

Annual Environmental Report



ORANJE-NASSAU
ENERGIE

2017





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ORANJE-NASSAU
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1 Welcome from the COO



Peter Nieuwenhuijze

Chief Operating Officer - Oranje Nassau Energie BV.

During 2017 activities Oranje-Nassau Energie (ONE) has maintained a strong focus on the North Sea as its core area of operations.

Through our excellent subsurface, operational and commercial capabilities, we have been ideally positioned to capture growth opportunities and create both short and long-term value for our stakeholders.

Last year achieved the successful acquisition of Sterling Resources Ltd holding a working interest in the INEOS operated Breagh gas field in the Southern North Sea. This includes a portfolio of various other exploration licenses in the UK and NL and it is an excellent example of our ability to execute our strategy with success. Even in the challenging economic climate last year, ONE was one of few operators who continued to complete a full drilling campaign in the North Sea, including two wells in the Dutch North Sea and two wells in the UK Southern North Sea.

“For existing production assets, ONE continues to seek innovative ideas to extend asset lifetimes and improve our operational excellence”

A good example is the Sean field life, looking to assure installation integrity for an additional number of years. An onshore project is the Dutch Q16Maas asset where we commenced

a study to use geothermal technology from an existing and future well. During this period the Environmental Management System has continually been improved and transitioned to ISO14001:2015 to support the growth of the company in the future and to ensure that we meet all our stakeholder expectations, legal requirements and our own objectives. On the Sean asset some major activities have included upgrading the gas turbine drivers for the gas compressor. To increase efficiency, increase the machine performance and reduce fuel gas consumption and associated NOx and CO2 emissions the turbine drivers of the power generators have also been refurbished. In addition the installation of the standby boat mooring buoys and Romeo NNMI projects were completed with the objective of reducing costs, but also the emissions associated with transport within a wider life cycle approach.

ONE will continue to actively look for development and exploration opportunities to support our long-term growth aspiration, preferably ONE-operated assets, both within and outside of our existing portfolio. The Ruby discovery in the Dutch North Sea bordering Germany is evidence that there are still underexplored areas in the North Sea.

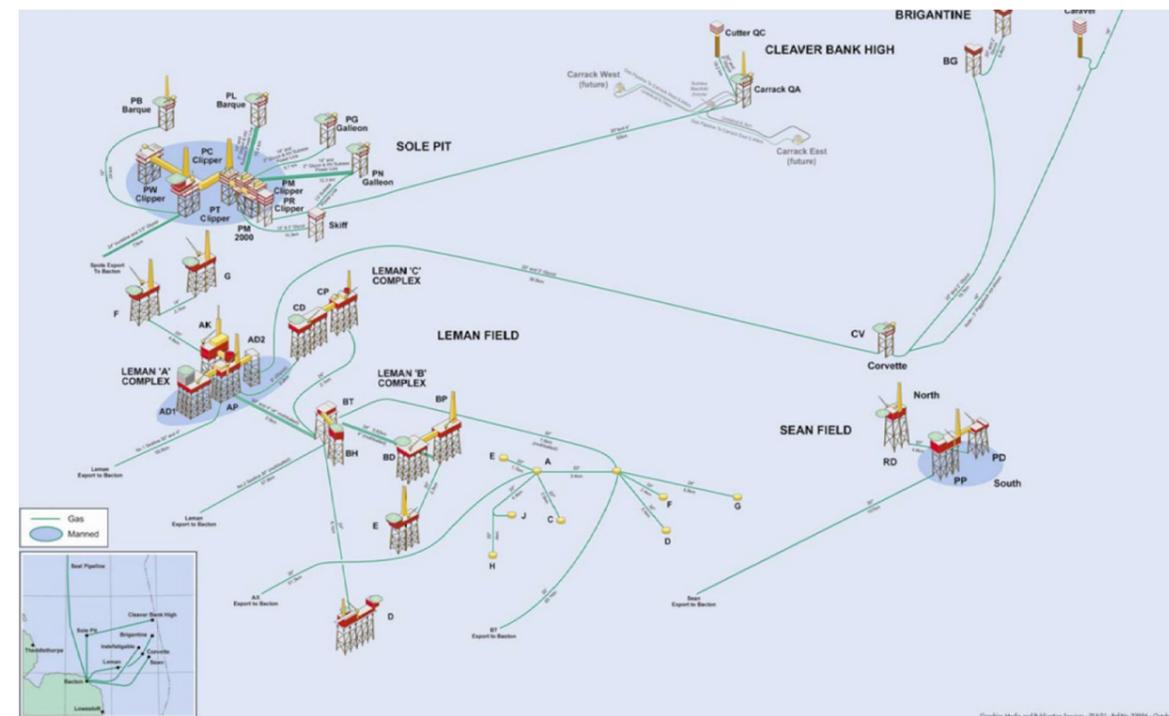
Peter Nieuwenhuijze

2 Introduction

The Annual Environmental Performance Statement for ONE UK aims to provide stakeholders and the public with an overview of the ONE operated installation facilities, offshore operations and environmental performance for 2017. For ONE UK as an operator of seaward licenses, the Annual Environmental Report (AER) and Environmental Management System (EMS) must meet the requirements of OSPAR recommendation 2003/5.

This report aims to:

- Describe our main UK assets and activities
- Provide an overview of ONE environmental management
- Give an overview of the main 2017 activities
- Provide details on key environmental aspects
- Summarise the ONE 2017 environmental performance in relation to relevant legislative requirements and environmental objectives and targets



**Figure 1:
Location of Sean assets**

3 Scope of ONE Activities

Oranje-Nassau Energie has a balanced portfolio in terms of oil and gas production, geographic spread through assets in the UK and Dutch North Sea and a spread of operated and non-operated stakes, operated by a variety of established operators.

In the UK, ONE has a non-operated share of the Buzzard and Gead assets (operated by Nexen). In 2017, ONE acquired Sterling Resources (UK) Limited which included a 30% working interest in the Breagh gas field (with INEOS) and a 2% share in the Cladhan production (with Taqa). ONE continues to hold the operated share of the Sean Papa and Romeo assets of 50% in partnership with SSE. This AER provides an overview of the emissions caused by drilling and production activities.

