

# ANNUAL PUBLIC STATEMENT ENVIRONMENTAL MANAGEMENT SYSTEM 2018

**Petrofac Facilities  
Management Limited**

# INTRODUCTION

This report is Petrofac Facilities Management Limited's 2018 annual public statement for environmental management, covering our UK Operations.

Prepared in line with the reporting requirements of the UK's Department for Business, Energy and Industrial Strategy, it meets the requirements of the Oslo Paris (OSPAR) Convention Recommendation 2003/5. This report outlines our Environmental Management System (EMS) and focuses on our 2018 environmental performance.

## WORKING RESPONSIBLY

Our EMS was developed alongside our Health, Safety, Security and Environment framework and the ISO 14001 standard for environmental management. It enables us to manage the environmental impacts arising from our activities and is based on the internationally approved 'Plan-Do-Check-Act' process. This ensures we have the philosophy, procedures and methods in place to manage significant environmental risks throughout the life cycle of our projects.

As a provider of managed solutions to our clients in the UKCS we fulfil the role of 'Operator' on behalf of the asset owner. As a result, our EMS has been designed to support our operating responsibilities:

- The environmental goals for the prevention and elimination of pollution from offshore sources and the protection and conservation of the maritime area against other adverse effects of offshore activities
- Provision of trained emergency and oil spill responders and specialist emergency response facilities
- Continual improvement in environmental performance



# CONTENTS

04 Thinking Differently About Delivery

06 Our Operating Models

08 Our Offshore Operations

12 Environmental Management System

13 Managing our Impact on the Environment

14 Environmental Objectives and Targets

15 Environmental Performance of Assets

15 Miller

16 Anasuria FPSO

18 Schooner and Ketch

20 Kittiwake

22 FPF 1

24 Hewett

26 Ensco 72

28 Paul B. Lloyd Jr

30 Irish Sea Pioneer



**Our vision is to reach  
Horizon Zero; a future  
with no accidents or incidents**

# THINKING DIFFERENTLY ABOUT DELIVERY

As a leading service provider to the oil and gas production and processing industry, we design, build, operate and maintain oil and gas facilities.

We think differently about delivery. By providing standalone or integrated services we align our approach to meet our clients' operating strategies and project objectives, unlocking significant value.

One example of this is our innovative Operator models, which have evolved from the Duty Holder service we pioneered in 1997, whereby we take responsibility for the Safety Case on behalf of a client.



# OUR OPERATOR MODELS

Following the introduction of the 2015, Safety Case Regulations, our outsourced Duty Holder model evolved to incorporate Installation Operator (including Duty Holder) responsibility; to manage the environmental aspects of an installation.

Responsibility for wells and pipelines (Well Operator and Pipeline Operator) can be combined within one outsourced model called Service Operator.

## SERVICE OPERATOR

**ANASURIA OPERATING COMPANY (AOC), ANASURIA CLUSTER AND FPSO, UKCS**

During 2018, as Service Operator for AOC we managed the Anasuria FPSO and associated pipelines. We have focused on providing an integrated and aligned approach to the operation and development of the cluster to support our client in its objective to extend the life of the field.

## WELL OPERATOR

**HURRICANE ENERGY AND TULLOW OIL**

In 2018, as Hurricane Energy's appointed Well Operator, we undertook the re-entry and completion of two wells in the Greater Lancaster Area, west of Shetland, utilising the Paul B.Lloyd Jr semi-submersible drilling rig.

As Well Operator for Tullow Oil, we also plugged and abandoned seven wells in the Southern North Sea using the Ensco 72 jack-up drilling rig.

## INSTALLATION OPERATOR

**FPF 1, Miller, Kittiwake, Schooner and Ketch platforms, Hewett platforms, and Irish Sea Pioneer**

Throughout 2018 our Installation Operator portfolio included the FPF 1 floating production facility, the Miller platform, Kittiwake platform, Irish Sea Pioneer, Hewett, and Schooner and Ketch platforms.



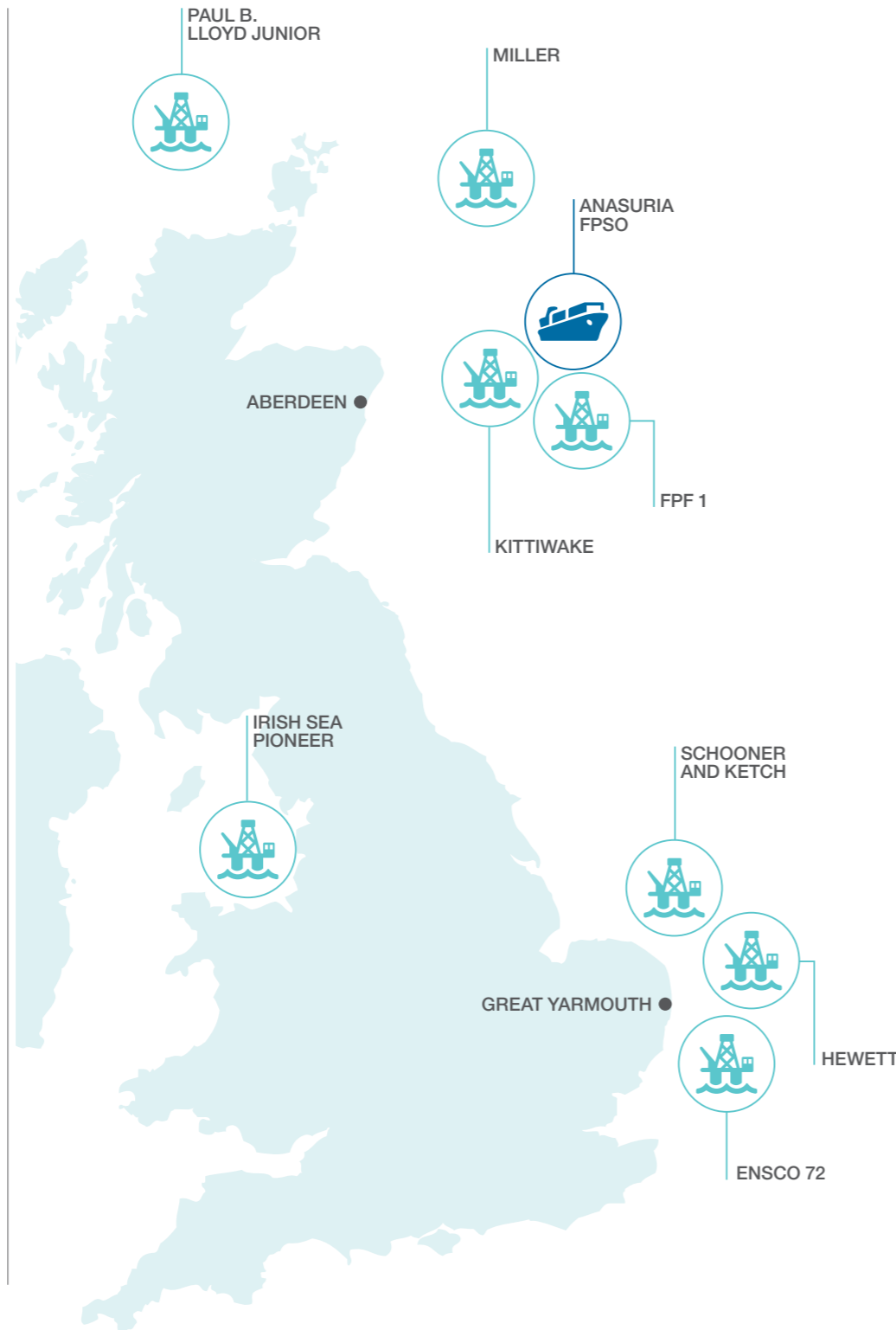
# OUR OFFSHORE OPERATIONS

On behalf of their owners we currently operate a range of platforms and undertake offshore oil and gas production activities including:

- Non-producing intervention vessel operation
- Oil and gas production platform operation
- Late-life/decommissioning platform operations
- Drilling activities with third-party rig provision

Under the requirements of this disclosure, the UKCS Operator responsibilities and UKCS assets highlighted within this statement include:

- **Service Operator (including Installation Operator) – The Anasuria FPSO, Irish Sea Pioneer, BP Miller, Schooner and Ketch, Kittiwake**
- **Well Operator – Ensco 72 and Paul B. Lloyd Jr drilling rigs**



## Miller

Miller decommissioning activity was successfully completed during the summer of 2018, culminating in the removal of the jacket structure in July 2018.

The environmental permits that supported the decommissioning activity included: term permits for oil and chemical discharges; Marine Licence for seabed deposits; Consent to Locate for vessel activity and a Miller installation Oil Pollution Emergency Plan (OPEP).

Following the removal of the jacket structure, the Miller Consent to Locate and OPEP were surrendered as per environmental protocol.



## Anasuria FPSO

The Anasuria FPSO is owned by Anasuria Operating Company, a joint venture between Hibiscus Petroleum Berhad and Ping Petroleum Limited. It is located 175km east of Aberdeen.

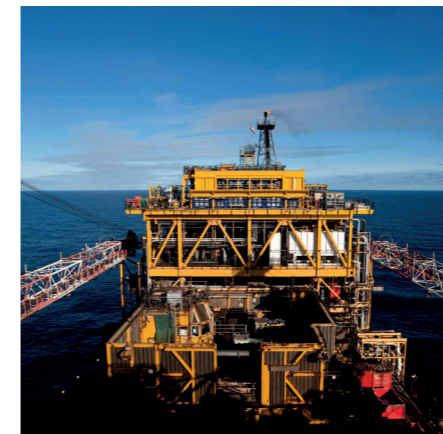
In 2016, Petrofac was awarded a Service Operator contract for the FPSO and associated cluster, with responsibility for the installation and pipelines with exception of the Cook pipelines.



## Schooner and Ketch

Schooner and Ketch, located in the fields of the same name in the Southern North Sea, are normally unmanned gas platforms. Petrofac has been Duty Holder for the Schooner and Ketch assets since 2005 on behalf of current and previous owners Faroe Petroleum and Tullow Oil respectively.

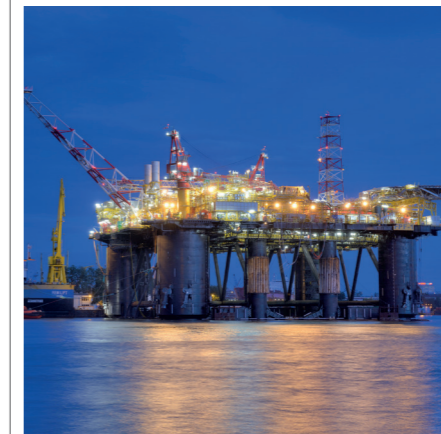
In March 2017, Petrofac became Installation Operator and assumed responsibility for the environmental performance for assets.



## Kittiwake

Petrofac has been the Duty Holder for the Kittiwake, a fixed steel jacket platform in the Central North Sea, since 2004, on behalf of current and previous owners EnQuest, Centrica and Venture Production respectively.

In June 2017, Petrofac became Installation Operator and assumed responsibility for the environmental performance for the asset.



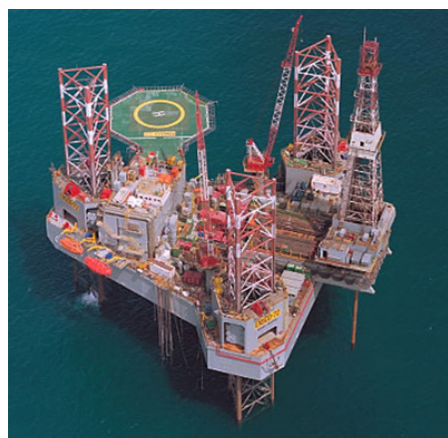
## FPF 1

The FPF 1 is a floating production facility, located in the Greater Stella Area in the Central North Sea, that has been in operation since 2016. Petrofac has been Duty Holder for FPF 1 on behalf of Ithaca Energy since 2011 and became Installation Operator in May 2018.



## Hewett

Petrofac has been the Duty Holder for the Hewett platforms since 2003 on behalf of current and previous owners Eni and Tullow Oil respectively. In January 2018, Petrofac became Installation Operator. Located in the Southern North Sea, there are four platforms: The Hewett Complex (48/29Q, AP and A-FTP), 48/29 B, 48/29 C and 52/5A. The Complex is permanently manned whilst 48/29 B, 48/29 C and 52/5A are Not Permanently Attended Installations (NPAI).



### Enco 72

Petrofac was the appointed Well Operator on behalf of licensee Tullow Oil for a seven well plug and abandonment campaign in the Southern North Sea. The jack-up drilling rig, owned by Enco Plc, carried out the work in the Orwell, Thurne, Wissey and Wren fields.



### Paul B. Lloyd Jr

Petrofac was the appointed Well Operator on behalf of the licensee Hurricane Energy for the re-entry and completion of two wells in the Greater Lancaster Area. The semi-submersible drilling rig, owned by Transocean, carried out the work in the Lancaster Field.



### Irish Sea Pioneer

Petrofac has been Installation Operator of the Irish Sea Pioneer since 2015, prior to which Petrofac had been Duty Holder of the asset since 2006.

The non-producing mobile platform is owned by ENI and provides intervention services to ENI's operations in the Liverpool Bay area.

## PETROFAC LIMITED ENVIRONMENTAL POLICY

### Vision

Petrofac will be recognised as a company that maximizes energy efficiency and conducts business in an environmentally responsible manner.

