 *

* Undergoing decommissioning.

2.1 PUK UKCS SNS Activities

In addition to production operations, PUK undertook the following offshore projects in the Southern North Sea during 2015:

- **Hoton 2 well drilling campaign**: Deployment of drilling rig (GSF Monarch) to drill the Hoton 2 well (48/07b-E) at the Hoton platform (27th October 2014 – 17th March 2015) and accommodation barge (Seafox 1) to undertake a maintenance programme to tie-in the Hoton 2 well (12th May 2015 – 27th June 2015);
- **Leman SW pipeline installation**: Installation of the pipeline (PL3731) and umbilical (PLU3732) (mid-December 2014 – March 2015);
- **Thames decommissioning programme**: Decommissioning of seven pipelines; PL370, PL371, PL372, PL1057 & PL1058, PL1635, PL1637 and PL2047 (24th September 2014 – 30th April 2015);
- **West Sole Alpha maintenance programme**: Deployment of jack-up barge (Seafox 1) to undertake a maintenance programme on the platform (31st August 2014 – 11th May 2015);
- **Leman maintenance programme**: Deployment of jack-up barge (Seafox 7) to undertake a maintenance programme on the host installation, Leman 27AP (mid-April 2014 – 31st April 2015);
- **Inde maintenance programme**: Deployment of jack-up barge (Seafox 1) to undertake a maintenance programme on the host installation, Inde 23A (28th June 2015 – 18th May 2016).

Some of the operations listed above either commenced during 2015 or were completed early 2016. This OSPAR Public Statement only includes data reported via the online Environmental and Emissions Monitoring System (EEMS) during 2015.

3 PUK Safety and Environmental Management System

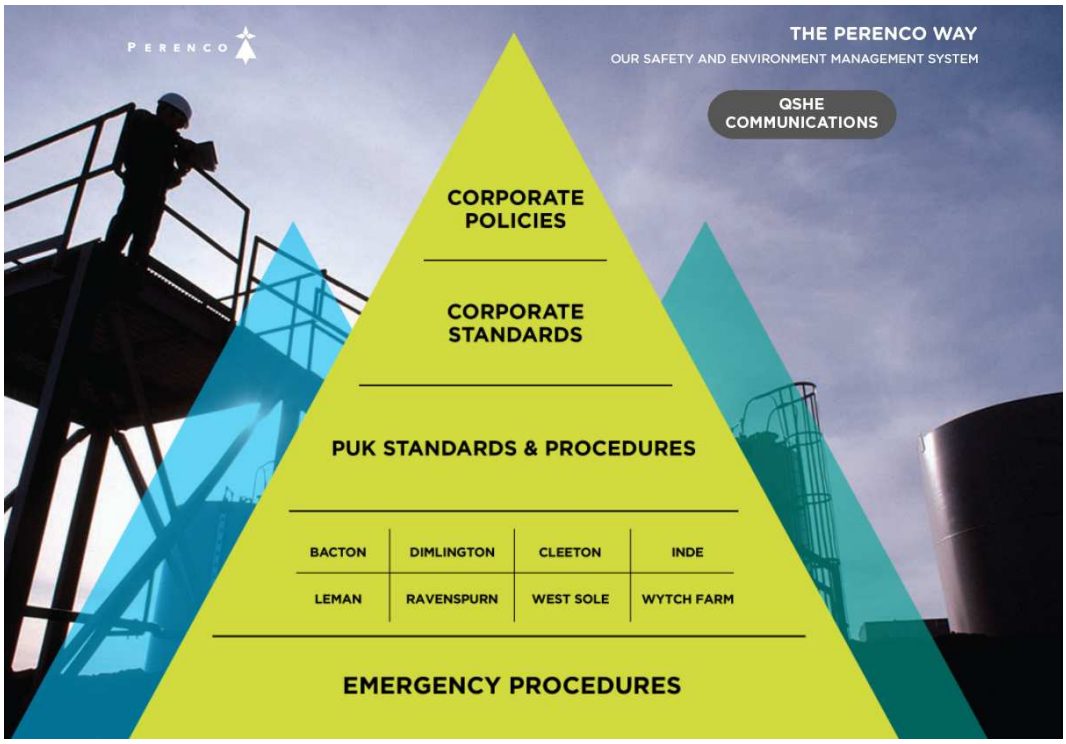
PUK operate under a Safety and Environmental Management System (SEMS), certified to ISO 14001. The PUK SNS SEMS provides a uniform approach to every element of operations across SNS assets. With regards to health, safety, security and environmental management the purpose of the SEMS is to ensure that, 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 SEMS



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

3.1 The Environmental Policy

PUK's Environmental Policy is reproduced below (refer to Figure 3.). It informs the definition of our significant environmental aspects that are the focus of our environmental management activities.

Figure 3.2: PUK Environmental Policy

3.2 Environmental Aspects and Objectives

PUK's significant routine environmental aspects and associated objectives for their offshore operations during 2015 are presented in Table 3.1.

Table 3.1: Environmental Aspects & Objectives for 2015

Aspect	Objective	Status
Emissions of Carbon Dioxide (CO_2)	Retain CO_2 emissions within allocations set for permitted installations	Partially achieved – achieved on one of the five permitted installations
Emissions of Hydrocarbon (HC) Gases	Identify opportunities for the reduction in HC venting	The process is on-going
Emissions of Other Combustion Products	Monitor and where reasonably practicable reduce oxides of nitrogen (NO_x) 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 nine of the twelve installations
Discharge of Production Chemicals	Reduce the use and/or discharge of production chemicals that carry substitution warnings	Achieved – only 4 production chemicals carrying substitution warnings were used
Hydrocarbon and Chemical Spills to Sea	<6 reportable spills (N.B. Any spill to sea, irrespective of size, is reported to the regulator, DECC)	Not achieved - a total of 25 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 spill incidents. This section presents the information that was reported via the online Environmental and Emissions Monitoring System (EEMS) for operations undertaken during 2015.