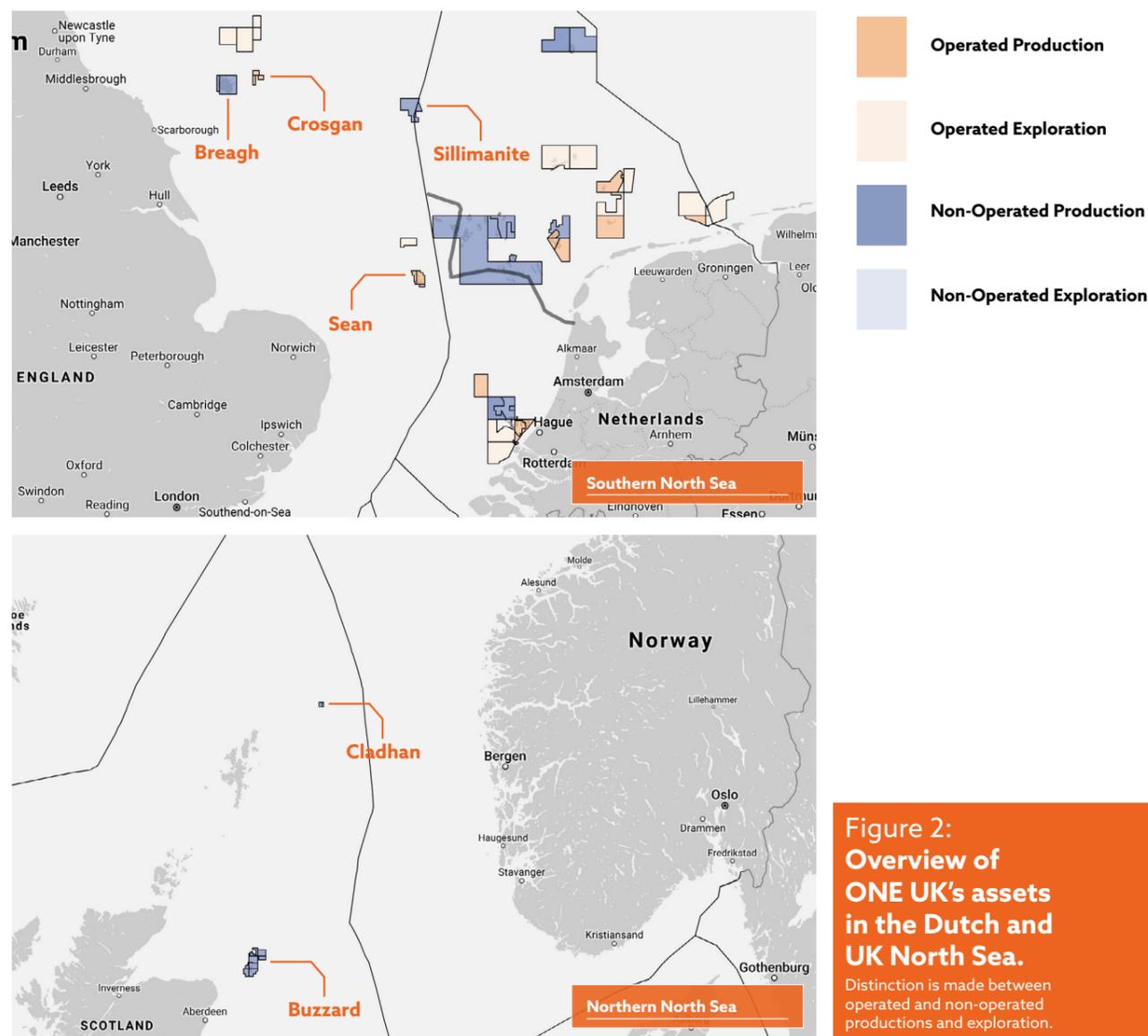


Figure 2:
Overview of ONE UK's assets in the Dutch and UK North Sea.
 Distinction is made between operated and non-operated productions and exploration.

3 Scope of ONE Activities (continued)

The **Sean Papa (PP & PD)** installation is located in the Southern part of the UK sector of the North Sea in block 49/25a at approximately 94km from the nearest point on the Norfolk coast. It is a Normally Manned Installation (NMI) comprising of two fixed bridge linked platforms; a wellhead platform (PD) and a production and accommodation platform (PP). Gas from Sean Papa is exported to the Bacton terminal in Norfolk via a dedicated pipeline.

The **Sean Romeo (RD)** is approximately located 4.5km off the Sean PP & PD in block 49/25a and is connected with the Sean PP & PD through a 20" duplex pipeline. The installation stands in approximately 30m of water and is situated 94km from the Norfolk coast. Following a successful barge campaign in 2017, the Sean Romeo was converted from a Normally Unmanned Installation (NUI) to a Not Normally Manned Installation (NNMI).

During the 2017 reporting period, there were a number of engineering and drilling activities completed in the UK.



3.1 Romeo Barge Campaign

In May 2017, the Seajacks Zaratan, a mobile jack-up support vessel provided accommodation, lifting, storage and workshop facilities during the Romeo modification campaign. The campaign lasted two weeks and conducted repairs to the platform and the removal of redundant equipment as well as replacement of the living quarters and upgrade of navigation aids.

3.2 Drilling Activities

During 2017, ONE drilled two wells in blocks 49/25 a and b using the Paragon Prospector 1 from July to November. The P11 "Q" well was drilled in a standalone location and the P10 "infill" well was drilled from the Sean Papa PD platform.



4 ONE Environmental Management

The ONE Environmental Management System (EMS) comprises of strategic corporate documents originating from ONE B.V. cascading down to ONE UK and Sean specific documents and procedures. In December 2017, both the UK and the Dutch management system was successfully certified to the new ISO14001:2015 standard.

The purpose of the EMS is to provide ONE with a framework to protect the environment and respond to changing environmental conditions in balance with socio-economic needs. It specifies the systematic approach that enables ONE to operate and develop oil and gas production assets in compliance with all relevant legal and stakeholder requirements. The corporate ONE HSE Policy sets out the company's commitments and forms the basis to develop, implement and monitor our environmental objectives and manage activities that can interact with the environment.

The ONE UK Environmental Management System is structured in line with the requirements of the international standard for environmental management and was first certified to the ISO 14001 in January 2016. The ONE UK EMS has been annually reviewed and was transitioned to ISO1400:2015 in November 2017. The EMS consists of the elements described in figure 3:



Figure 3:
Structure of ONE UK's
Environmental
Management System.

5 Health, Safety and Environmental Policy

The corporate Oranje Nassau Energie HSE policy covers all ONE activities in the UK and The Netherlands and reflects the commitment of the owners and the management team to develop and operate oil and gas production in a sustainable way. Protecting the health and safety of all persons involved, preventing pollution and minimising impact on the environment are the primary objectives of the policy. ONE believe that responsible and pro-active management is a key factor for ensuring business success.

