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# Maersk Oil UK Environmental Performance Report 2016

"An ongoing commitment to legal compliance, continual improvement,  
and prevention of pollution in our UK operations"



**MAERSK**  
OIL



## Maersk Oil North Sea UK Limited Health, Safety & Environment (HSE) Policy



I am committed to an Incident-Free Maersk Oil

- For safe people
- For a better business

**BETTER. SAFER. TOGETHER**

**Morten Kelstrup**  
Managing Director,  
Maersk Oil North Sea UK Limited

### Our Incident-Free Commitment

At Maersk Oil UK we are committed to fulfilling our Incident-Free ambition to protect people, the environment, our assets and reputation.

### At Maersk Oil UK we shall:

- Demonstrate constant care through visible and active role-modelling that engages colleagues
- Manage HSE as a line responsibility with clear accountabilities
- Ensure that our employees and contractors have the right competencies, behaviours and resources to achieve sustainable Incident-Free operations
- Continuously improve the effectiveness of the HSE Management System through findings from risk-based auditing, incident investigation and published good practice
- Ensure compliance with company, legal and regulatory requirements as well as good industry practice
- Systematically identify, assess and manage major accidents and other HSE risks throughout exploration, design, construction, operation and abandonment of wells and facilities
- Sustain a learning organisation by reporting and investigating incidents, to ensure root causes are identified and acted upon
- Maintain effective emergency preparedness plans including regular exercises
- Proactively engage with stakeholders to understand their HSE interests
- Commit to continual improvement in environmental performance minimising and preventing pollution as far as is practicable
- Establish clear HSE objectives and targets and review these regularly

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# Managing Director's Introduction



I am pleased to introduce the 2016 Environmental Performance Report for Maersk Oil UK. The purpose of the report is to demonstrate how we work to address our environmental responsibility towards our offshore operations, and to outline our 2016 performance on key environmental indicators.

Maersk Oil has produced oil and gas in the UK North Sea since 2005, and one of our key objectives is to manage the environmental impact of our operations in a responsible manner.

A key part of our work to maximise production from our existing mature fields, develop marginal fields and projects, and find and produce new oil and gas deposits, is continuously focusing on improving our environmental impact.

In 2016 production from the UK North Sea went as planned, we Maersk Oil UK successfully maintained an ISO14001 certified Environmental Management System, and I am pleased that we can report an improvement on several of our key environmental indicators.

One area that is worth noting is reduction of the total oil quantities discharged to sea. Another is our chemical management, where we managed to reduce the number of chemicals with subwarnings from six in 2015 to four in 2016. During 2016 we ran a project on GPIII which managed to successfully replace all chemicals listed as candidates for substitution. In 2017 this project will be carried across our other installation, the Gryphon FPSO, and we will also focus on reducing the numbers of spills across our operations.

Additionally, environmental performance considerations are being designed into our future operations for our Culzean field – which is expected to meet 5% of UK gas demand by 2020/21.

We recognise there is always room for improvement and on our journey to Incident-Free operations, we will continue to focus on the reduction of environmental incidents and driving continual improvement of our overall environmental performance.

We welcome comments and questions on the content of this publication.

**Morten Kelstrup**  
Managing Director,  
Maersk Oil North Sea UK Limited

# Our Operations

Maersk Oil UK North Sea Ltd has been present in the UKCS since 2005. In 2016 the company operated nine fields: Gryphon, Tullich, Maclure, Donan (Dumbarton), Lochranza, Balloch, Janice, James and Affleck. In May production ceased and in September decommissioning commenced on three fields: Janice, James and Affleck.

Three operated North Sea assets located within the United Kingdom Continental Shelf (UKCS) with one being removed for decommissioning during September 2016.

- Janice Alpha FPU
- Gryphon Alpha FPSO
- Global Producer III FPSO

During the 2016 reporting period, Maersk Oil UK's activities included an active drilling programme involving drilling and well abandonment operations.

## Operated Production and Drilling Activity

### Total Operated Production (MMBOE)



### Wells Completed



### Wells Spudded








Leadon South field well abandonments completed, and batch drilling commenced at Culzean field well developments.



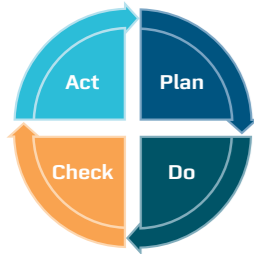
# 2016 Environmental Performance Summary

The mapping and monitoring of discharges, emissions and wastes arising from our drilling and production activities is a long established practice within Maersk Oil UK. This information is used for regulatory reporting purposes and helps inform our strategy to improve our environmental performance. Data relating to key Environmental Performance Indicators (EPIs) based on internal targets for 2016 is summarised below.