4.1 Atmospheric Emissions

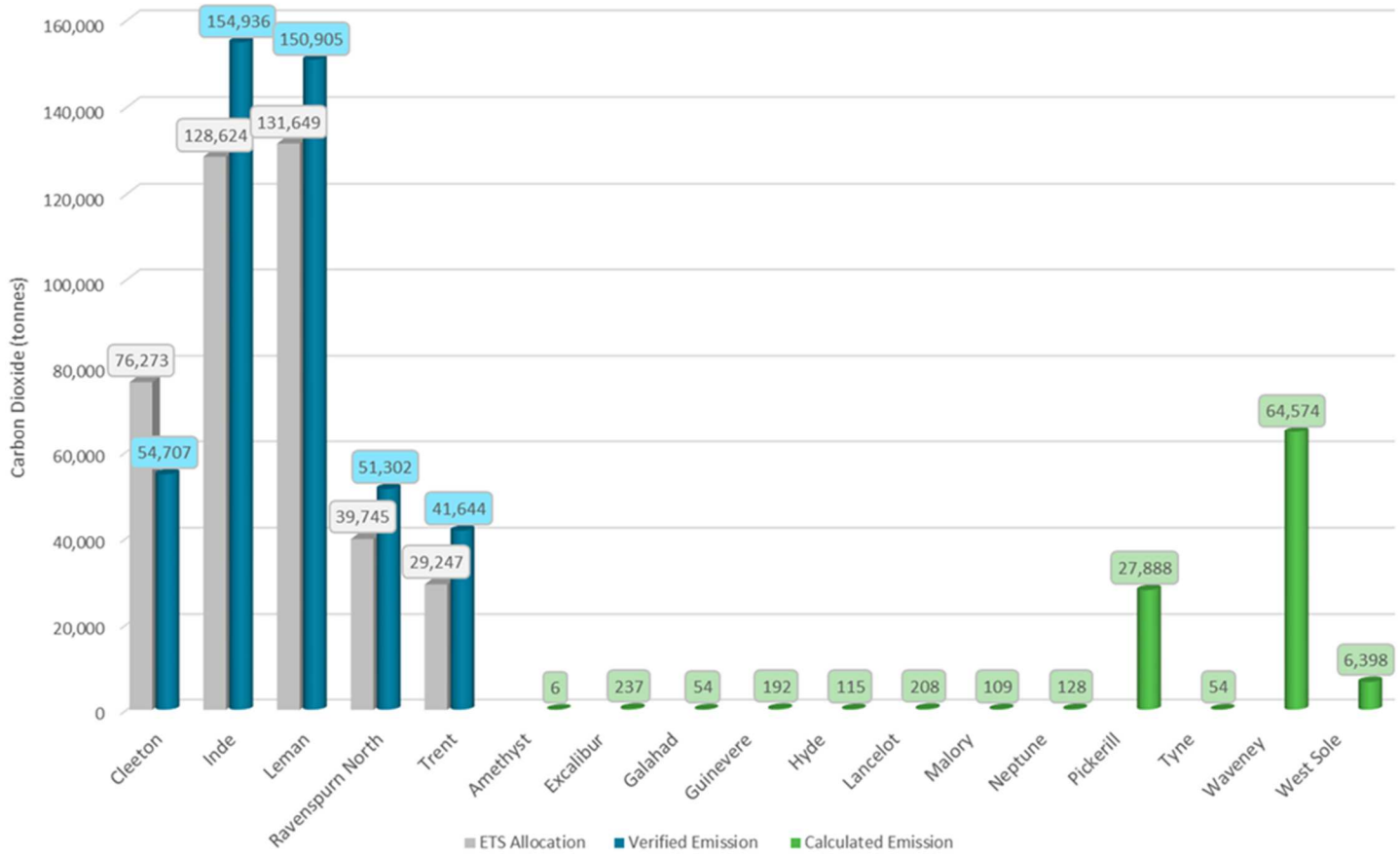
4.1.1 Production Operations

Emissions from Fuel Combustion

Carbon dioxide (CO_2) emissions from six 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 Ravenspurn North; Cleeton; Inde 23A; Leman 27A; Thames and Trent and we seek to ensure that our emissions remain within these allocation limits.

Figure 4.1 shows PUK's verified and calculated CO_2 emissions from fuel combustion associated with production operations for 2015 together with the corresponding EU ETS allowance (where relevant). Thames 27A was undergoing decommissioning during 2015 and therefore had no CO_2 allocation or emissions from production operations.