The HSE policy is shown below:

Health, Safety & Environmental (HSE) Policy



ORANJE-NASSAU
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1. **Commitment**
 - Oranje-Nassau Energie B.V. and Oranje-Nassau Energie Resources Limited (hereafter are both companies referred to as "ONE") are committed to conduct their operations in a sustainable way that protects the health, safety and well-being of employees, contractors and the public. ONE will make every effort to prevent pollution and protect the environment, loss of integrity of assets and damage to the property of the company and third parties, with emphasis on prevention of major incidents. A responsible and pro-active HSE management is considered a key factor in ensuring business success.
2. **Policies**
 - We will comply with the intent and specific requirements of ONE compliance obligations covering all applicable laws, regulations and agreements with the government and business partners.
 - It is the responsibility of every individual who works for ONE to comply with these obligations as well as ONE policies and practices. This is a condition of employment.
3. **Objectives and Planning**
 - For the implementation of our policy we will maintain an HSE Management System including energy efficiency improvement, according to applicable national legislation and company standards.
 - We will set measurable targets as part of our annual HSE program.
4. **Implementation**
 - We will maintain HSE management standards, sound procedures and clear programs.
 - We will carry out risk assessments so that the business will be conducted with due care to safety, health and environment.
 - ONE will ensure that all employees and contractors are aware that the HSE aspects of their tasks and responsibilities are an integral part of the business.
 - If the safe or environmentally responsible completion of a task is not clearly foreseeable, the task shall not be started.
 - Employees and contractors are expected to take action on any substandard condition and to report any incident that resulted in or could have resulted in injury or damage.
 - Incidents will be investigated, the root causes determined and the results shared within the organization in order to prevent recurrence.
 - We will maintain effective emergency response procedures, train employees in their use and conduct emergency exercises.
5. **Monitoring and Audits**
 - We regularly conduct inspections and audits to monitor the compliance with and effectiveness of our HSE Management System.
 - We will share those results with employees, contractors and stakeholders involved, in order to identify strengths as well as opportunities for improvement.
6. **Management Review**
 - Management will annually review the HSE policy and the effectiveness of the HSE Management System.
 - The policy and management system will be adjusted as required.
7. **Continual Improvement**
 - We seek continual improvement to our health, safety, environmental and energy performance by yearly setting new (individual and company) targets.
 - We will actively co-operate with industry and authorities to further enhance our HSE standards and performance.

Alexander Berger
CEO



Figure 4:
Health & Safety
Policy

6 Environmental Aspects

As part of the process of establishing, implementing and maintaining the EMS, ONE has identified the significant environmental aspects of its onshore and offshore production and drilling activities and the environmental performance associated with these has been reported.

6.1 Spills to Sea

Non permitted releases of oil or chemicals to the sea must be reported using a Petroleum Operations Notice 1 (PON1) which is submitted to the Department of Business, Energy and Industrial Strategy (BEIS) on an electronic portal. This notice provides details of the spill and actions taken to prevent a recurrence. ONE reports and investigates all spills to sea and tracks and manages the actions on the Synergi system.

6.2 Oil in water

Produced water from wells associated with gas production is regulated under The Offshore Petroleum Activities (Oil Pollution Prevention and Control) regulations 2005 (as amended). ONE has a permit to re-inject produced water to the A-2002 well on the Sean PD installation. Volumes of water and concentrations of oil are monitored and reported to BEIS on the Environmental and Emissions Monitoring System (EEMS).

6.3 Offshore Chemical

ONE holds a chemical permit for chemicals associated with oil and gas production activities on the Papa and Romeo. This is regulated under the Offshore Chemicals (Amendment) Regulations 2011. The annual use and discharge of these chemicals for production operations and drilling activities is reported to BEIS via EEMS.

6.4 Waste

ONE manages waste segregation on the installations to help minimize the quantity of waste shipped and disposed of to landfill, and to identify reuse and cost saving opportunities.

6.5 Atmospheric Emissions

Sean Papa emissions are highly regulated and reported under several pieces of associated legislation. This includes venting, Carbon Dioxide (under European Union-Emissions Trading Scheme legislation) and other combustion gases including Nitrous Oxides, Sulphur Dioxide, Carbon Monoxide, Methane and Volatile Organic Compounds. In addition, refrigeration gases are regulated, monitored and reported annually. Drilling activities require the reporting of diesel use for the Non-Production Installation (NPI) and flaring during well clean up and testing activities.



7 Environmental Objectives and Targets

Extent to which ONE UK's 2017 Environmental Objectives and targets have been met.

2017 Environmental Objectives	Achievement
Reduce quantity of oil spilled to sea	✓ Quantity reduced from 3.85 tonnes in 2016 to 0.298 tonnes in 2017
Ensure staff have appropriate environmental training and awareness	✓ In 2016, 65% of control room operators had received environmental legal permit training. At the end of 2017, this percentage stood at 92%
Increase combustion fuel efficiency	✓ Engineering program to increase Ruston efficiency was completed in 2017 for all three turbines. Fuel use was decreased by 25% of daily use on fuel gas
Reduce emissions from transport	<p>✓ The mooring buoy was installed in April 2017 to reduce miles sailed and fuel used (and associated maintenance costs) by the ERRV</p> <p>✓ The Romeo platform was modified from a NUI to NNMI to allow overnight stays and reduce helicopter flights</p> <p>✓ Reduce helicopter flights from 168 to 18 planned flights per year</p>
Improve communications in HSE	✓ Regular monthly HSE meetings were completed involving both UK and Dutch Assets.
Transition to new ISO14001:2015 standard	✓ The UK and Dutch Environmental Management Systems were certified to the ISO14001:2015 standard in December 2017