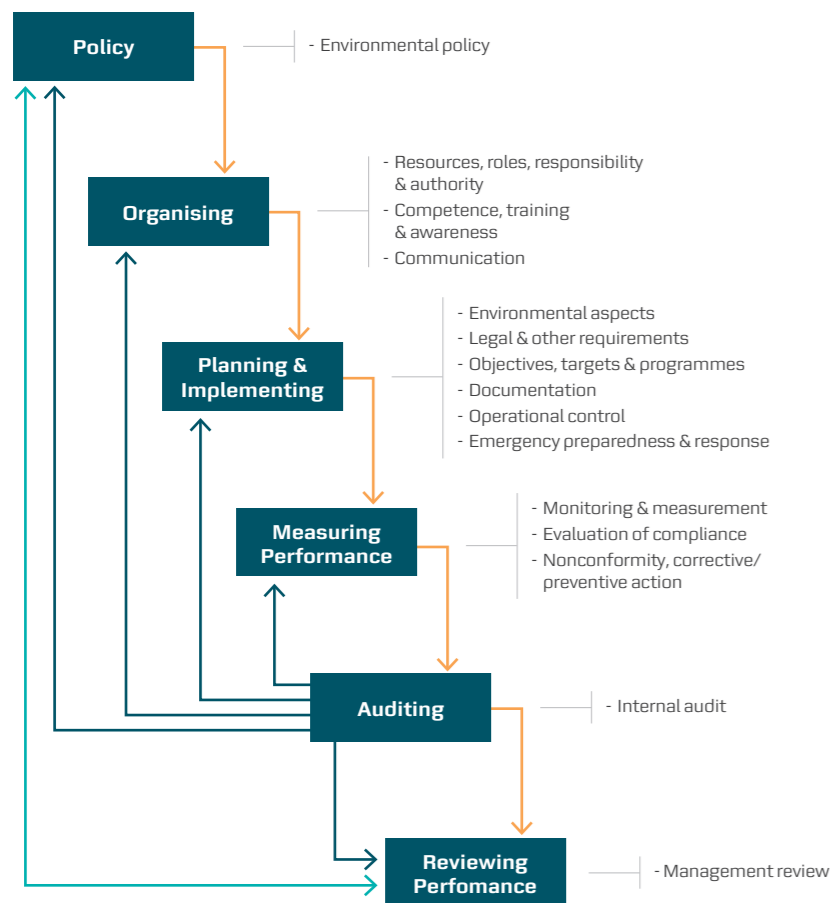
Issue	Maersk Oil UK 2016 Objectives	2016 Internal Targets	2016 Performance
 <b>Environmental Performance</b>	Increase environmental risk awareness to reduce environmental incidents	Zero spills	Production Operations 9 x PON1 Drilling 4 x PON1
	Systematically identify and manage environmental risks through a fully functioning EMS which aims to drive continual improvement	Maintenance of the certified EMS to ISO14001 across all locations and within scope	Certification maintained
	Deliver a robust (risk based) internal and third party (contractor) environmental auditing programme	100% audit completion against plan	100% completion against plan
 <b>Atmospheric Emissions</b>	Continue to improve understanding of atmospheric emissions management and where possible reduce GHG emissions in line with permit conditions and operational demands	< 185,122 tonnes CO <sub>2</sub> – Flaring	163,236 tonnes
		< 260,460 tonnes CO <sub>2</sub> derived from combustion activities	240,663 tonnes
 <b>Discharges to sea - produced water</b>	Continue to investigate, evaluate and prioritise measures to improve the management of oil in produced water and where possible reduce oil and chemical discharges in line with permit conditions and operational demands	< 80.80 tonnes oil to sea	Actual 59.62 tonnes
		< OiPW 28 mg/l	Actual 27.9 mg/l
 <b>Discharges to sea - chemical management</b>	Reduce the use and discharge of chemicals with SUB warnings	5 chemicals with SUB warnings by end of year	Actual 4
		Drilling – zero SUB chemicals discharged	Zero
 <b>Waste Management</b>	Promote waste management practices in line with the principles of the waste management hierarchy	> 55% recycling rate from offshore production facilities	50%
		>60% recycling rate related to drilling activities (excluding waste sent for onshore treatment)	59%

# Maersk Oil UK Environmental Management System

Within all our international operating units, Maersk Oil has established a clear framework for the effective management of HSSEQ issues involving exploration, drilling, production and decommissioning activities. Maersk Oil UK regards environmental management as being an integral part of our overall management responsibility, the fundamental aims being to support environmental protection, prevent pollution and comply with legislation and regulations.



## ISO 14001



The principles of the International Standard for Environmental Management Systems (ISO14001:2004) are incorporated within the Maersk Oil UK Global Management System (GMS).

The GMS provides the framework for a 'Plan-Do-Check-Act' approach to HSSEQ management, which actively promotes continual improvement in all aspects of the organisation's activities.

In 2010 Maersk Oil UK successfully secured certification of the Environmental Management System (EMS) to the International Standard ISO14001: 2004. The scope of certification for Maersk Oil UK is "Extraction and production of oil and natural gas on Maersk Oil operated UKCS Fields and onshore support activities, including planning and organisation of development and exploration for all UK operated blocks, carried out at Maersk House". Throughout 2016 we have maintained ISO14001 certification.

# 2016 Key Improvement Activities

As part of Maersk Oil UK's drive to meet our environmental objectives we have a three year rolling improvement programme. The plan is updated on an annual basis taking into account both what was achieved in the previous year and what we plan achieve in the coming year(s). A plan for achieving each environmental target is held within the environmental improvement programme and monitored monthly for progress against planned improvement activities Environmental Performance Indicators are used to evaluate performance against the plan.



## Environmental Performance Objectives

### Take all reasonable steps to prevent pollution

**Increase Environmental Risk Awareness** Through greater understanding of environmental risks, we aim to reduce environmental incidents and improve environmental performance through communication and awareness onshore and offshore. A key part of Maersk Oils workstream in 2016 was to increase environmental awareness offshore and promote environmental best practice during day to day operations. In 2016 we launched an Environmental E-Learning module which will be delivered to all new starts offshore on our contracted drilling rigs.

### Systematically identify and manage environmental risks through a fully functioning EMS

EMS Certification to ISO14001 was maintained across all locations and within scope. No Non Conformances were identified in the 2016 surveillance audit.

### Deliver a robust (risk based) internal and third party (contractor) environmental auditing programme

Recommendations and actions implemented following environmental audits minimise risks and promote continual improvement. 100% of environmental audits were completed in 2016 against the audit plan.



## Atmospheric Emissions Objectives

**Continue to investigate, evaluate and prioritise measures to improve energy efficiency and reduce emissions to air** Atmospheric emissions mainly arise from power generation and flaring associated with offshore hydrocarbon production activities. The main combustion emission from these sources is carbon dioxide (CO<sub>2</sub>), along with oxides of nitrogen, nitrous oxide, sulphur dioxide, carbon monoxide, methane and volatile organic compounds.

Maersk Oil ensures plant maintenance regimes are in place to maintain efficient energy combustion equipment. We also aim to minimise the use of diesel, which reduces CO<sub>2</sub> emissions to atmosphere when compared with using fuel gas.



## Discharges to Sea - Produced Water Objectives

**Continue to investigate, evaluate and prioritise measures to improve the management of oil in produced water and where possible reduce oil and chemical discharges** Oil-in-Produced-Water (OiPW) refers to the trace amounts of oil still remaining in the water phase following treatment. It is the produced water and reservoir management strategy on all Maersk Oil installations to re-inject produced water when re-injection capabilities are available with an aim to minimise the volume of oil discharged to sea.

During 2016, one of the great successes was the increased focus on water injection on GPIII, with a total of 83% being re-injected compared with 57% in 2015. This minimised the volumes of oil and chemicals discharged to sea.



## Discharges to Sea - Chemical Management Objectives

**Reduce the use and discharge of chemicals with SUB warnings** Chemicals are used for a wide variety of purposes in the offshore industry, e.g. to optimise production, aid separation and for protection against corrosion and bacterial growth.

Maersk Oil UK aims to reduce the use of products with selected harmful, components marked for substitution. Maersk Oil have actively pursued swap out of SUB chemicals over the past three years, and during 2016 the installation GPIII became a sub-free installation. Gryphon has gone from using 6 SUB chemicals in 2015 to 4 in 2016.