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

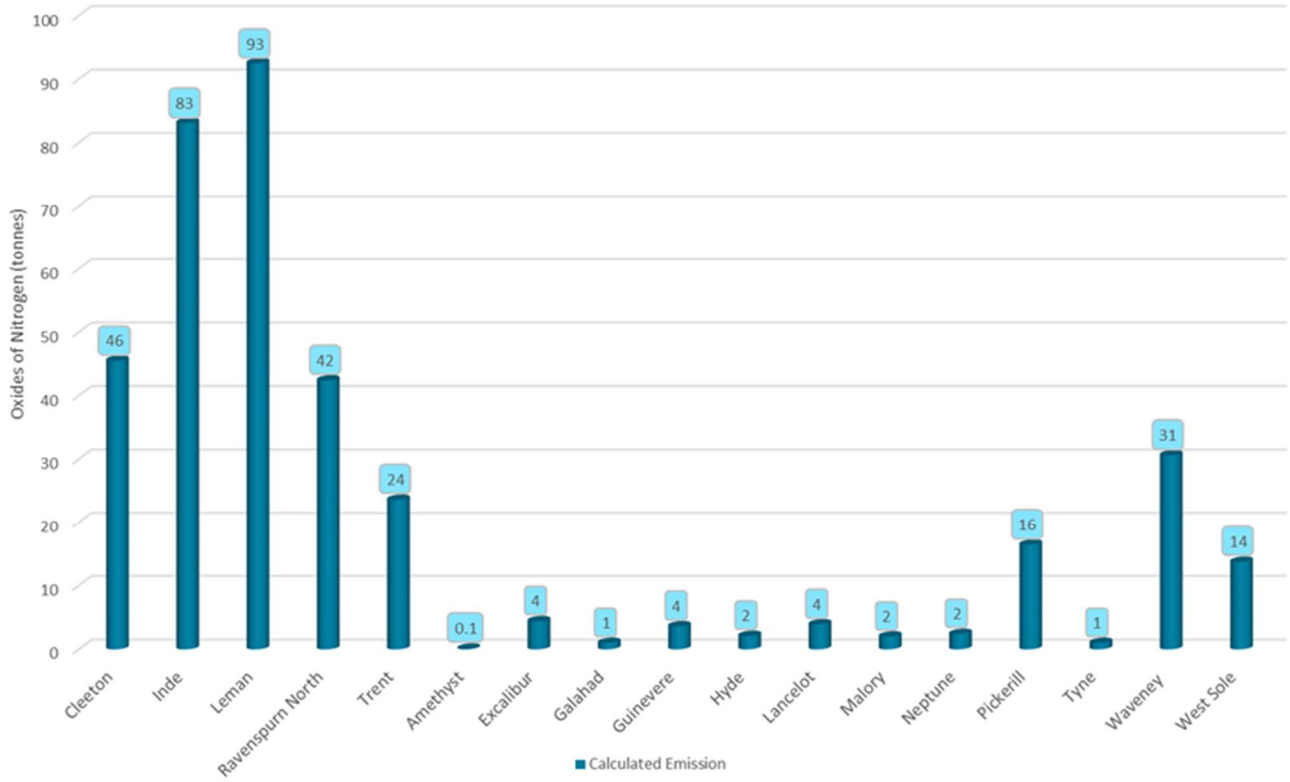


During 2015 a total of 553,458 tonnes of CO_2 were emitted to the atmosphere from all of our southern North Sea assets. Five of our offshore installations, which are subject to control under the Greenhouse Gases ETS, (Indefatigable, Leman, Ravenspurn North, Cleeton and Trent) had emissions of CO_2 that were greater than their allocated ETS allowance). Overall the CO_2 emissions from these installations were 47,956 tonnes over the total ETS allocation across the installations. The CO_2 emissions from these four installations are similar to those reported during previous years however, the European Union Emission Trading Scheme (EU ETS) is now in its third phase and does not allocate a free allowance for the generation of electricity as the preceding phases did. Indefatigable, Leman, Ravenspurn North and Trent installations all generate their own electricity and consequently their allowance has been significantly reduced, while the operations and equipment on board have remained unchanged.

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

Figure 4.2 presents the calculated NO_x emissions from fuel combustion associated with production operations during 2015.

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



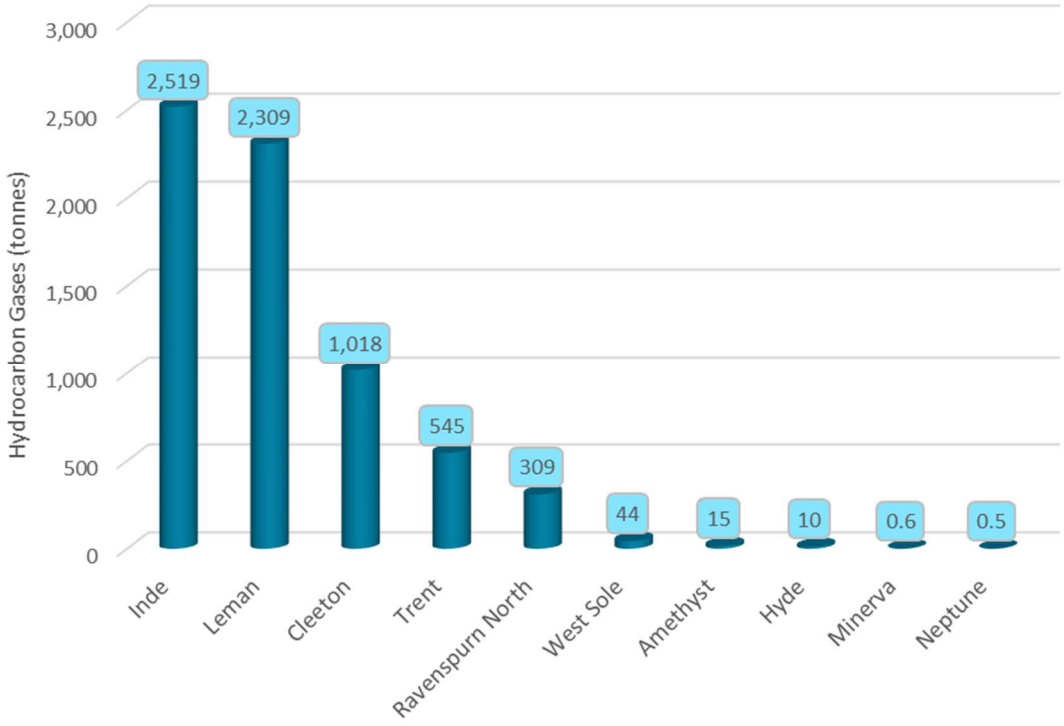
During 2015 the NO_x emissions from these five installations was 287 tonnes). The small proportion of total loading from the offshore oil and gas industry means that the environmental effects of the NO_x emissions from PUK's southern North Sea assets are minimal and the cost of retrofitting NO_x emission combustion equipment is prohibitive in the circumstances of declining oil fields and ageing assets.

4.1.2 Emissions of Hydrocarbon Gases

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

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

Figure 4.3: Hydrocarbon Gas Emissions Associated with Production Operations



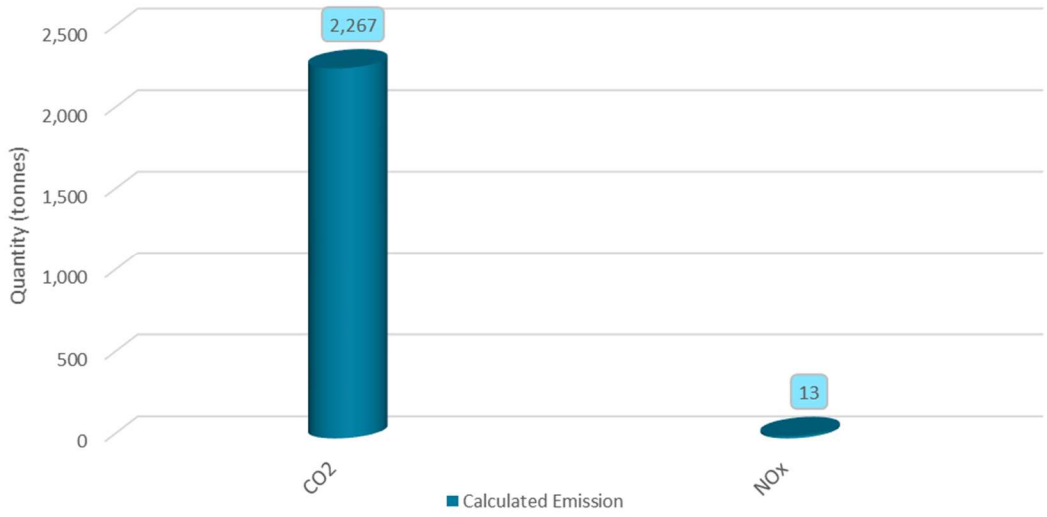
During 2015 a total of 6,769 tonnes of hydrocarbon gases were emitted into the atmosphere from our southern North Sea assets. Perenco UK will continue to investigate potential opportunities to reduce the CO_2 and other gaseous emissions from all of our installations, and in particular Indefatigable, Leman, Ravenspurn North and Trent.