8 Spills to Sea

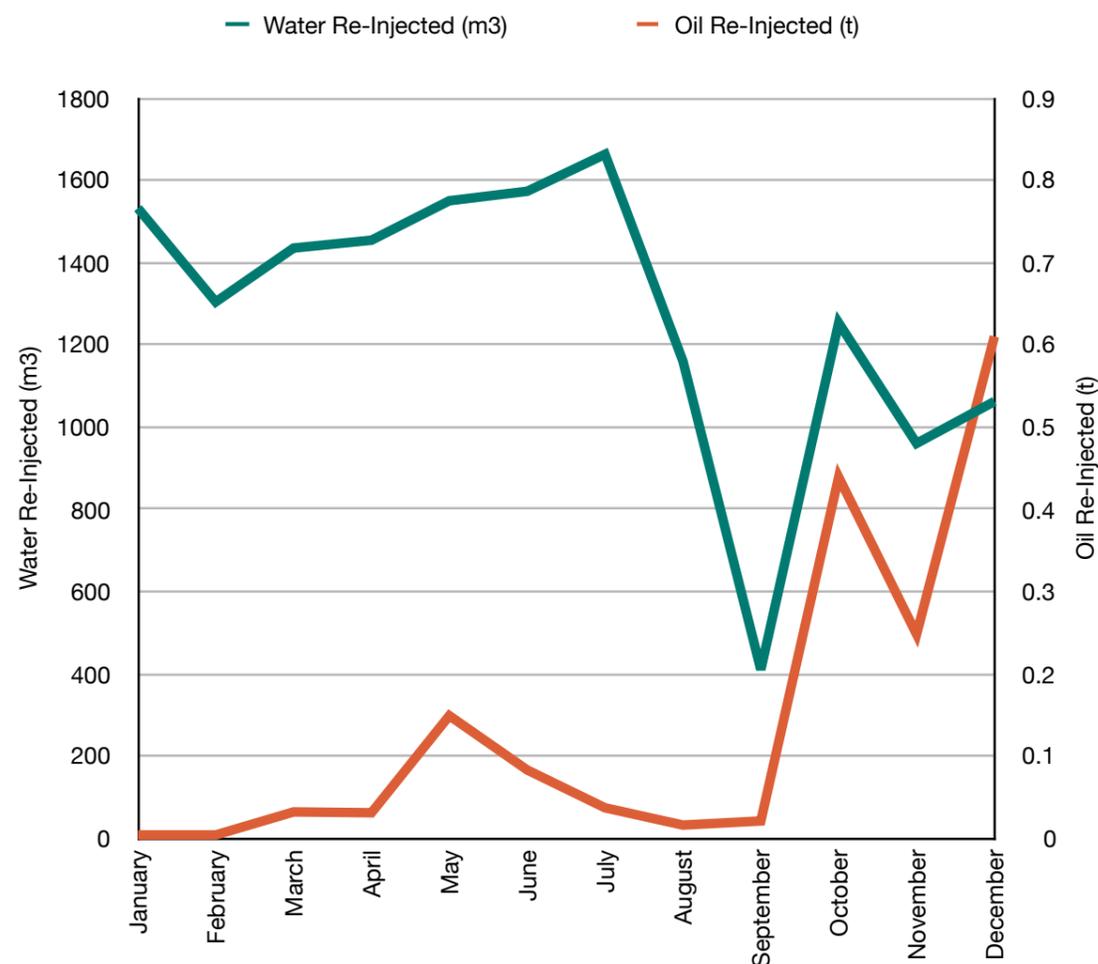
Three spills to sea occurred during 2017 from the Sean platforms for which a PON 1 was issued to BEIS. The number of incidents increased, two incidents in 2016 to three in 2017, but the quantity of oil and chemicals spill has decreased. These were all investigated with a Root Cause Analysis performed to identify the immediate and system causes. Actions have been instigated and tracked on the Synergi system. The incidents are described in the table below.

There were no PON1 reports associated with the UK drilling activities.

Date	Type	Quantity	Description
17/02/2017	Oceanic subsea hydraulic fluid	292kg to end of 2017	This leak is from a subsea hydraulic connection to the Bacton export pipeline SSIV. The investigation is ongoing to establish whether the fluid is definitively being lost to sea. Due to the very low leak rate and subsea location, identification and remediation is challenging.
03/05/2017	Hydraulic oil	0.5kg	Small quantity of oil was lost from the G1061 turbine automatic combustion chamber drain system. This is a safety design to prevent buildup of flammable material.
18/08/2017	Tellus T15 oil	5kg	This originated from a leak from a fitting on the hydraulic control line from the wellhead valve (2005 flow wing valve) through normal operational wear. The pipework and fitting was replaced.

9 Oil in Water

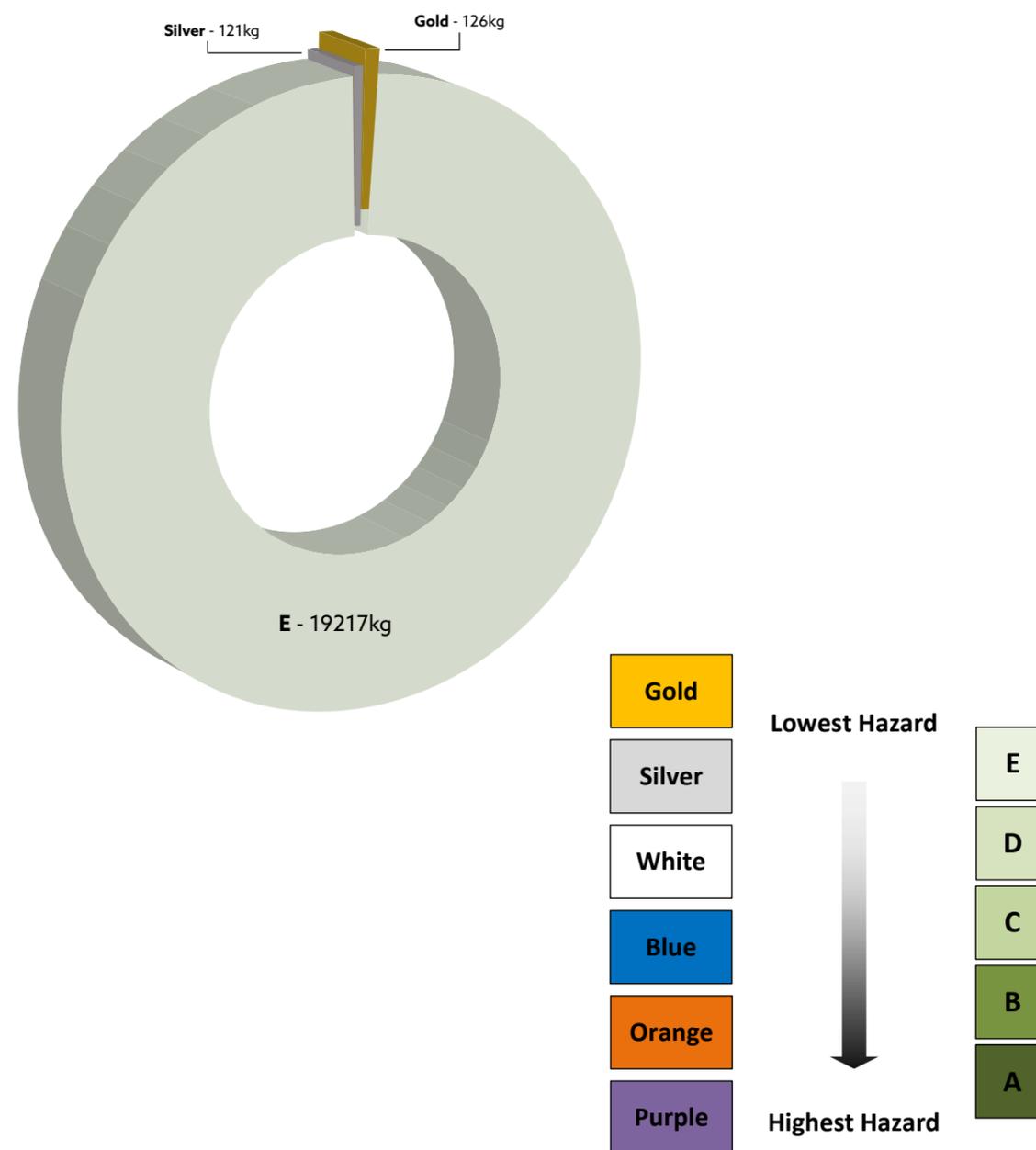
All produced water originating from the Sean Papa and Romeo wells is treated and re-injected. There are no re-injection limits applied to the oil in water content for re-injection. No water was discharged during 2017, volumes of water and oil re-injected during 2017 (as reported monthly on EEMS) are shown in the chart.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Re-Injected (m3)	1532	1304	1435	1454	1550	1573	1663	1160	410	1253	960	1062
Oil Re-Injected (t)	0.004	0.004	0.032	0.031	0.149	0.083	0.037	0.016	0.021	0.439	0.248	0.61