### Commitment

The Petrofac Board of Directors has ultimate responsibility for environmental performance and is committed to the achievement of environmental excellence. Petrofac and its business units are therefore committed to:

- Conducting its business in an environmentally responsible manner, consistent with its 'Horizon Zero' initiative which aims to eliminate all incidents within the company
- Promoting a strong culture of leadership in environmental matters
- Encouraging all employees to share our environmental commitments and take personal responsibility for protecting the environment
- Complying with all applicable environmental laws, regulations, relevant standards, and compliance obligations
- Minimising our impact on the environment through pollution prevention, minimising waste and emissions and the efficient use of energy and other resources
- Transparency in the reporting of the Company's environmental performance and sharing of knowledge
- Setting objectives and targets for continual improvement with auditing and monitoring of performance

### Objectives

To meet this commitment at Group level Petrofac will:

- Develop and maintain Petrofac minimum standards and expectations
- Publish regular performance reports and openly discuss our environmental performance with internal and external stakeholders
- Periodically review the suitability and effectiveness of this policy, our management systems, targets and objectives

Each Petrofac business unit will:

- Provide suitable resources for the protection of the environment
- Develop and maintain environmental management systems that comply with ISO 14001, the International Standard for Environmental Management Systems
- Provide appropriate training to all employees to enable them to carry out their work with due respect and care for the environment
- Engage with clients, contractors and suppliers to deliver a high standard of environmental performance

### Responsibility and implementation

Environmental protection is a line responsibility that starts with the Group Chief Executive and flows down through the line management structure to front line employees performing work. Every leader at Petrofac is responsible for proactively leading the management of risks to the environment with their teams. Every Petrofac employee is responsible for making themselves aware of the risks to the environment in their work area and to proactively play their part in reducing these risks. All employees are empowered to speak up if they have any environmental concerns.

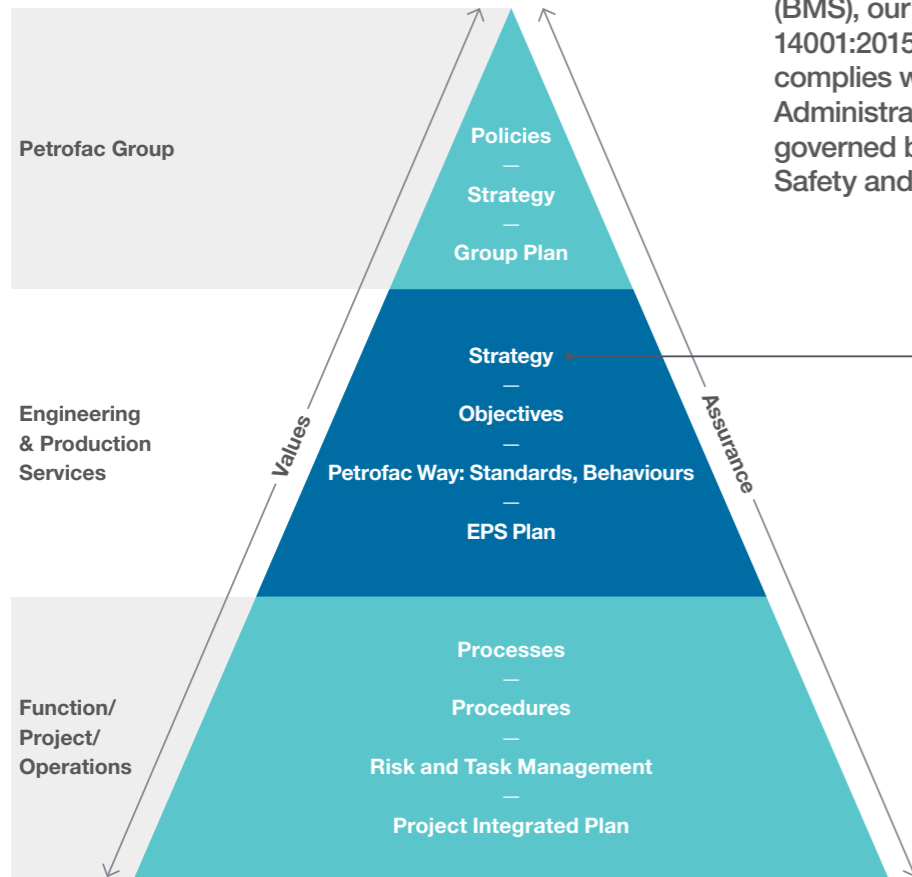
Ayman Asfari, Group Chief Executive



March 2017

# ENVIRONMENTAL MANAGEMENT SYSTEM

## HSE MANAGEMENT STRATEGY



As part of our Business Management System (BMS), our EMS is certified to the ISO 14001:2015 International Standard, and complies with the Oil Spill Prevention, Administration and Response Fund. It is governed by the Petrofac Group Health Safety and Environment Management Strategy.

### HSE MANAGEMENT STRATEGY ELEMENTS

1. Leadership and accountability
2. People and competence
3. Subcontractors, suppliers and partners
4. Customers, products and services
5. Community and stakeholders
6. Risk assessment and management
7. Design and construction
8. Operations and maintenance
9. Management of change
10. Information and documentation
11. Incident investigation and analysis
12. Crisis and emergency management
13. Assessing and improving effectiveness

Our EMS is flexible enough to maintain continuity with existing practices during the transfer of platforms to the Petrofac system, whilst taking on board best practice where identified which is then shared across other assets.

# MANAGING OUR IMPACT ON THE ENVIRONMENT

Specific areas of our offshore operations require daily focus to ensure their impact on the environment is managed effectively. These include:

## DISCHARGES TO SEA

### OIL IN WATER

Water is extracted from wells, along with oil and gas. The water, known as produced water, is then separated from the oil and treated. Although treatment removes most of the oil from the water, residual traces are still discharged. These traces are regulated and released under permitted conditions.

### DRILL CUTTINGS DISCHARGE

Drill cuttings and fluids discharged from drilling operations can also contain residual oil associated with the formation.

### CHEMICAL DISCHARGES

Prior to approval and discharge for use offshore, chemicals are subjected to a risk assessment. The potential impact from chemical discharges is graded using the ranking system below:

COLOUR BANDING		INITIAL OFFSHORE CHEMICAL NOTIFICATION SCHEME (OCNS) GROUPING	
GOLD	Lowest hazard	Initial grouping	
SILVER	↓	A	
WHITE		B	
BLUE		C	
ORANGE		D	
PURPLE		Highest hazard	E

## ATMOSPHERIC EMISSIONS

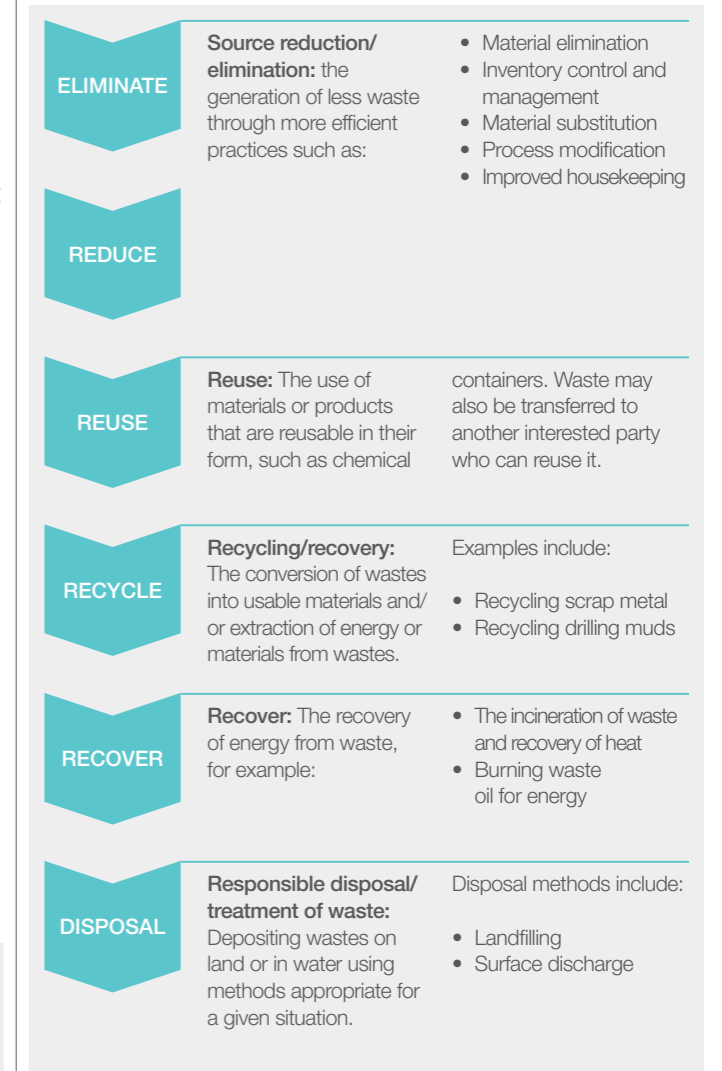
The combustion of diesel and gas to generate power and the burning of flare gas creates atmospheric emissions of Carbon Dioxide (CO<sub>2</sub>) and other combustion products including:

- Nitrous oxides
- Sulphurous oxides
- Carbon Monoxide (CO)
- Methane (CH<sub>4</sub>)
- Other Volatile Organic Compounds (VOCs)

During activities on the assets, refrigerant gases are used offshore, primarily to support living conditions and equipment cooling. This activity is regulated and reported on annually.

## WASTE MANAGEMENT

Waste generated offshore is managed to allow maximum reuse or recycling of materials before being treated, incinerated or disposed to landfill. Petrofac follows the waste management hierarchy below:



## PETROLEUM OPERATIONS NOTICE AND NON-COMPLIANCE REPORTING

All notices and non-compliance are recorded within Petrofac's incident management system, detailing the circumstances, investigation, outcomes and actions. The system is also used for lesson sharing and incident trending to assist with continuous improvement.

### PETROLEUM OPERATIONS NOTICE

Any spill to sea of oil or chemical is reported to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) using the Petroleum Operations Notice (PON 1).

The loss of any objects to sea which may have an impact on the environment or sea users are reported to OPRED using a PON 2 Notice.

### NON-COMPLIANCE

A non-compliance against any of the permit conditions is reported using the appropriate format to OPRED.

# ENVIRONMENTAL OBJECTIVES AND TARGETS

## 2018 OBJECTIVES

## 2018 ACHIEVEMENTS

Roll-out new Compliance Management system within Operated Assets	Compliance tool in use
Roll-out computer based chemical management training	Continued to raise awareness of training on assets. Continue development in 2019
Roll-out Environmental Management System awareness	Continued roll-out on new assets, including ISO 14001 scope extended to FPF1

## CONTINUOUS IMPROVEMENT

In 2018, all Petrofac managed sites were successfully incorporated into the scope of the ISO 14001 Certification. Further integration of the management system with the Business Management System is planned for 2019, along with data standardisation and hazards and effect identification.

Integration of EMS with new Business Management System governance framework	Develop Environmental Hazards and Effects identification tool kit
Environmental Data Standardisation across installation operations	Environmental input to leadership engagement process

## ENVIRONMENTAL PERFORMANCE

# MILLER

Miller decommissioning activity was successfully completed during the summer of 2018, culminating in the removal of the jacket structure in July 2018.

## DISCHARGES TO SEA

### OILY DISCHARGES

8 kgs of hydrocarbon was discharged to sea during caisson removal activity, using methodology agreed with OPRED. This discharge was significantly less than the worst case estimation of 1.01 tonnes of hydrocarbon used for permitting purposes. A successful caisson pump out campaign prior to the caisson removal activity proved to be highly effective in minimising the release of residual hydrocarbons.

### CHEMICAL USE AND DISCHARGE

During the cutting of the Miller jacket structure, legacy chemicals used for asset integrity purposes were discharged to sea. A chemical discharge of 4,027 kgs made up of oxygen scavenger, biocide and control fluid was estimated based on the original chemical usage data. However, it is unlikely that this discharge figure was realised due to chemical degradation that would have occurred over the years following initial usage.

## REPORTS AND NOTIFICATION

During 2018, two hydrocarbon release events were reported through the PON1 reporting system:

### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Hydrocarbon spotting on sea surface	Unknown	0.1
ROV control fluid loss	Hydraulic oil	0.001



# ENVIRONMENTAL PERFORMANCE

## ANASURIA FPSO

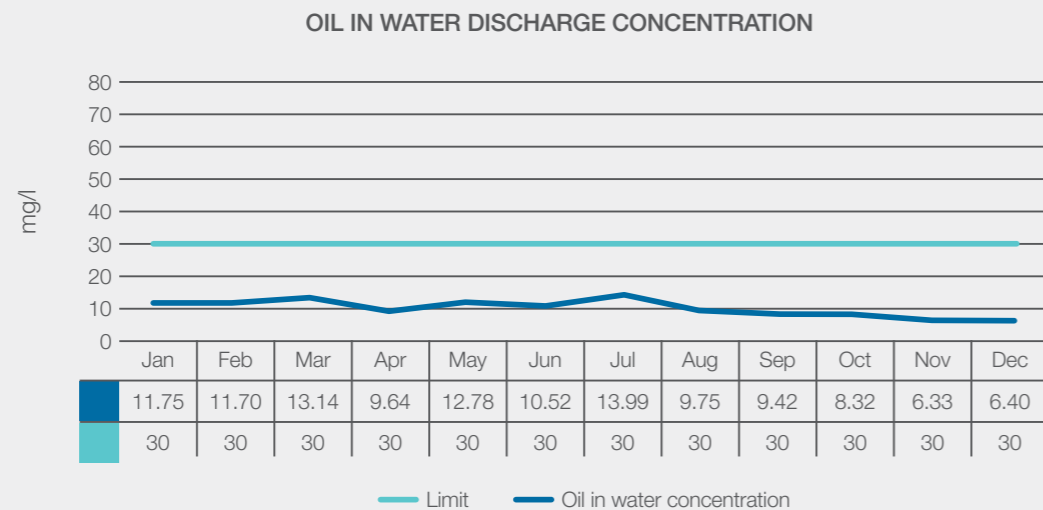
The environmental permits in place for the Anasuria FPSO are associated with oily water discharges to sea, offshore chemical use and discharge and atmospheric emissions from power generation, flaring and use of refrigerant compounds.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