4.1.3 Drilling and other Operations

Emissions from Combustion

The Hoton 2 well drilling campaign required the combustion marine diesel fuel on board the GSF Monarch drilling rig and the flaring of hydrocarbon gas during well testing. Figure 4.4 presents the calculated total CO_2 and NO_x emissions associated with these activities.

Figure 4.4: Calculated Carbon Dioxide and of Nitrogen Oxide Emissions for Fuel Combustion Associated with Drilling and other Operations



During 2015 2,267 tonnes of CO_2 and 13 tonnes of NO_x were emitted into the atmosphere from our non-production activities including drilling.

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 is currently discharged from 12 of our assets in the southern North Sea. The volume of produced water discharged from each asset during 2015 is presented in Figure 4.5 and the monthly flow-weighted average concentration of oil in produced water for each asset along with the consented limit are presented in Figure 4.6. Please note, there are produced water re-injection systems at Cleeton and Leman.

Figure 4.5: Discharged Produced Water

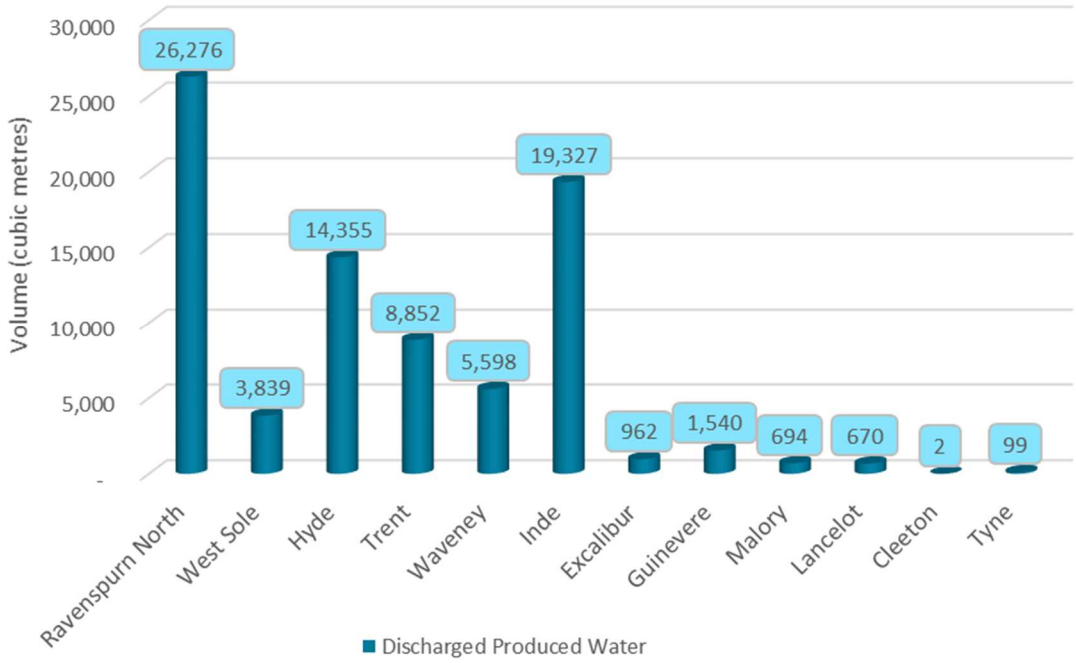
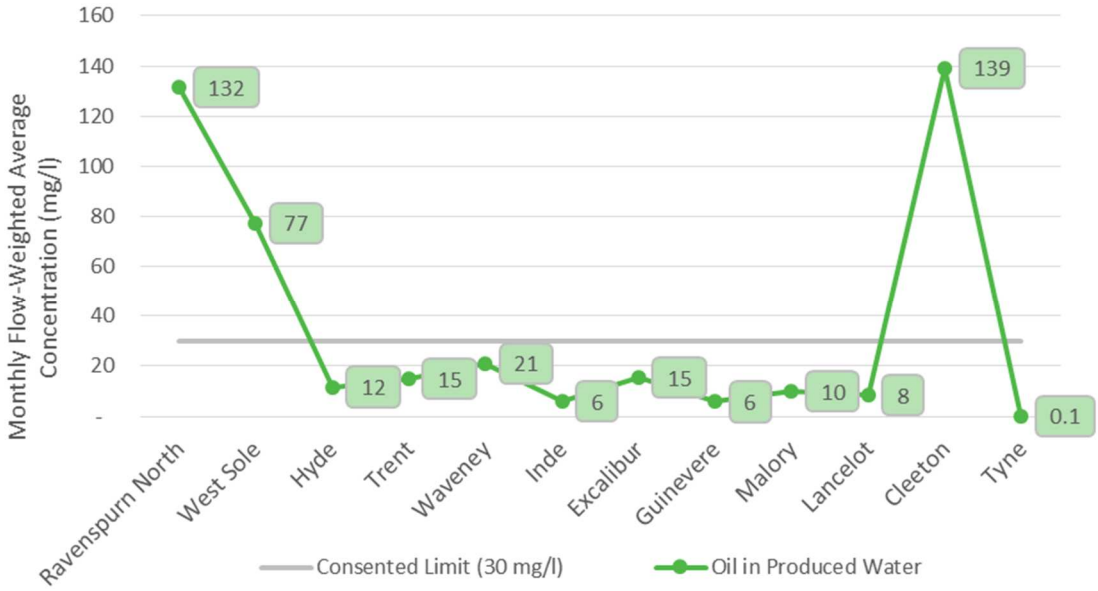


Figure 4.6: Monthly Flow-Weighted Average Concentration of Oil in Produced Water



During 2015 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 (Ravenspurn North, West Sole Alpha and Cleeton). Further details are provided below.

Ravenspurn North

The Ravenspurn North installation has two produced water steams; one associated with Johnston and the other with Ravenspurn North. Cumulative discharge of hydrocarbons from these produced water streams account for approximately 80 percent of total hydrocarbons discharged with produced water for all of PUK's southern North Sea assets. PUK is aware that for all months during 2015 the oil in produced water concentration for both streams was significantly higher than the permitted limit increasing the monthly average above the consented 30 mg/l.

When PUK acquired Ravenspurn North installation (1st November 2012) the average oil in produced water concentration was 545 mg/l. The TORE wash system was brought online at the end of 2014 and the intent was to improve efficiency of the hydrocarbon-produced water separation.