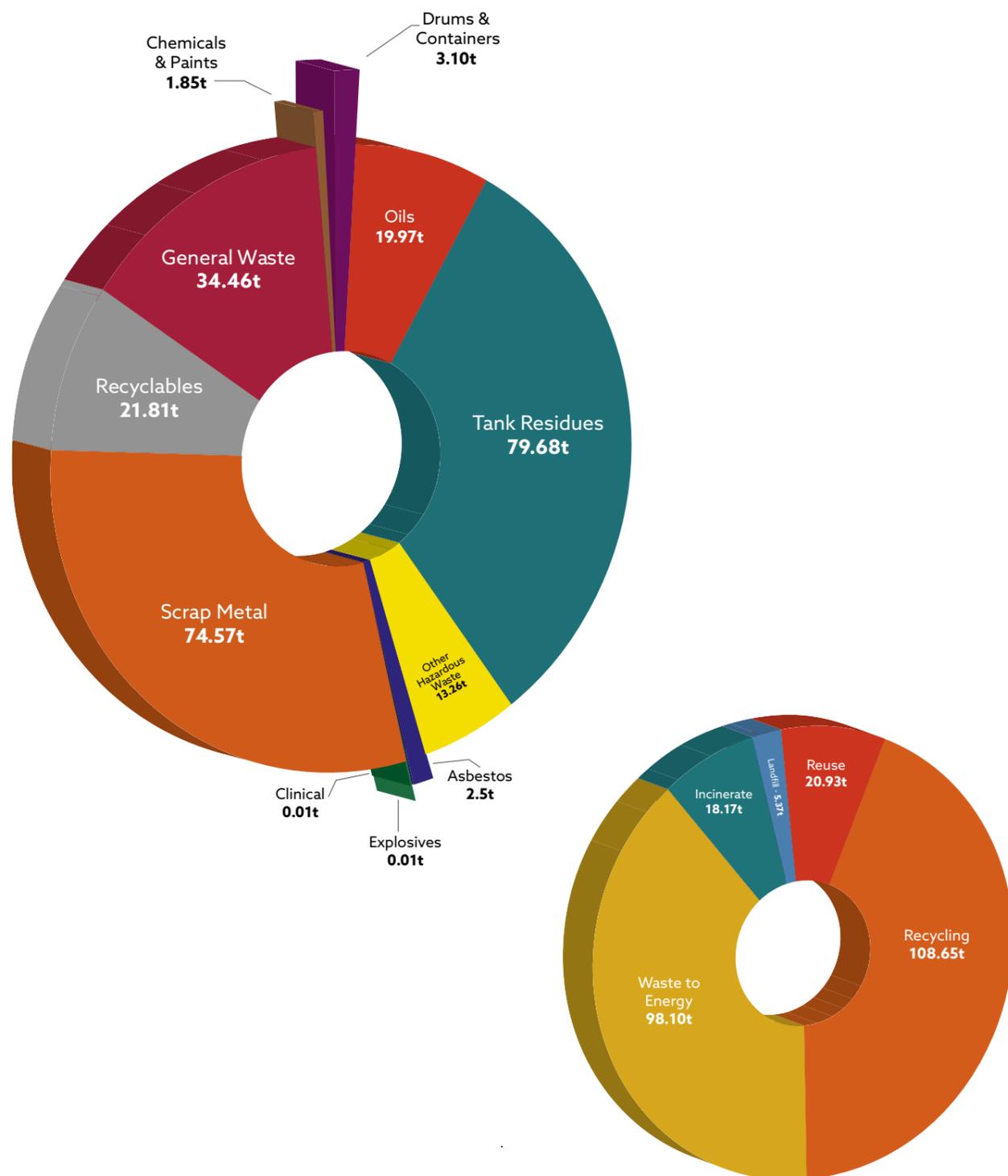
10 Production Chemicals

Total use and discharge of chemicals (as reported in EEMS for 2017) is reported according to the label and ranking categories in the chart below. The largest use of chemical was for Triethylene Glycol (TEG), this is used as a gas hydrate inhibitor. This is not discharged however, but is collected and shipped to shore for recycling. The remaining chemical use was for offshore cleaning and for topping up hydraulic systems.