## Waste Management Objectives

### Promote waste management practices in line with the principles of the waste management hierarchy

Maersk Oil's aim is to minimise waste produced and reduce dependence on landfill; as such there are robust arrangements in place for the segregation and management of these wastes. Waste is disposed in line with the waste hierarchy. The percentage of waste recycled has decreased by 5% since 2015, this is in part due to large volumes of oil contaminated sand being sent for onshore disposal. We have a well intervention campaign planned for 2017 to repair sand screens in an attempt to reduce the quantities of sand being produced with the reservoir fluids.

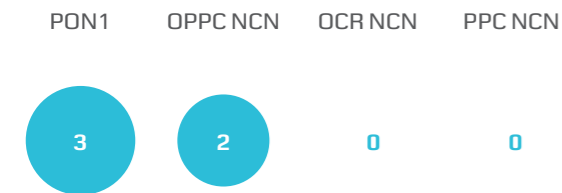
# Environmental Performance Summary

## Janice Alpha

- Floating Production Unit (FPU)
- Location: 156 miles south east of Aberdeen in Block 30/17a
- Currently produces from the Janice, James and Affleck fields



### Environmental Performance



### Three PON1s:

- Heavy rain washed oil deck residue to sea.
- Overflow of the forward diesel tank via the vent causing a spill to deck which resulted in a release of diesel to sea.
- Subsea hydraulic leak from the Affleck manifold.

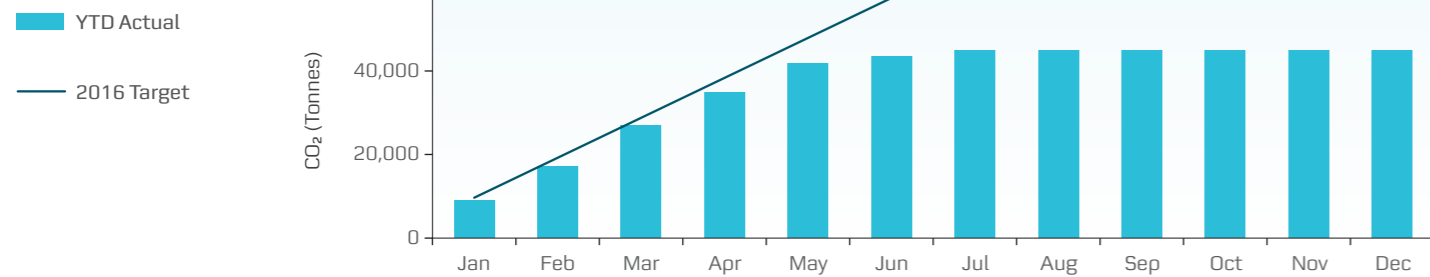
### Two OPPC NCNs:

- Discharge of oil in water at a concentration >100 mg/L. Produced water was being reinjected however a PWRI pump trip caused produced water to be diverted overboard.
- Monthly OPPC EEMS return management.

Janice OPPC compliance performance is a result of the Maersk Oil PW Management Strategy as described on page 8 discharges to sea – produced water. Although targets were exceeded for Oil in Water concentration, the percentage of produced water re-injected (PWRI) remained high, at 97 %, therefore reducing the quantity of oil discharged to sea. The MOUK produced water management strategy is to maintain PWRI capabilities in order to minimise oil and chemical discharge to sea.

### Atmospheric Emissions

#### Total CO<sub>2</sub> Emissions (Tonnes)



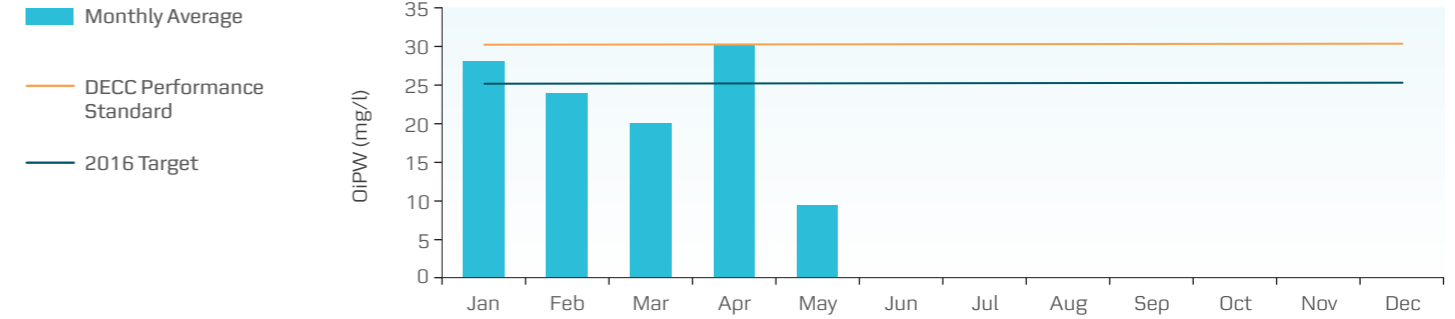
#### Combustion CO<sub>2</sub> Emissions (Tonnes)



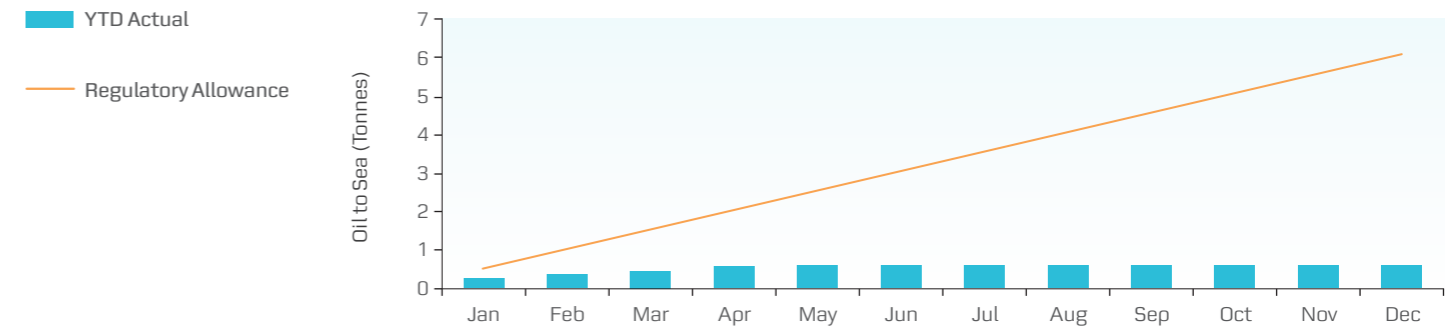
#### Flaring CO<sub>2</sub> Emissions (Tonnes)