From around February 2015 we have seen a change in the liquid stream characteristics as a result of our attempts to optimise Ravenspurn North production. This has seen a significant reduction in the amount of fluids produced, to the point of almost zero when the Johnston subsea tieback is offline. This fluctuation in water volumes has resulted in an inefficiency in the performance of the CETCO skid. This requires manual interventions to drain the system and change out of the CETCO filters have been timed around increasing oil in produced water readings from the DECC sample point.

The flow weighted average concentration of oil in produced water on Ravenspurn North (combined Ravenspurn North and Johnston streams) was 132 mg/l during 2015.

PUK has been exploring a number of options to improve produced water quality. The re-injection of produced water into a disposal well at Ravenspurn North was trialled during 2014 but proved to be unsuccessful. We are currently evaluating the options of (1) modifying the produced water process and (2) exporting produced liquids (condensate and produced water) to Cleeton. We are also exploring the option of introducing seawater upstream of the CETCO unit to bring the fluids back to original design to maintain a steady flow of water through the unit, which we believe would improve its performance. In addition to these engineering studies, we are actively pursuing the opportunity to undertake a sampling campaign to identify potential benefits of injecting chemicals into the upstream process to enable more effective filtration and/or separation. PUK is committed to find a viable solution during 2016.

In addition to oil in produced water, oil on sand /scale was also discharged from the Ravenspurn North installation during 2015. Approximately 0.7 tonnes of sand / scale was discharged with an average oil concentration of 2,857 micrograms per kilogram (mg/kg), releasing approximately 2 kg of oil into the marine environment.

West Sole Alpha

PUK is aware that the discharged oil in produced water concentration at West Sole Alpha was significantly higher than the permitted amount, exceeding the monthly average over the consented 30 mg/l for all months during 2015.

The average oil in produced water concentration for the five years preceding PUK's acquisition of the West Sole Alpha installation was 131 mg/l. It appears that the existing produced water separator installed was not designed to meet the permitted 30 mg/l limit, and therefore requires technical upgrades.

During 2015 PUK undertook maintenance works on the produced water separator with the aim of increasing the residence time of produced water in the separator. Repairs to the level control value, in April 2015, were initially effective in reducing the oil in produced water concentration to below 30 mg/l however shortly afterwards levels continued to be above this limit. We are currently awaiting a new level control valve.

The flow weighted average concentration of oil in produced water on West Sole Alpha during 2015 was 77 mg/l.

Further to the above, we have undertaken water clarifier trials (in early 2016) to determine if the addition of a chemical would be a solution. In addition, we are planning to undertake an internal inspection of the produced water separator, coalesce and cyclone package during the 2016 shutdown. Repairs would be scheduled at the earliest opportunity should it be required.

PUK will consider alternative engineering/process solutions if these two options prove ineffective. These are likely to consist of; (1) assessing the potential for the re-injection of produced water, (2) installing a water treatment package downstream of the separator and (3) bypassing the separator and sending liquids (condensate /produced water) directly the Dimlington Terminal for separation, treatment and onward disposal.

Cleeton

The Cleeton installation has two produced water streams; one associated with Cleeton and the Easington Catchment Area (comprising Neptune, Mercury, Eris, Ceres, Minerva, Apollo, Wollaston, and Whittle) and the other with Ravenspurn South. Under normal working conditions, both streams are disposed of via the produced water re-injection systems on Cleeton and re-injected into the Cleeton reservoir.

During 2015, 100 percent of the produced water associated with the Cleeton and Easington Catchment Area was re-injected back into the reservoir. However, for the Ravenspurn south stream there were two months when re-injection was not achieved and produced water was discharged to sea, however the total volume discharged was less than 2 m^3. Despite the high flow weighted average oil in water concentration (139 mg/l), the discharge of hydrocarbons in produced water from the Cleeton installation was negligible (0.2 kg).

PUK is actively seeking to reduce these discharges by having back-up pumps and planned maintenance procedures in place, to further minimise the time that produced water is discharged to sea. There is also a study on-going that is looking at upgrading the produced water re-injection system (to allow an increase in injection rates).

PUK is committed to finding a solution that will meet its permitted discharge thresholds.

4.2.2 Drilling and other Operations

Table 4.1 presents the amount of oil that was discharged to sea during drilling and other operations.

Table 4.1: Discharge of Oil in Cuttings During 2015

Operation	Quantity of Cuttings Discharged (t)	Concentration of Oil on Cuttings (mg/kg)
GSF Monarch - Hoton 2 well drilling campaign	40	14,945

Approximately 599 kg of permitted oil (reservoir hydrocarbons) was discharged to sea during the drilling of the Hoton 2 well.

In addition, approximately 0.22 kg of permitted oil was discharged to sea during the decommissioning of the Thames gas export pipeline (PL370).

4.3 Discharge of Chemicals

The use and discharge of chemicals is subject to control under the Offshore Chemicals Regulations. 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 that are 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 not applicable to the CHARM model (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.

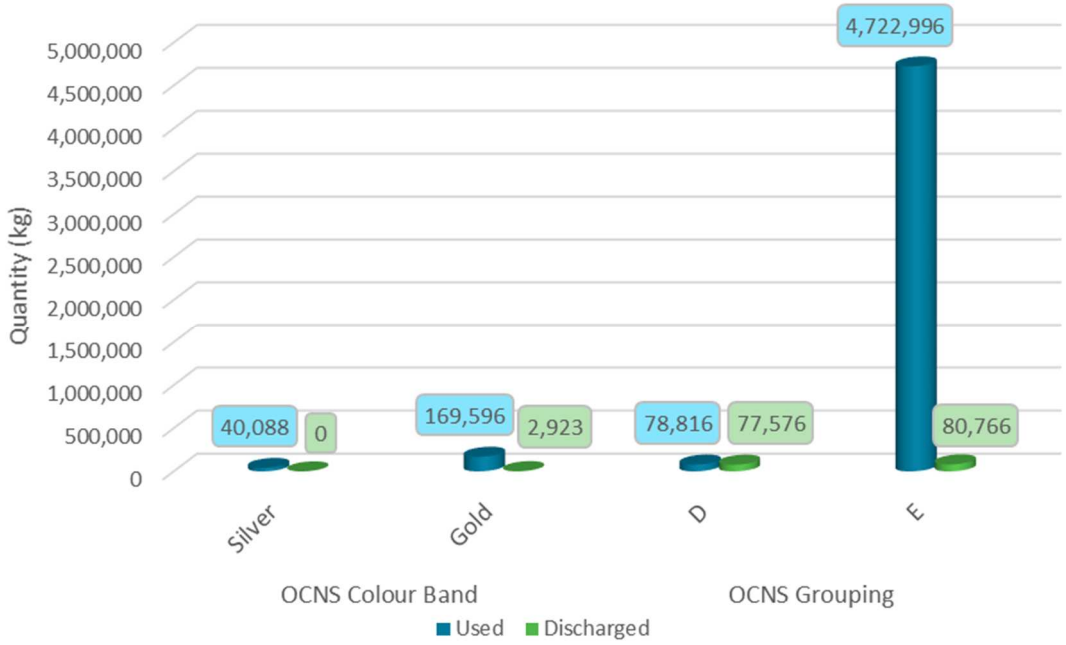
In addition to the OCNS colour bands and groupings, OSPAR identifies chemicals considered as 'PLONOR' and those considered harmful to the environment as 'candidates for substitution'. We actively seek to select chemicals without a substitution warning, however there are instances where a lack of a suitable alternative for technical or safety reasons, may require the use of chemicals with a substitution warning.