11 Production Waste

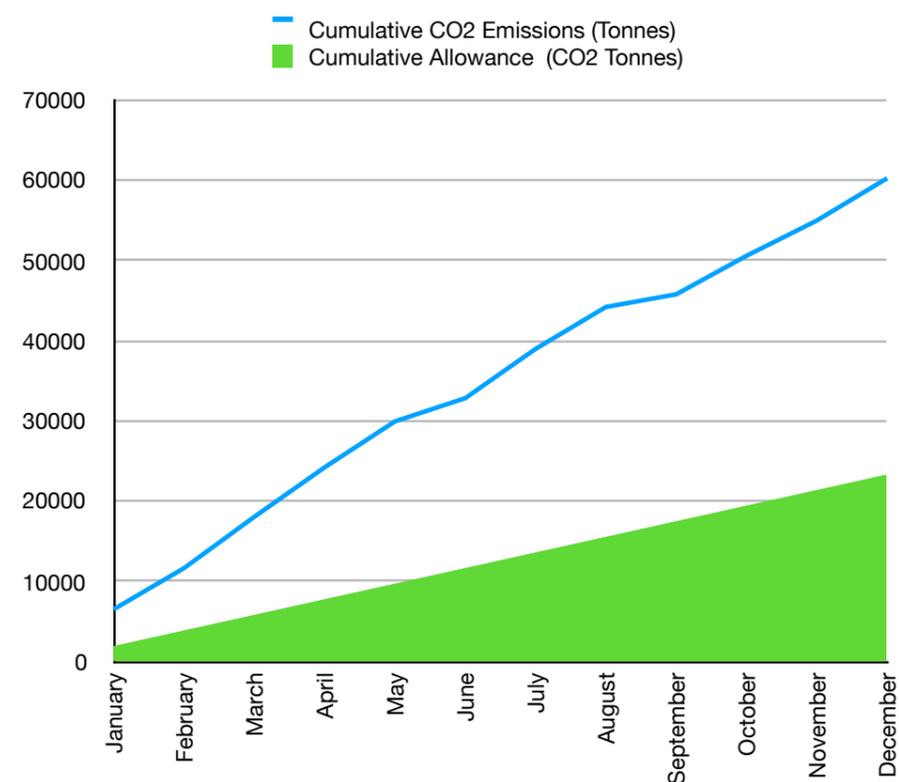
ONE shipped a total 251 tonnes of waste in 2017 from the Sean Papa and Sean Romeo platforms, this was then shipped to Den Helder in the Netherlands for treatment. Tonnes of waste has been charted according to type and disposal route. The largest types recorded were tank residues and scrap metals associated with the removal of redundant equipment.



12 Production Atmospheric Emissions

12.1 Carbon Dioxide

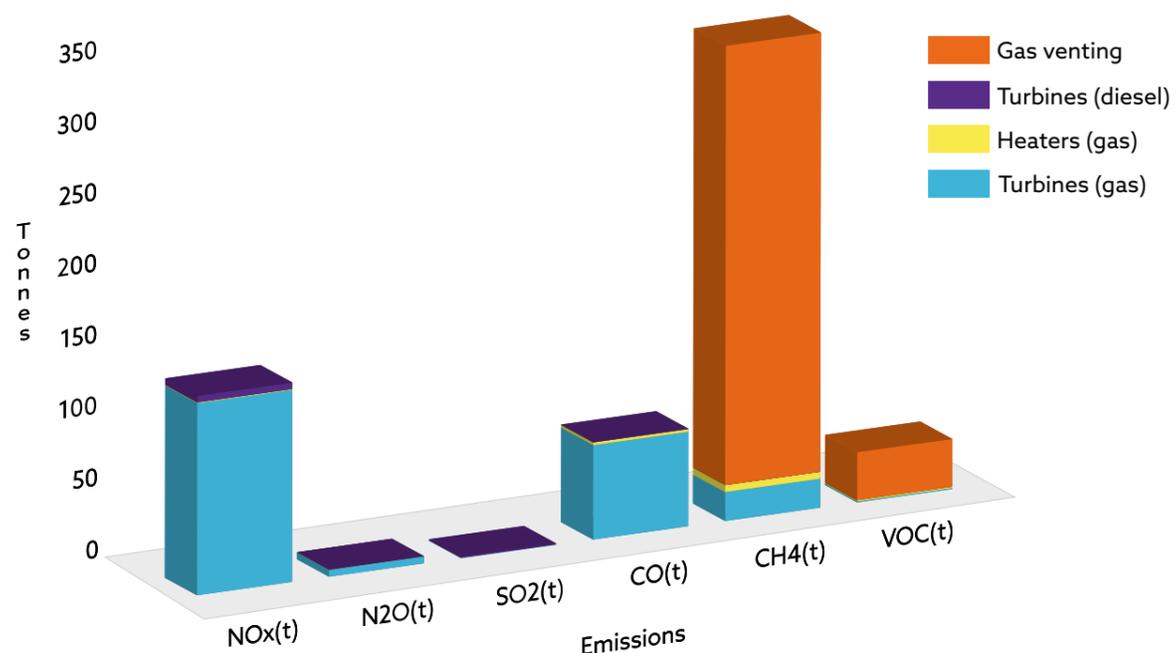
Carbon Dioxide emissions are highly monitored and reported for EU-ETS purposes. On the Sean Papa, 60,000 tonnes of Carbon Dioxide was emitted from fuel gas and diesel use in 2017. The monthly accumulated Carbon Dioxide emissions from all combustion equipment on the platform are presented in the chart. The emissions monitored are compared against the free allocations received for the platforms.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cumulative CO2 Emissions (Tonnes)	6253	11657	18055	24222	29952	32844	38987	44213	45791	50593	54993	60261
Cumulative Allowance (CO2 Tonnes)	1943	3887	5830	7774	9717	11661	13604	15547	17491	19434	21378	23321