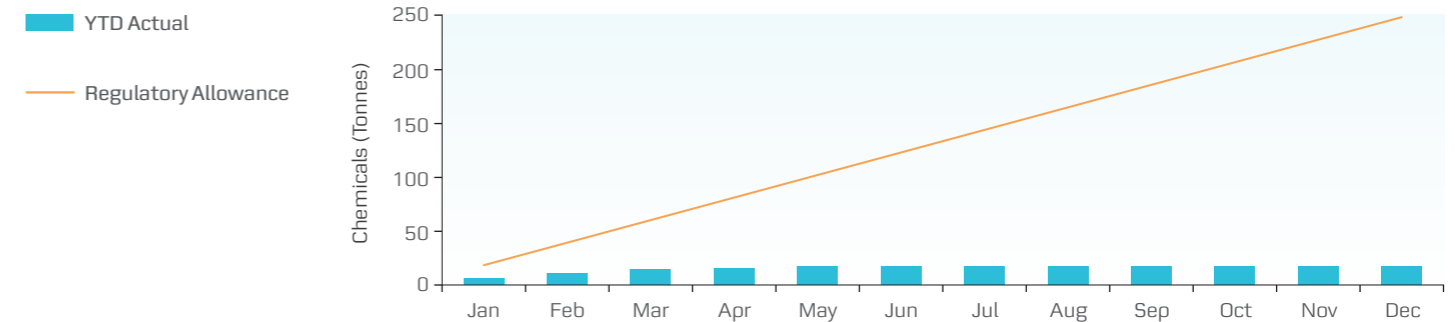
### Monthly Average OiPW (mg/l)



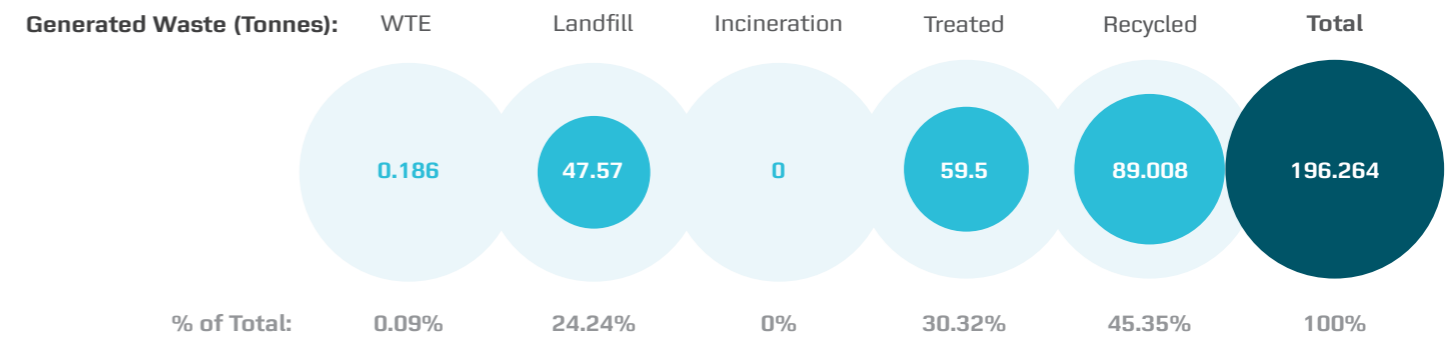
### Oil Discharge to Sea (Tonnes)



### Chemical Discharge to Sea (Tonnes)



### Waste



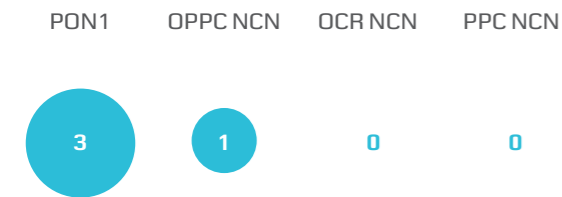
Until the time that production ceased from the Janice FPU, 2016 targets for emissions to air and discharges to sea were met, exceeding performance over 2015 by reducing the monthly average oil in produced water concentration. Production from the Janice FPU ceased in May 2016 with sailaway of the asset completed in September 2016 following extensive topside and subsea engineering worksopes. Decommissioning of the Janice, James and Affleck fields have been ongoing and continues into 2017.

# Environmental Performance Summary Gryphon Alpha

- Floating Production, Storage and Offloading Vessel (FPSO)
- Location: 175 miles north east of Aberdeen in Block 9/18b
- Currently produces from the Gryphon, Tullich and Maclure fields



## Environmental Performance



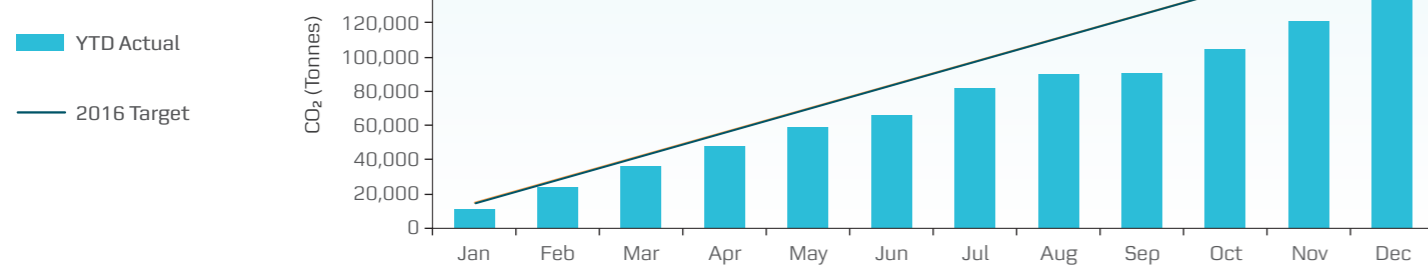
### Three PON1s:

- Subsea hydraulic leak.
- Two heating medium system leaks.