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, Inde, Leman, Lancelot, Pickerill, Ravenspurn North, Thames, Trent, and Tyne, West Sole Alpha, West Sole Bravo and West Sole Charlie installations.

Figure 4.7 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.

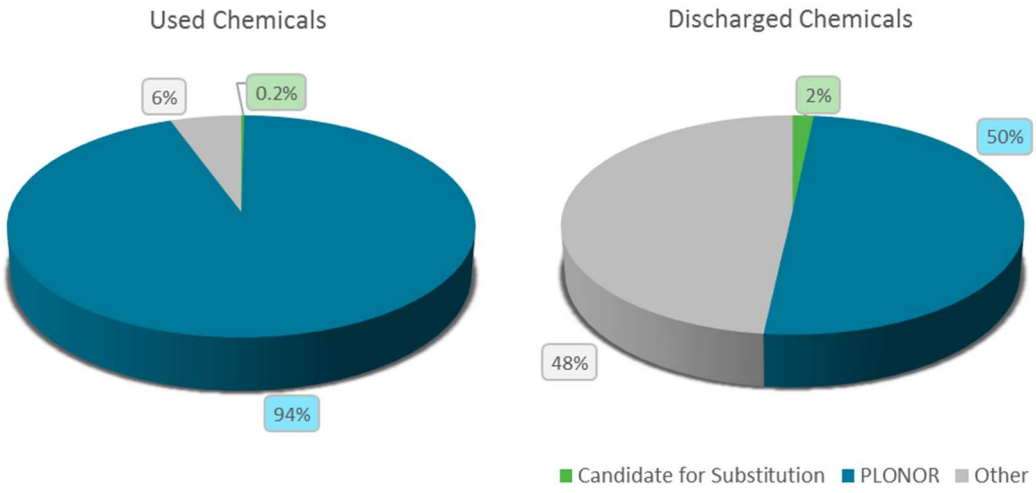
Figure 4.7: Chemicals Used and Discharged in Production Operations



Chemical use for gas production is dominated by the need for hydrate inhibition and Methanol is routinely used for this purpose. Methanol 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 this discharge presents a negligible risk to the environment. Methanol accounted for approximately 41 percent of all chemicals used and 19 percent of all chemicals discharged during production in 2015.

Figure 4.8 presents the percentage of the total chemicals used and discharged that were identified as candidates for substitution or as PLONOR.

Figure 4.8: Percentage of Chemicals Used and Discharged in Production Operations Identified as PLONOR and Candidates for Substitution



During 2015, the majority of the chemicals used and discharged in production operations were PLONOR. Only four chemicals identified as candidates for substitution were used in production operations, with a total use of 11,720 kg and total discharge of 2,698 kg. PUK is continuing to reduce chemical use at the southern North Sea assets, focussing on chemicals with substitution warnings.

4.3.2 Drilling and Other Operations

During 2015 chemicals were used and discharged during the Hoton 2 drilling campaign and pipeline operations on PL371 (decommissioning) and PL3731 (installation).

The drilling campaign required a range of chemicals to lubricate the drill bit and drilling assembly and facilitate the removal of rock fragments as well as provide pressure control in the well and to stabilise the formation. The largest quantities of chemicals discharged during the drilling operation were water-based drilling fluid additives and weighting agents, much of which are chemically inert.

Figure 4.9 presents a breakdown of the total chemicals used and discharged for all of our drilling & other operations in the southern North Sea by OCNS colour band / grouping. The majority of these chemicals are attributable to the drilling campaign.