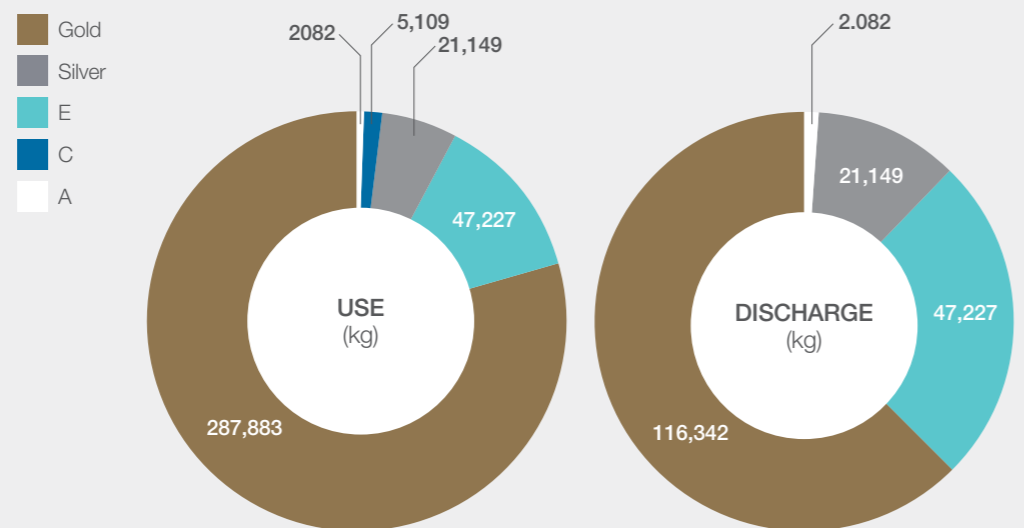
Water discharges are monitored and reported in accordance with the Oil Pollution, Prevention and Control Permit. The average oil in water concentrations over both discharges for the period was 10.04 mg/l.

The total volume of water and mass of oil discharged over the period of operation was 1,241,229 m<sup>3</sup> and 12,463 kg of oil.



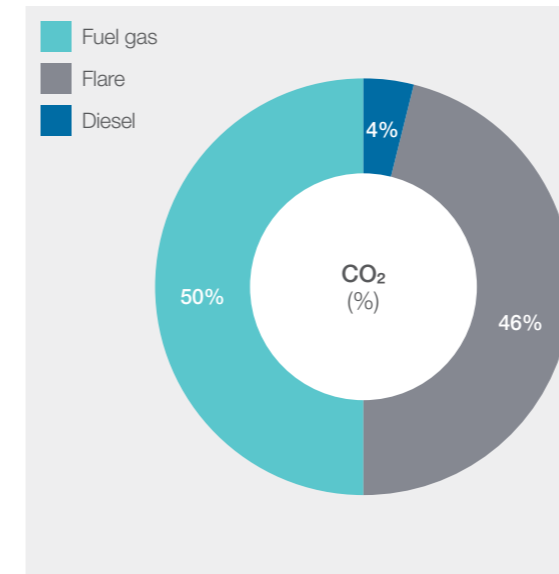
#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Anasuria FPSO are in the least harmful Gold and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

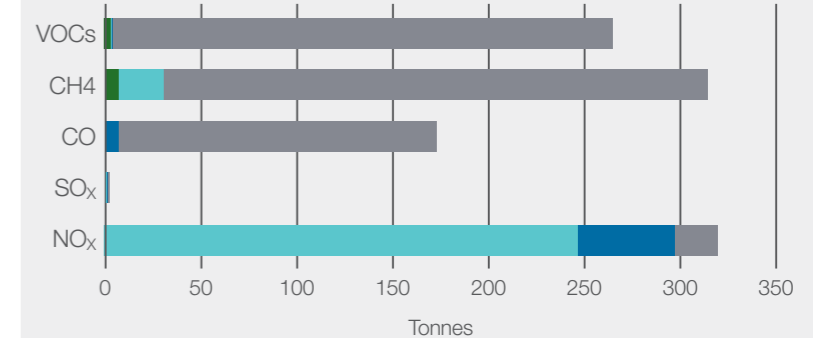


### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources are flaring and venting gas. 153,384 tonnes of CO<sub>2</sub> emissions were verified for greenhouse gas reporting purposes. Other emissions were reported through the Environmental Emissions Monitoring System.



#### EMISSIONS BY SOURCE



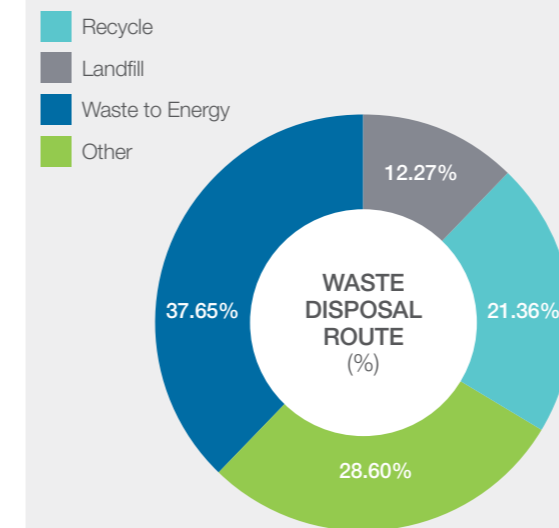
Source	NO <sub>x</sub>	SO <sub>x</sub>	CO	CH <sub>4</sub>	VOCs
Vent	0	0	0	9.95	5
Fuel Gas	239.38	0.36	1.22	25.99	1.02
Diesel	50.81	3.55	9.82	0.14	1.49
Flare	33.17	0.03	173.49	258.94	261.44

There are three hydrochlorofluorocarbon (HCFCs) refrigerant compounds and two non HCFC refrigerant gases in use on the Anasuria FPSO. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	1.61	0	1430	0.00
HFC-404a	18	4	3922	16.47
HFC-417a	30.4	11.58	2346	27.17
HC-600a (Isobutane)	0.297	0	3	0.00
R407f	23	0	42	0.00
<b>TOTAL</b>	<b>73.267</b>	<b>15.78</b>		<b>43.64</b>

### WASTE MANAGEMENT

301 tonnes of waste was managed onshore. The disposal routes are charted:



### REPORTS AND NOTIFICATION

During 2018 there were two releases of crude oil reported. There was one unpermitted discharge of chemical reported and closed out through the PON 1 reporting system and one reported permitted discharge notification.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Remote sheen observation	Crude oil	0.01
Observed alongside FPSO	Crude oil	0.001
Release from subsea hose	Methanol	0.124

A total of two non-compliances with permit conditions were submitted to OPRED during 2018:

Permit	Non-Compliance	No.
Oil discharge Permit	Produced water meter outage	1
Oil discharge Permit	Late calibration of OIW correlation graph	1