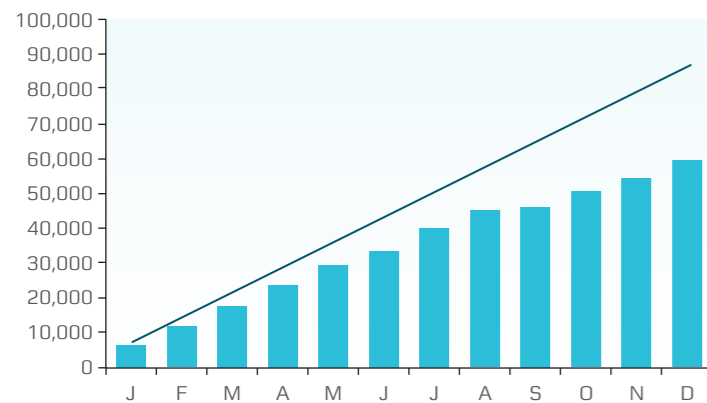
### One OPPC Non-Compliance Notifications:

- OPPC permit contained inaccuracies in the description of one of the sampling arrangements.

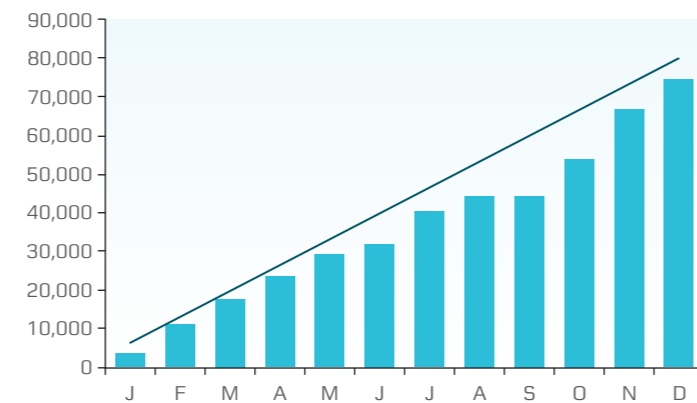
## Atmospheric Emissions



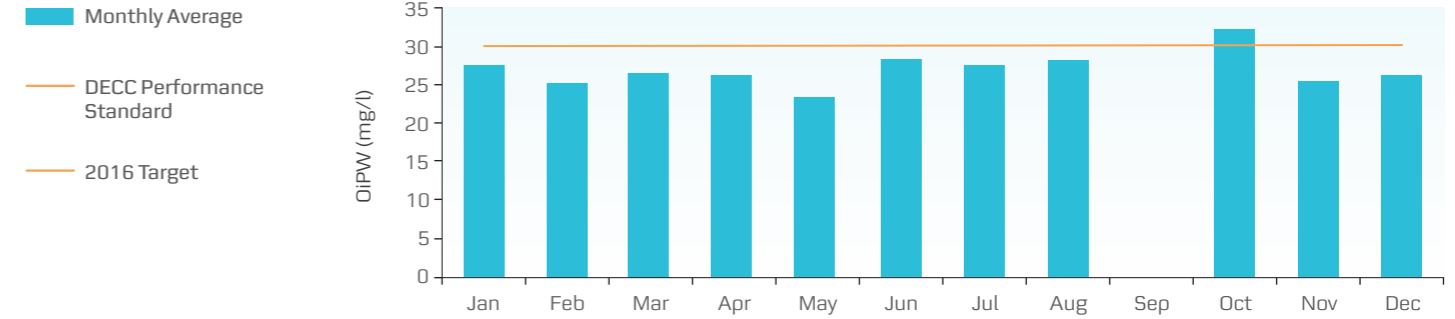
## Combustion CO<sub>2</sub> Emissions (Tonnes)



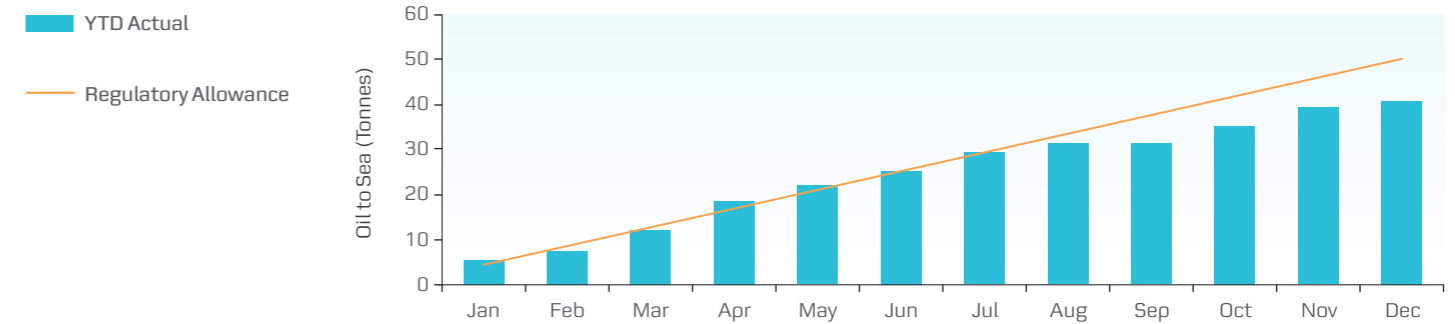
## Flaring CO<sub>2</sub> Emissions (Tonnes)



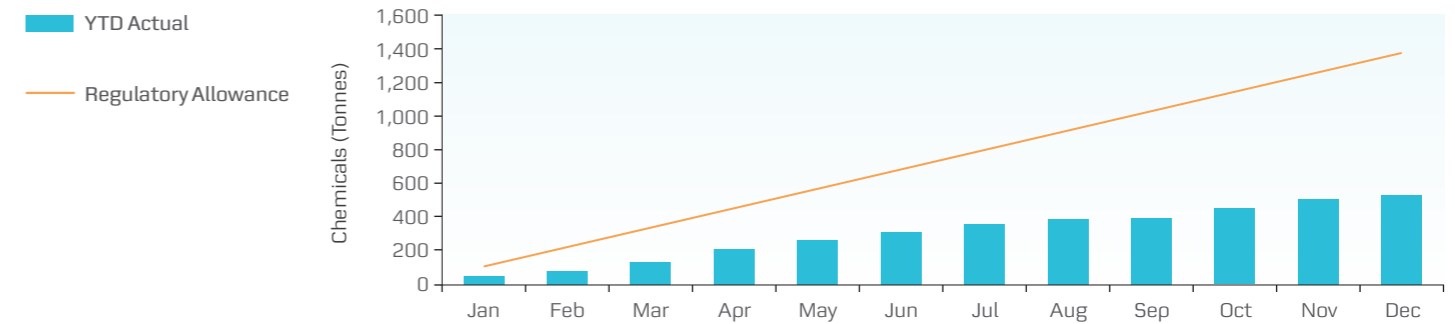
## Monthly Average OiPW (mg/l)