Figure 4.9: Chemicals Used and Discharged in Drilling and Other Operations

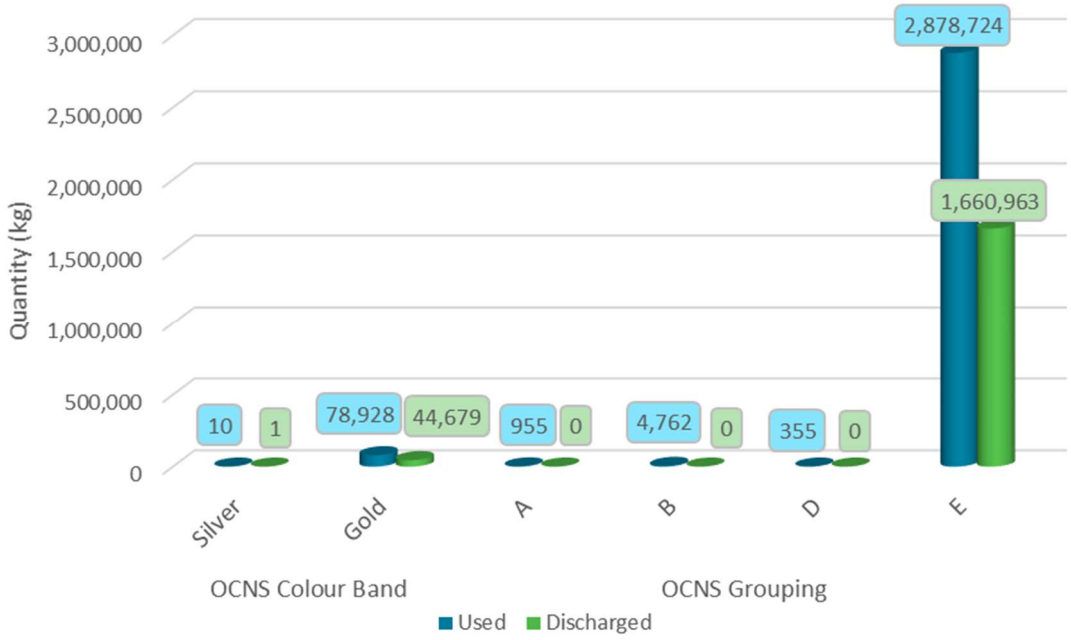
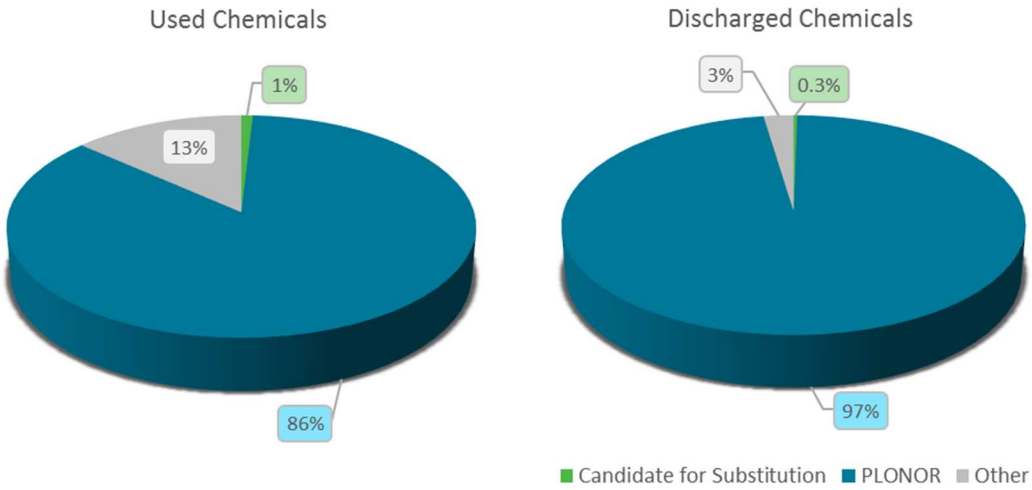


Figure 4.10 presents the percentage of chemicals used and discharged during drilling and production operations that were identified as candidates for substitution or as PLONOR. A total of 2,963,733 kg of chemicals were used and 1,705,643 kg of these chemicals were discharged during operations.

Figure 4.10: Percentage of Chemicals Used and Discharged in Drilling & Other Operations Identified as PLONOR and Candidates for Substitution



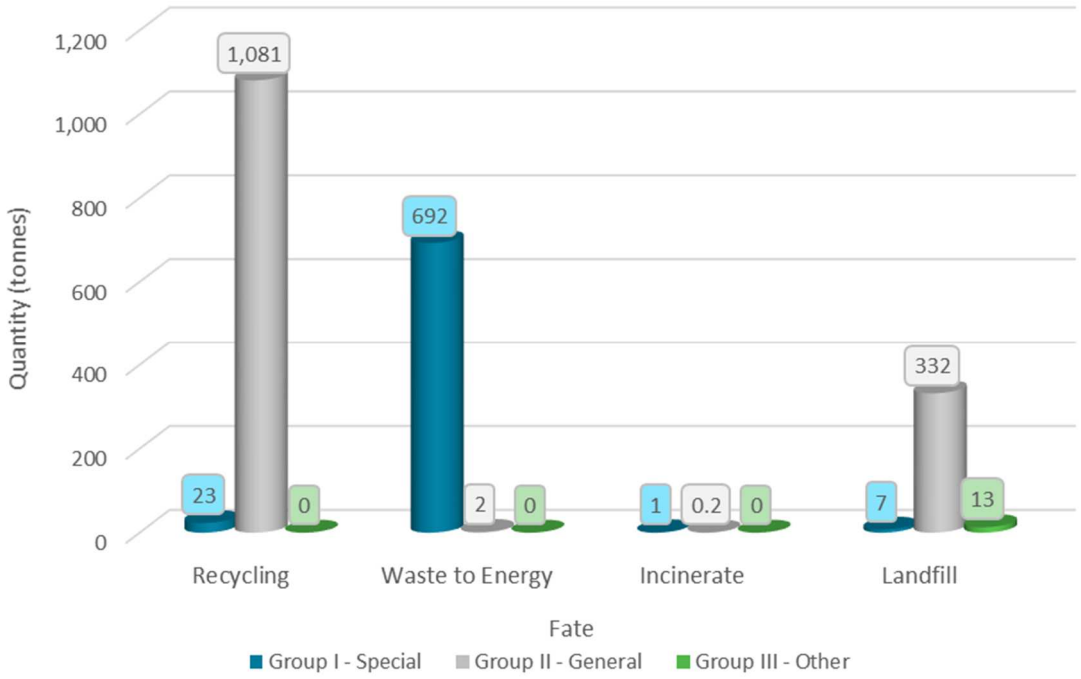
During 2015, the majority of the chemicals used and discharged in drilling and other operations were PLONOR. Only 4 of the 11 chemicals identified as candidates for substitution were discharged and contributed to 0.3 percent of the total volume of chemicals discharged.

4.4 Waste

4.4.1 Production Operations

During 2015, waste was generated during production operations at 19 of our offshore southern North Sea assets. Figure 4.11 presents the fate of each waste category for offshore production operations. None of the waste generated from the production operations was reused.