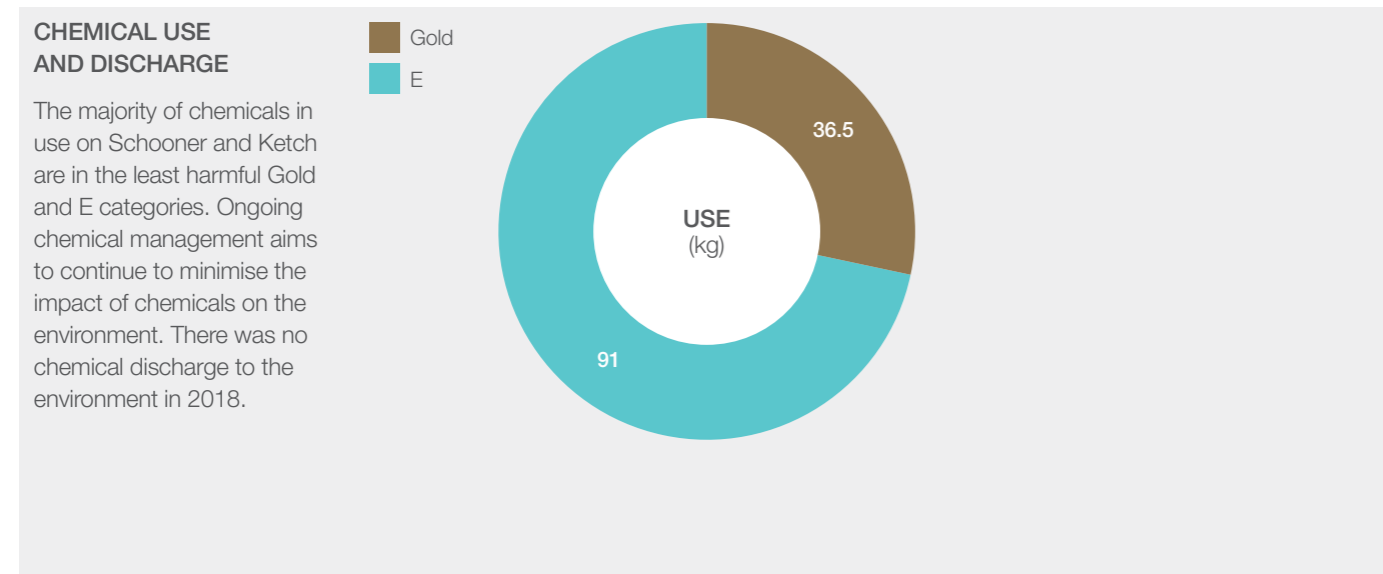
## ENVIRONMENTAL PERFORMANCE

# SCHOONER AND KETCH

Schooner and Ketch are normally unmanned gas platforms in the Southern North Sea. They entered cessation of production in August 2018 and are currently undergoing preparation ahead of rig arrival for plugging and abandonment of wells. They have no produced water discharges and minimal chemical use. Power for the assets is provided by diesel generators. There is no fuel gas or flare combustion.

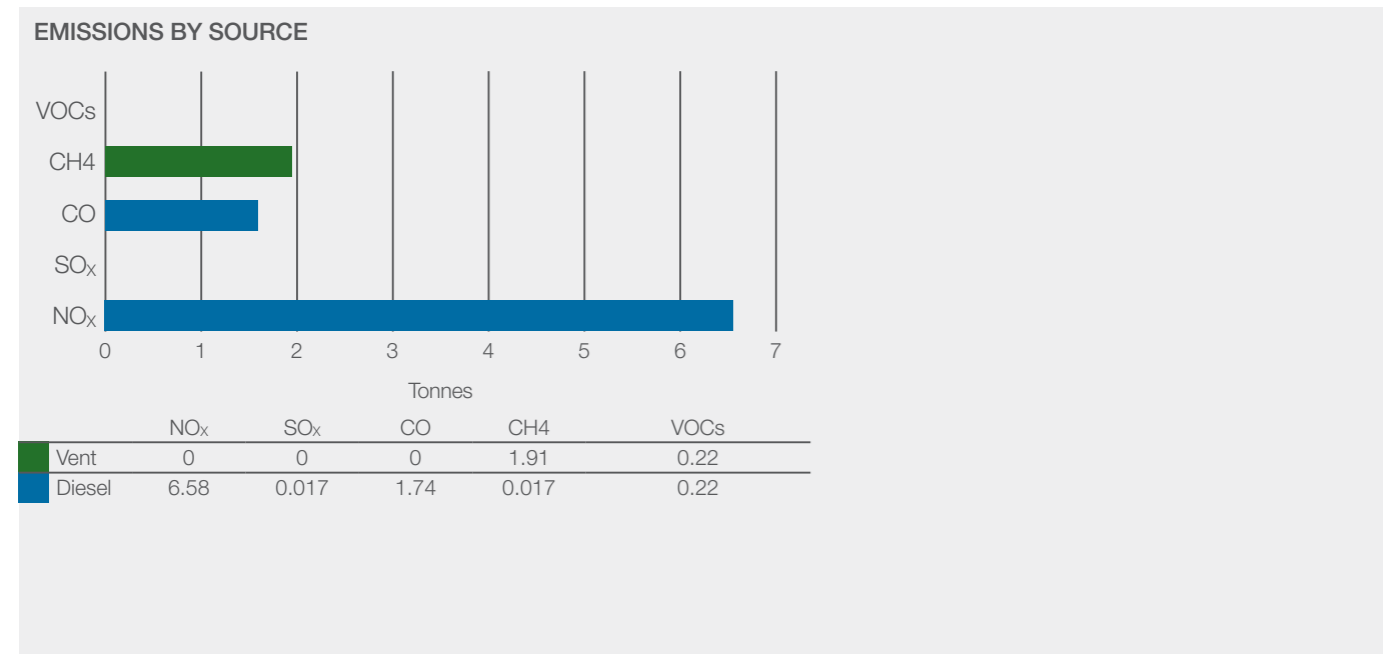
### DISCHARGES TO SEA

During the reporting period, there were no planned discharges to sea on the Schooner or Ketch platforms.



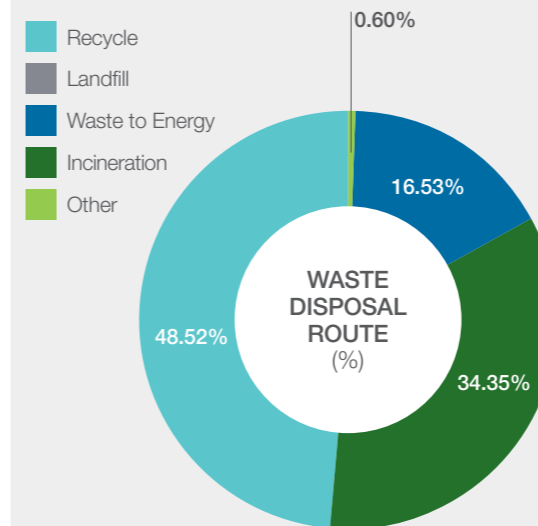
### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources include venting gas. 354 tonnes of CO<sub>2</sub> emissions were estimated to have been emitted from the Schooner and Ketch platforms during the reporting period.



### WASTE MANAGEMENT

23.26 tonnes of waste was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

In 2018 there were three unplanned releases of hydraulic oil to sea resulting in PON 1.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Solenoid failure	Hydraulic oil	0.060
Pressure gauge O-ring failure	Hydraulic oil	0.004
Platform crane hose	Hydraulic oil	0.002

# ENVIRONMENTAL PERFORMANCE

## KITTIWAKE

The environmental permits in place for the Kittiwake platform are associated with oily water discharges to sea, offshore chemical use and discharge and atmospheric emissions from power generation, flaring and use of refrigerant compounds.