12.2 Other Emissions from Combustion and Venting

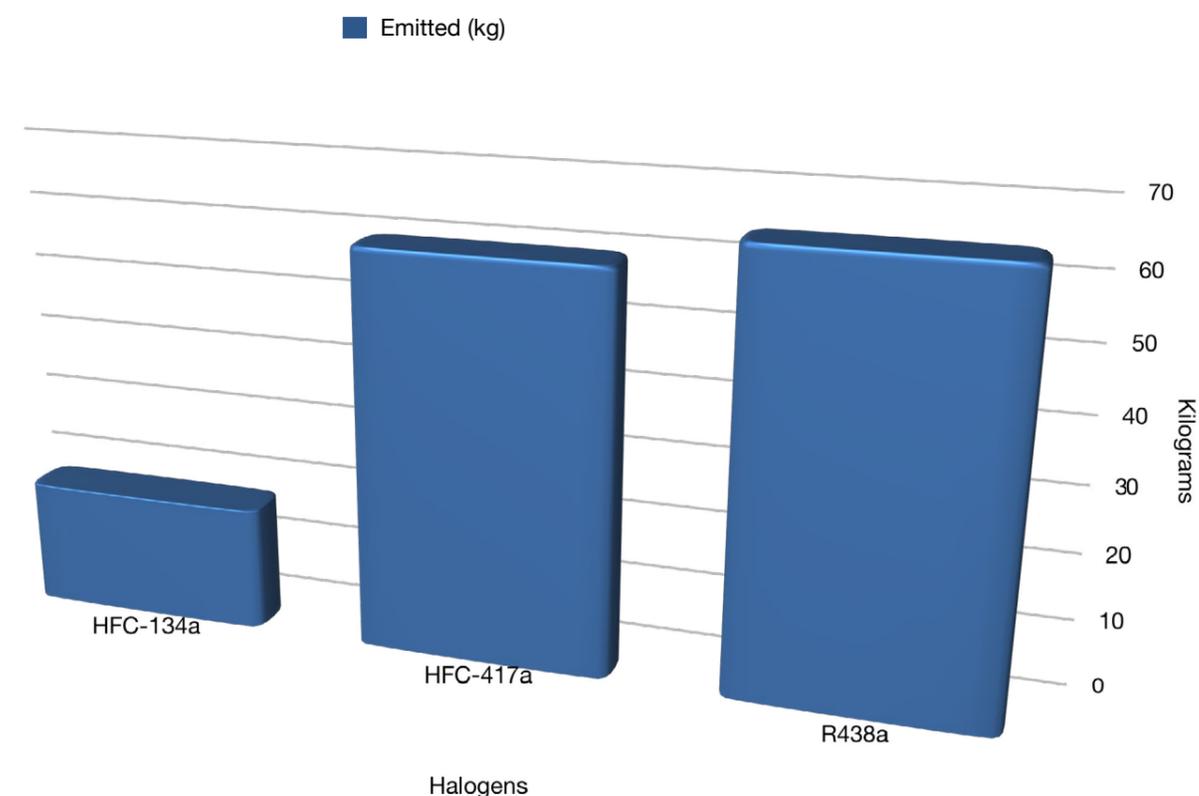
Emissions reported on EEMS under the Offshore Combustion Installations (Pollution Prevention and Control) Regulations 2013 (Permit number PPC/4/0) are displayed in the chart. These are broken down into emissions from turbines and heaters fueled on gas and turbines fueled by diesel. The largest proportion of emissions are for Nitrous Oxides (NOx) emitted from the combustion of fuel gas. Emissions vented under the Energy Act 1976 (Petroleum Production Licence No(s). P7 and P54) are displayed, which show the highest contribution from Methane (CH4) emissions.



	Turbines - Gas	Heaters - Gas	Turbines - Diesel	Venting
NOx	140.61 tonnes	0.62 tonnes	4.80 tonnes	0 tonnes
N2O	5.07 tonnes	0.06 tonnes	0.08 tonnes	0 tonnes
SO2	0.30 tonnes	0.00 tonnes	0.71 tonnes	0 tonnes
CO	69.15 tonnes	1.97 tonnes	0.33 tonnes	0 tonnes
CH4	21.21 tonnes	5.13 tonnes	0.01 tonnes	321.55 tonnes
VOC	0.83 tonnes	0.83 tonnes	0.11 tonnes	34.95 tonnes

12.3 Refrigeration Gases

A number of refrigeration gases are used in equipment on the Sean Papa platform. In 2017, 143.25kg of refrigeration gases were emitted, the majority of this was from the Compression HVAC system which is in the process of being upgraded.