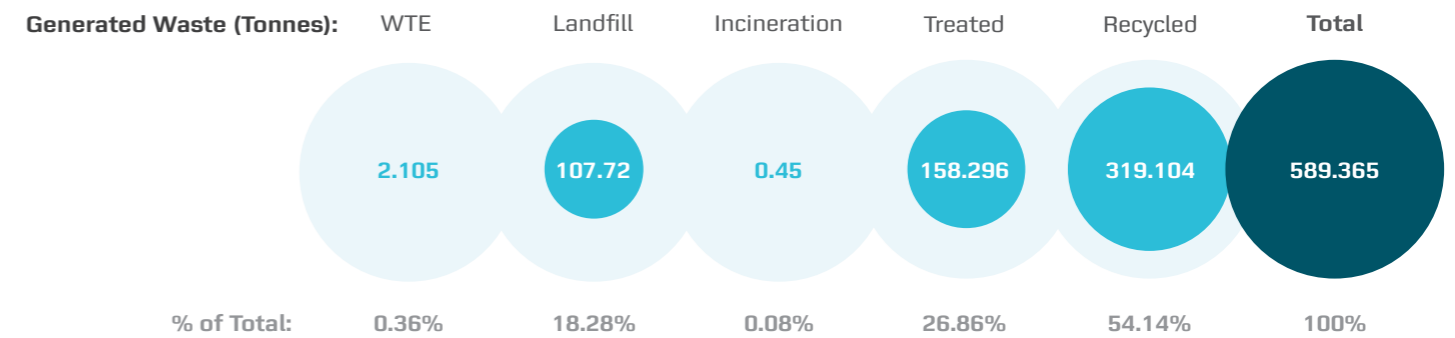
## Oil Discharge to Sea (Tonnes)



## Chemical Discharge to Sea (Tonnes)



## Waste



Compared to 2015, discharges of oil to sea, average oil in water concentration and emissions of CO<sub>2</sub> were reduced for 2016, overall environmental performance during 2016 remained stable and below internal targets.

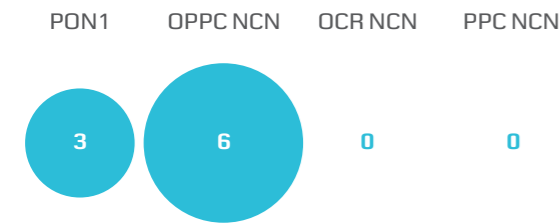
# Environmental Performance Summary

## Global Producer III

- Floating Production, Storage and Offloading Vessel (FPSO)
- Location: 137 miles north east of Aberdeen and 25 miles west of the transboundary line in Block 15/20a and 15/20b
- Currently produces from the Donan (Dumbarton), Lochranza and Balloch fields.



### Environmental Performance



#### Three PON1s:

- Leak from chemical skid entered closed drains, and returned to the process and so discharged to sea.
- Two subsea hydraulic fluid leaks.

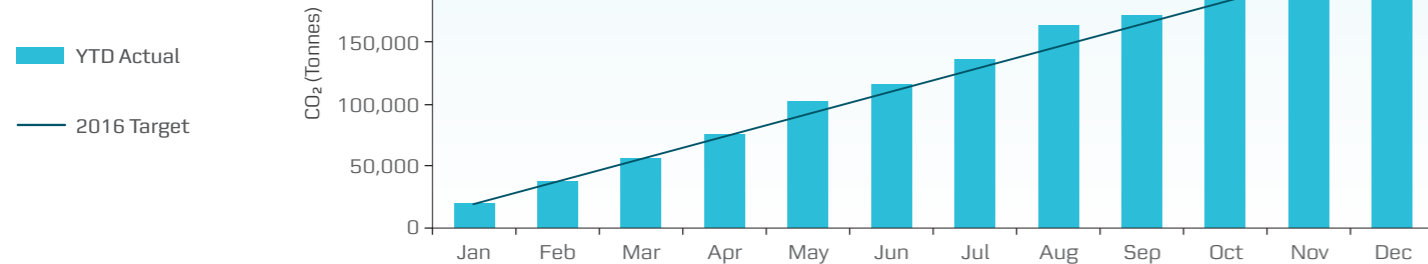
#### Six OPPC NCNs:

- Six OPPC NCN's where average monthly oil in water concentration >30 mg/L

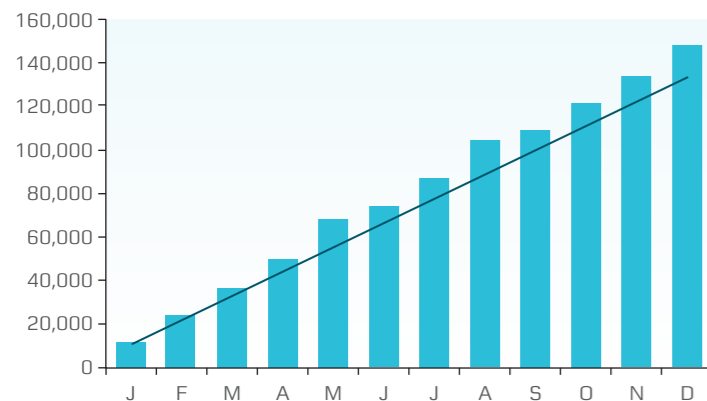
Although targets were exceeded for Oil in Water concentration, the percentage of produced water re-injected remained high, at 84 %, therefore reducing the quantity of oil discharged to sea. The MOUK produced water management strategy is to maintain PWRI capabilities in order to minimise oil and chemical discharge to sea.