Figure 4.11: Fate of Each Waste Category for Production Operations



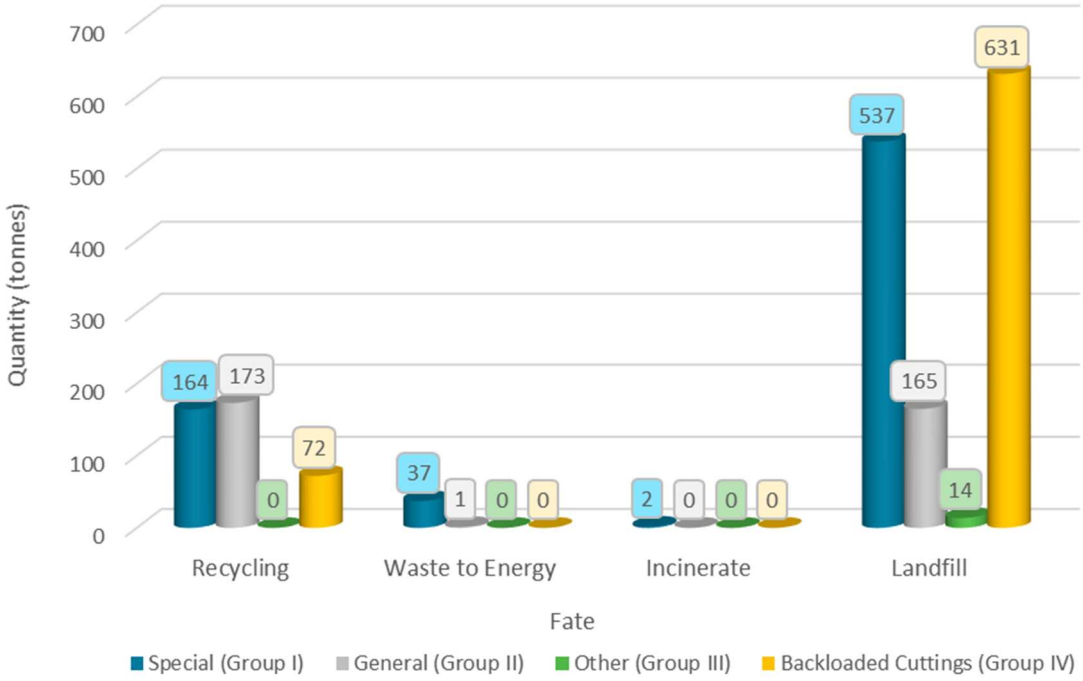
PUK assets generated a total of 2,151 tonnes of waste from offshore production operations in 2015. Approximately 84 percent was recycled or otherwise managed, rather than consigned to landfill. Only 7 tonnes of the 723 tonnes of special waste was sent to landfill.

4.4.2 Drilling and Other Operations

During 2015 drilling campaign the GSF Monarch jack-up drilling rig was used to drill the Hoton 2 well (48/07b-E). In addition, the Seafox 1 jack-up accommodation barge was contracted to undertake maintenance programmes on Hoton, Inde and West Sole Alpha installations.

Figure 4.12 presents the fate of each waste group for drilling and other operations during 2015. None of the waste generated from the production operations was reused.

Figure 4.12: Fate of Each Waste Group for Drilling and other Operations



A total of 1,796 tonnes of waste was generated from drilling and other operations during 2015. Approximately 23 percent was recycled or otherwise managed, rather than consigned to landfill. Approximately 537 tonnes of special waste was sent to landfill.

4.5 Hydrocarbon and Chemical Spills to Sea

The Oil Pollution Prevention 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 25 events were reported during 2015.

Brief details of the hydrocarbon and chemical spill events are provided in Table 4.2.

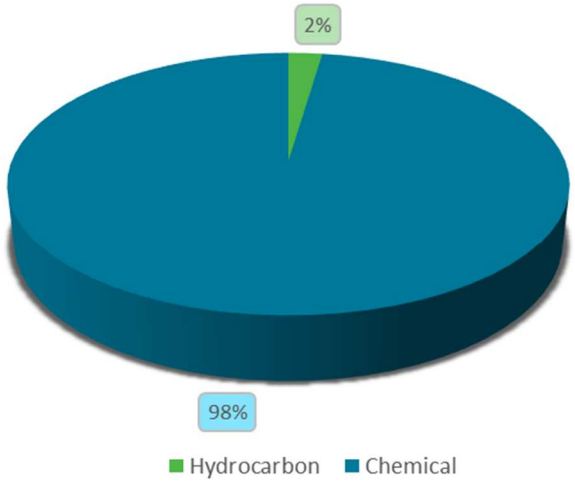
Table 4.2: Hydrocarbon and Chemical Spills to Sea

Location	Date	Description	Loss	
			Hydrocarbon (kg)	Chemical (kg)
Cleeton	11 Mar	Small loss of lube from turbines, pumps etc. due to seal failure	1.72	-
	16 Apr	Loss of methanol from small bore fittings associated with chemical injection equipment	-	20
	04 Oct	Loss of hydraulic fluid from hydraulic control line isolation valve	-	1
	11 Oct	Loss of oily waste from waste oil tote tank due to over filling	10	-
	25 Nov	Small loss of diesel from diesel systems due to equipment failure	0.1	-
	03 Dec	Loss of methanol from bunkering hose due to small split in hose	-	10
Excalibur	17 Jul	Loss of hydraulic oil from small bore fittings associated with the hydraulic manifold / control panel	30	-
Galahad	08 Aug	Loss of hydraulic oil from diesel systems due to pin-hole leak	150	-
Hoton	02 Jul	Loss of hydraulic fluid from small bore fittings associated with the hydraulic manifold / control panel	-	625
	11 Aug	Loss of hydraulic fluid from drains	-	146
Inde	21 Oct	Loss of lube during manual operation	20	-
Lancelot	12 Jun	Small loss of Monoethylene Glycol from small bore fittings associated with chemical injection equipment	-	0.01
	12 Jun	Small loss of hydraulic oil from small bore fittings associated with hydraulic manifold / control panel	1	-
Leman	15 May	Small loss of a foamer chemical from a transfer hose (not during bunkering) due to a pin-hole leak	-	1
	10 Jun	Loss of Monoethylene Glycol from pipework joint	-	6,785
	10 Jun	Loss of corrosion inhibitor from pipework joint	-	6

Location	Date	Description	Loss	
			Hydrocarbon (kg)	Chemical (kg)
	26 Jun	Small loss of diesel from the diesel systems due to pin-hole leak	0.5	-
	01 Jul	Small loss of hydraulic oil from crane hydraulic system	2	-
Minerva	15 Mar	Loss of hydraulic fluid from hydraulic manifold / control panel due to valve failure	-	600
	25 Aug	Loss of hydraulic fluid due to bursting disc / pressure safety valve (PSV) failure	-	100
Newsham	02 Jun	Loss of corrosion inhibitor from subsea chemical systems due to failure of the subsea control module (SCM)	-	1,257
Ravenspurn North	20 Dec	Loss of base oil completion fluid from instrument connection due to failure	10	-
Thames	25 Apr	Small loss of hydraulic oil from small bore fittings associated with the hydraulic manifold / control panel	0.45	-
West Sole	31 Jan	Loss of hydraulic fluid from fittings / connections associated with the hydraulics (open) system	-	19
	12 Feb	Small loss of hydraulic oil from crane hydraulic system	1	-
		TOTAL	**226.77**	**9,570.01**

Figure 4.13 presents the percentage of each substance spilt during 2015.

Figure 4.13: Overview of Substances Spilt (as a Percentage of the Total Amount Spilt)



During 2015, the majority (98 percent) of all substances spilt were chemicals.