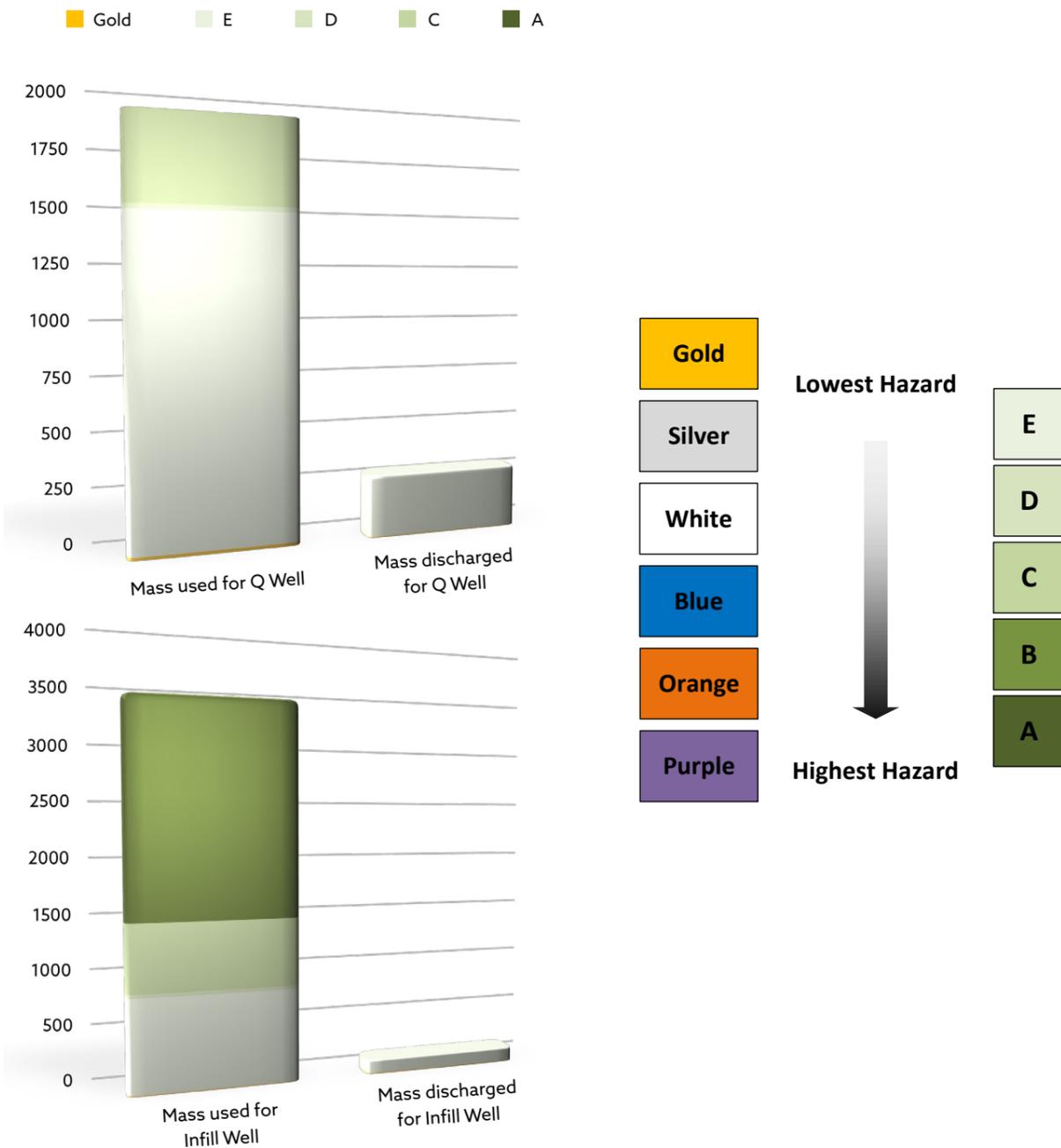


Compound	Emitted (kg)
HFC-134a	19
HFC-417a	60
R438a	64

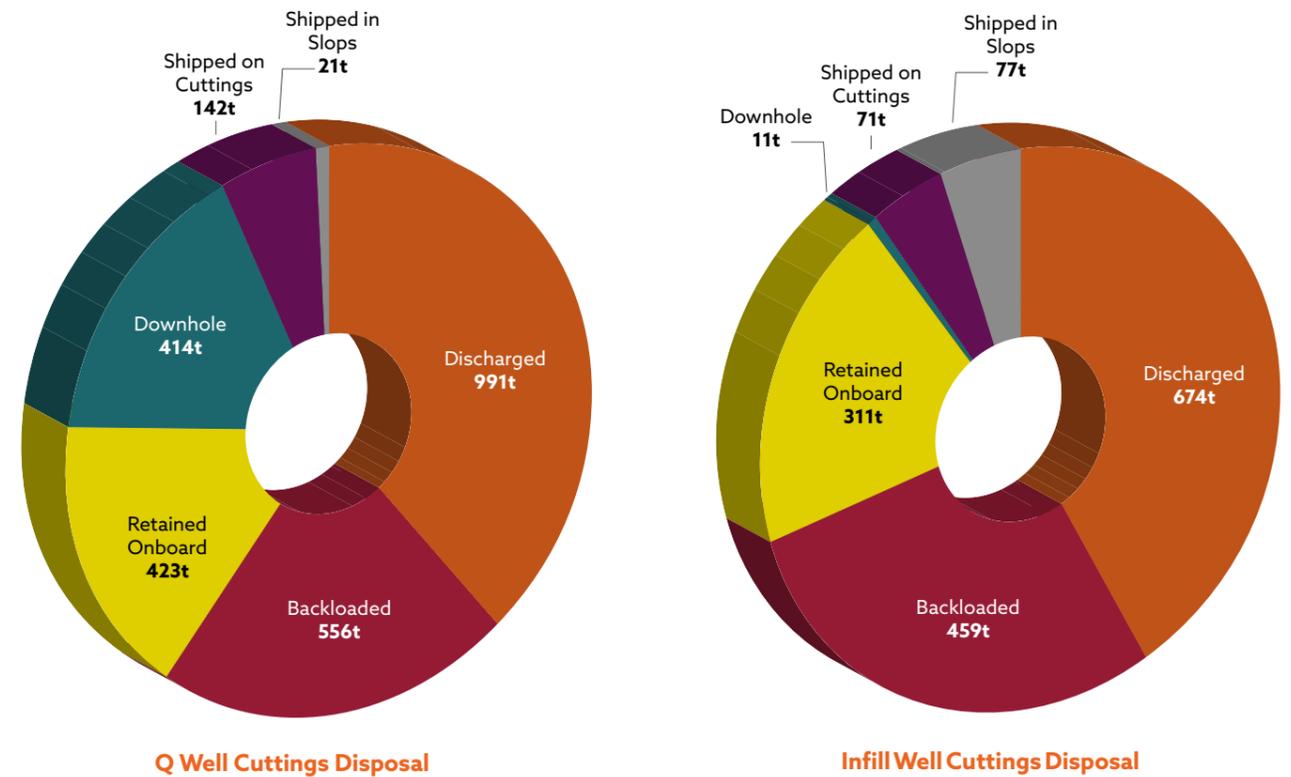
13 Environmental Reporting from Drilling Activities

13.1 Drilling Chemical Use

Chemical use and discharge for the "Q" and "infill" wells (as reported on EEMS under the drilling chemical permits) are displayed in the charts for each well. Low toxicity water-based drilling muds and cuttings used in the top sections and the cementing chemicals were discharged to the marine environment. The oil-based muds and cuttings were collected and shipped to shore for treatment and reuse.

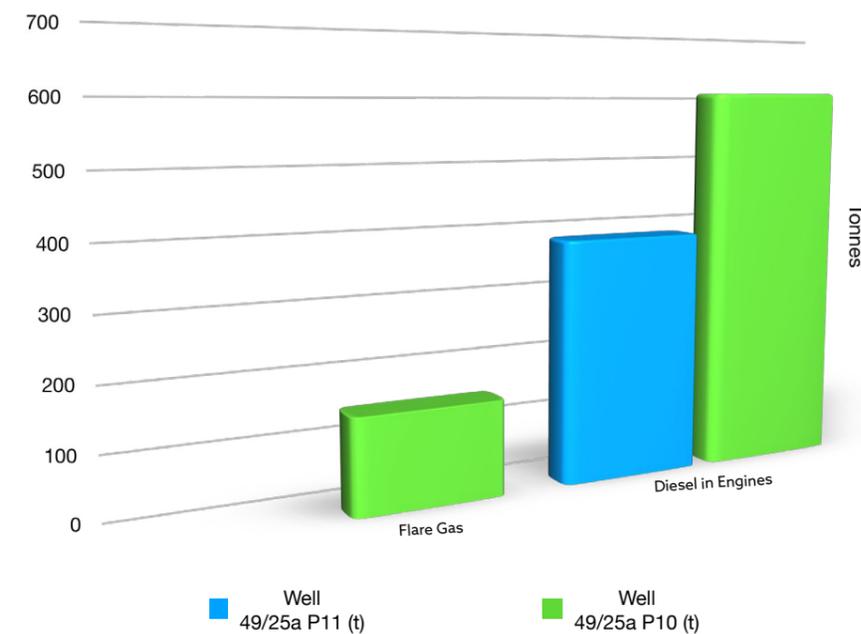


13.2 Drill Cuttings Disposal



13.3 Drilling Atmospheric Emissions

Air emissions associated with ONE drilling activities in 2017 are associated with the use of diesel for energy production on the Prospector 1 and emissions from flaring during the clean-up and testing of the infill well.



14 Environmental Objectives for 2018

ONE B.V. has developed the following environmental objectives for 2018:

- Identify energy savings opportunities for the Sean Field
- Reduce ONE use of plastics
- Improve knowledge of combustion emissions to identify reductions
- Reduce incidents associated with small bore tubing



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