### Atmospheric Emissions

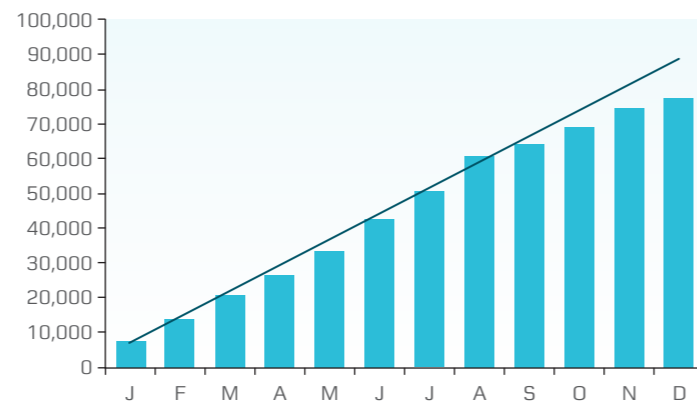
#### Total CO<sub>2</sub> Emissions (Tonnes)



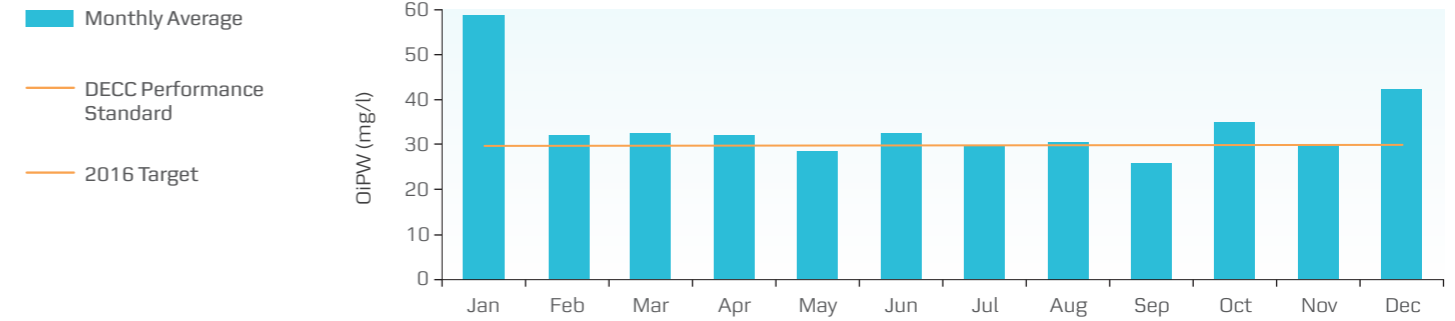
### Combustion CO<sub>2</sub> Emissions (Tonnes)



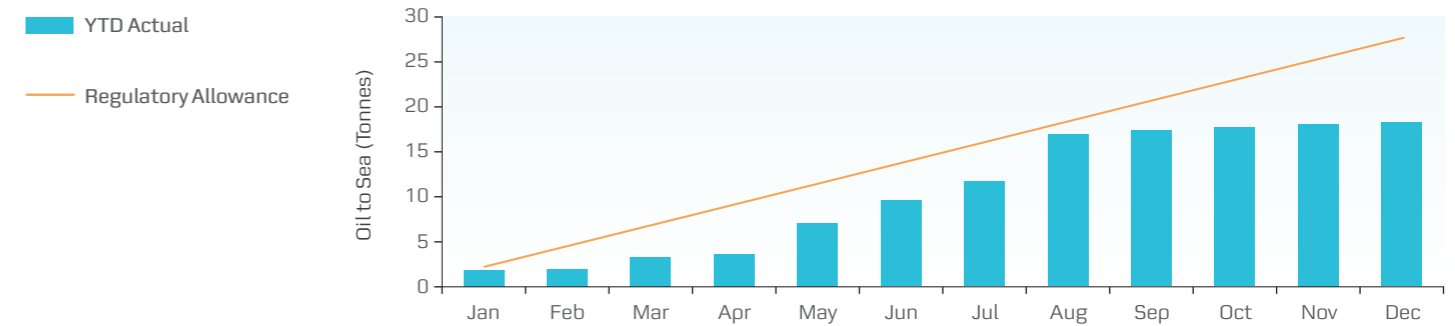
### Flaring CO<sub>2</sub> Emissions (Tonnes)



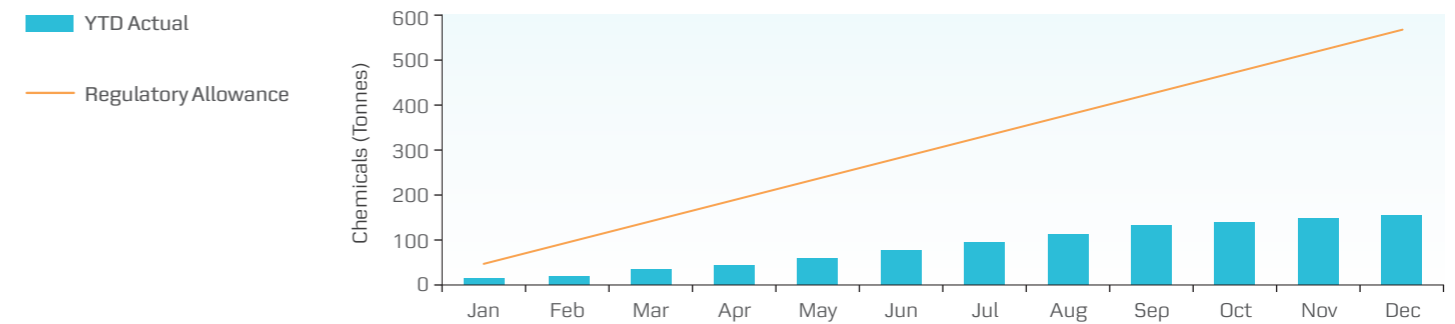
### Monthly Average OiPW (mg/l)



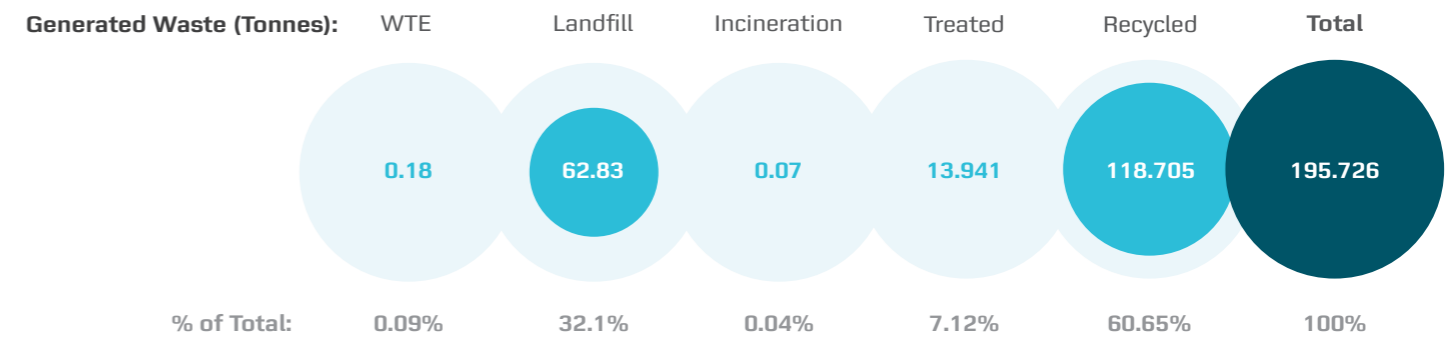
### Oil Discharge to Sea (Tonnes)



### Chemical Discharge to Sea (Tonnes)



### Waste



Compared to 2015, discharges of oil to sea and average oil in water concentration were reduced for 2016, overall environmental performance during 2016 remained stable and below internal targets. Emissions to air during 2016 increased over 2015's figures, primarily due to Gas Turbine maintenance resulting in increased diesel usage. However increased maintenance improves the reliability of the Gas Turbines and increases efficiency, therefore ultimately ensuring emissions are minimised in the longer term. GPIII OPPC compliance performance is a result of the Maersk Oil PW Management Strategy as described on page 8 discharges to sea - produced water.



# Environmental Performance Summary

## Drilling Operations



### Environmental Performance

PON1s & NCNs: PON1 OPPC NCN OCR NCN



- **Four PON1:**
  - Leak of BOP fluid from closed system.
  - Valve failure leading to unplanned discharge of water based mud.
  - Release of brine during bunkering operations.
  - Release of diesel during bunkering operations.
- **Two OCR NCNs:**
  - Unpermitted use of a chemical.
  - Over use of a permitted chemical quantity.

### Environmental Performance

During the 2016 reporting period, Maersk Oil's activities included an active drilling programme in the UKCS, involving both drilling and well abandonment operations; one exploration well drilled, Leadon well abandonments completed, and batch drilling of the Culzean field development wells commenced with top hole sections of seven wells (six production wells and 1 PWRI well) completed by end of 2016.

2016 has seen a commitment to challenging environmental key performance indicators to continual improvement in reducing our impact on the environment during drilling operations.

### Atmospheric Emissions

The majority of atmospheric emissions associated with drilling operations result from diesel combustion for power generation. Diesel use quantities depend upon the number of active rigs, well complexity and the time spent drilling. Overall diesel consumption has decreased over 2015 emissions due to the reduction in operations throughout the year.

#### CO<sub>2</sub> Emissions (Tonnes)

	Flare	Combustion	Total
Drilling 2015	3,681	9,736	13,417
Drilling 2016	0	5,688	5,688

### Discharges to Sea

Four unplanned releases to sea were recorded during 2016, any loss of containment is an unwanted event and a focus on preventing accidental releases to sea will continue to remain a high priority throughout 2017.

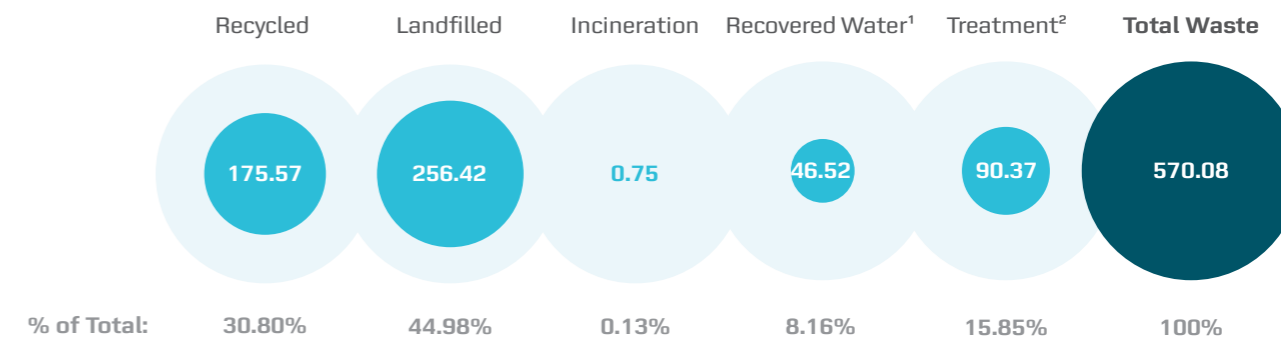
No chemicals with substitution warnings were discharged to sea during 2016. Where possible, Maersk Oil UK works closely with our chemical suppliers to replace chemicals with substitution warnings for more environmentally friendly alternatives.

### Waste Management

During drilling operations, several varied and complex waste streams are produced ranging from day to day living and galley wastes to contaminated cuttings and bulk liquid or 'slops' wastes. The number of wells and the complexity of those wells determine the type and quantity of waste generated. Overall waste generated during 2016 is lower than 2015 due to the reduction in drilling operations. Increasing recycled waste from drilling operations remains a key environmental target.

### Drilling Rig Waste

#### Generated Waste (Tonnes):



<sup>1</sup> - Water recovered from waste fluids ('slops') and cuttings sent for onshore treatment. This is discharged to industrial sewer for further treatment.  
<sup>2</sup> - Hazardous wastes sent for further treatment onshore (paints, chemicals, etc)

# ISO 14001

## Certificate of Registration

### ERM Certification and Verification Services

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Exchequer Court  
33 St. Mary Axe  
London EC3A 8AA  
Tel: +44 (0)20 3206 5281  
Fax: +44 (0)20 3206 5442  
Email post@ermcvs.com

*This is to certify that*

## **Maersk Oil North Sea UK Limited**



*at*

*Maersk House  
Crawpeel Road  
Altens  
Aberdeen  
AB12 3LG*

Certificate Number: 507  
Initial Issue Date: 18 January 2014  
Revision Date: 9 July 2014  
Expiry Date: 17 July 2017  
Version #: 2

*has been registered to ISO 14001:2004 for*



*Extraction and production of oil and natural gas at the following Maersk operated installations on the UKCS*

- *Block 15 Donan, Lochranza and Balloch Fields;*
- *Block 09 Gryphon, Tullich and Maclure Fields; and*
- *Block 30 Janice, James and Affleck field*

*and onshore support activities, including planning and organization of development and exploration for all UK operated blocks, carried out at Maersk House in Altens, Aberdeen*

This certificate is the property of ERM Certification and Verification Services Ltd and is issued subject to ERM CVS' Standard Terms and Condition of Business. Its validity may be confirmed by contacting ERM CVS as set out above.

**Signed on behalf of ERM CVS by:**

**Jeff Rose  
Head of Certification**

ERM CVS is an independent member of the world-wide Environmental Resources Management Group of Companies



**For further information or to provide comments about this report, contact:**

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