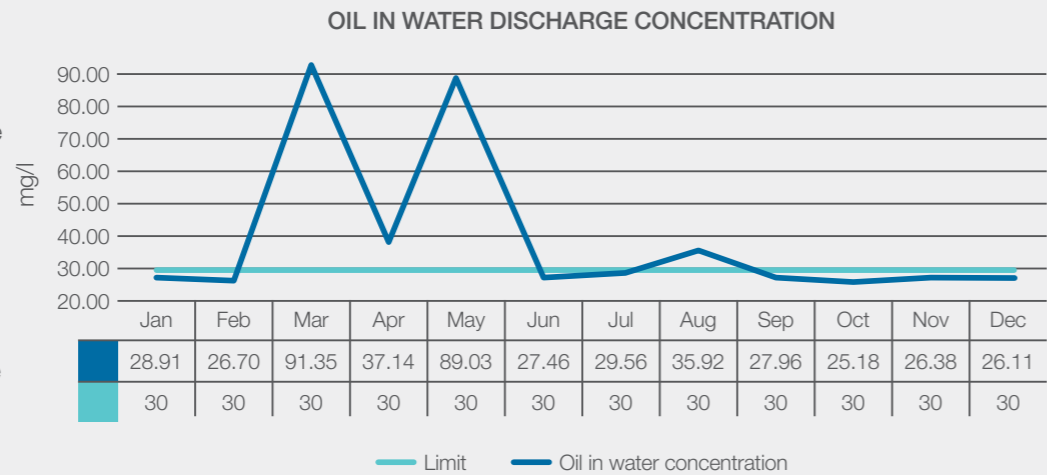
### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

Water discharges are monitored and reported in accordance with the Kittiwake Oil Pollution, Prevention and Control Permit. The annual average dispersed oil in produced water discharge concentration from Kittiwake for the period was 38 mg/l.

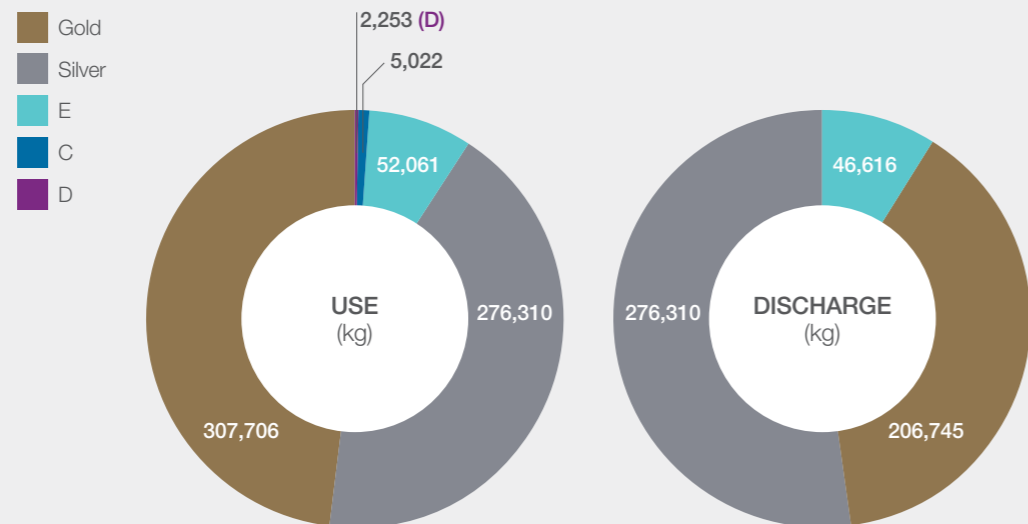
During the first half of 2018, the average oil in water discharge concentration was 48 mg/l compared to an average of 27 mg/l for the second half of 2018.

The total produced water discharge to sea in 2018 was 1,261,513m<sup>3</sup> with an associated oil mass of 48 tonnes.



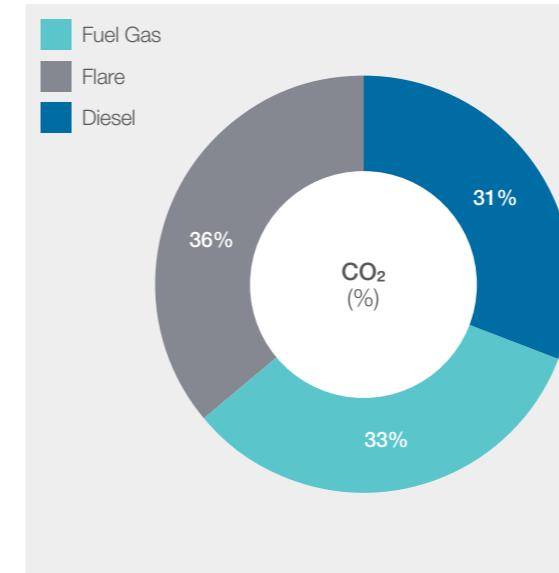
#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Kittiwake are in the least harmful Gold, Silver and E categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

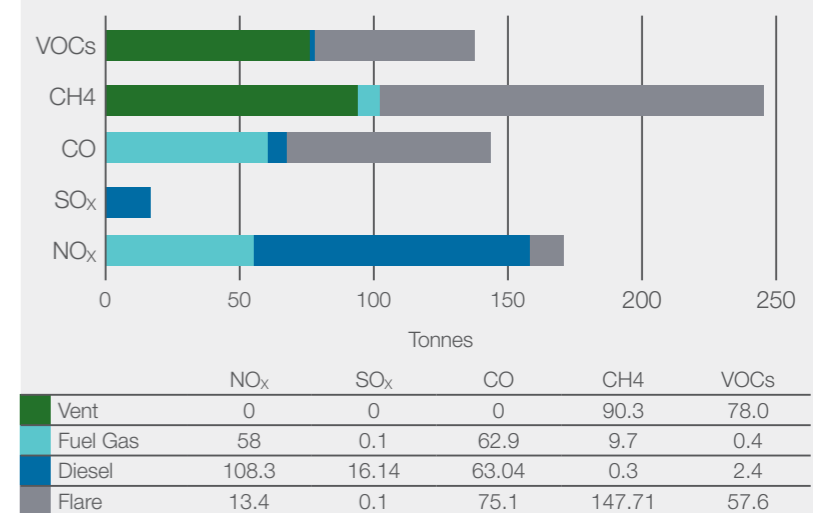


### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources are flaring and cold venting of hydrocarbon gas. 83,073 tonnes of CO<sub>2</sub> was emitted during the period. This equates to a 26% reduction in CO<sub>2</sub> emissions compared to 2017 levels, primarily due to compression equipment upgrades, resulting in a significant reduction in flare gas volumes. The chart below outlines the split of CO<sub>2</sub> emissions between the various Kittiwake fuel sources. Other atmospheric emissions were reported through the Environmental Emissions Monitoring System. A summary of the non-CO<sub>2</sub> emissions discharged during the period is below:



#### EMISSIONS BY SOURCE

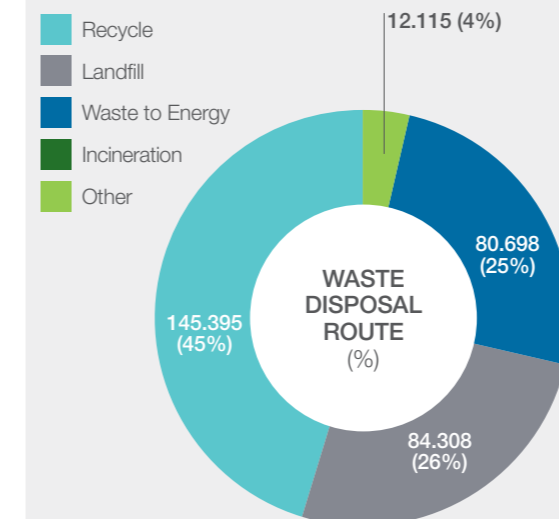


There were four hydrofluorocarbons (HFCs) refrigerant gases and one hydrocarbon (HC) refrigerant gas in use on Kittiwake. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	2.74	0	1,430	0
HFC-404a	6.25	2.70	3,922	10.59
HFC-407c	45.00	37.00	1,774	65.64
HFC-417a	49.00	0	2,346	0
HC-600a (Isobutane)	0.87	0	3	0
<b>TOTAL</b>	<b>102.99</b>	<b>39.70</b>	<b>-</b>	<b>76.23</b>

### WASTE MANAGEMENT

323 tonnes of waste generated on the platform was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

During the reporting period, two PON 1 notifications, one PON 10 notification, and twenty-one OPPC non-compliance notifications were submitted to OPRED.

#### PON 1 PERMITTED DISCHARGE NOTIFICATIONS (PDNs)

Activity	Oil/Chemical type	Discharge (t)
Plant restart	Oil	0.287
Plant restart	Oil	0.065

Permit	Non-Compliance	No.
Oil discharge permit	Monthly average OIW limit exceeded	5
Oil discharge permit	Maximum OIW limit exceeded	13
Oil discharge permit	Hazardous drains recovery pump issue	3
Oil discharge permit	Produced water quantification issue	1
Consent to locate	Naming board lighting issue	1

# ENVIRONMENTAL PERFORMANCE

## FPF 1

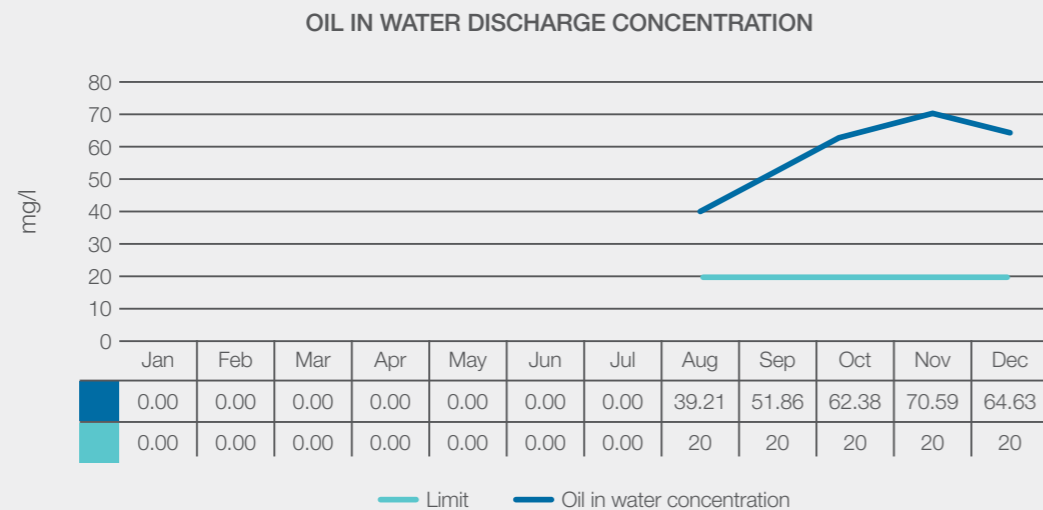
The environmental permits in place for the FPF 1 are associated with oily water discharges to sea, offshore chemical use and discharge and atmospheric emissions from power generation and flaring. The permits were transferred to Petrofac Facilities Management on Wednesday, 1 August 2018 from Ithaca Energy. The data in this report covers from this date, 1 August 2018, to the end of 2018.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

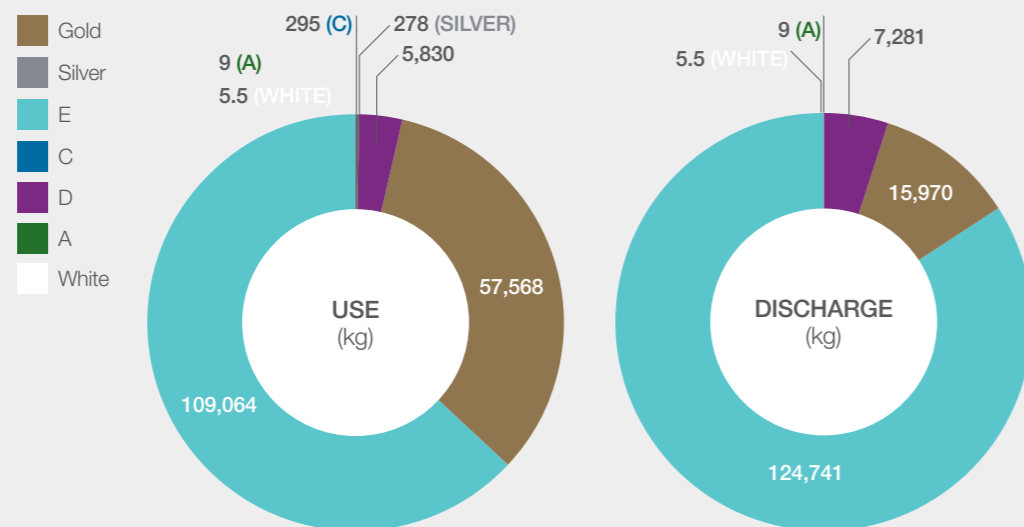
Water discharges are monitored and reported in accordance with the Oil Pollution, Prevention and Control Permit. The average oil in water concentrations for the period was 57.7mg/l.

The total volume of water and mass of oil discharged over the period of operation (August to December 2018) was 37,580m<sup>3</sup> and 2,275kg of oil.



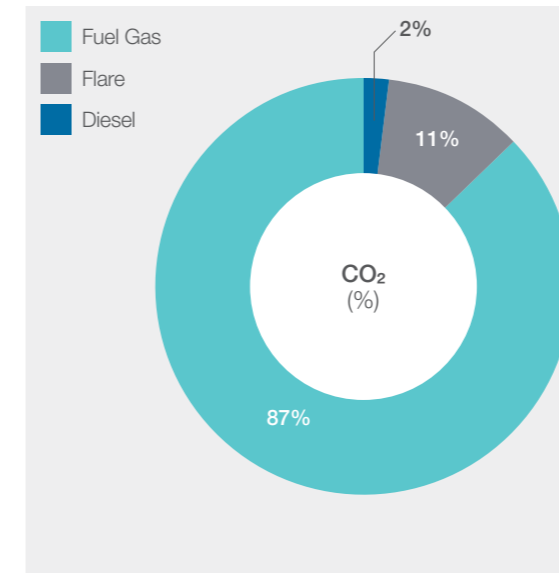
#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the FPF 1 are in the E and Gold categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

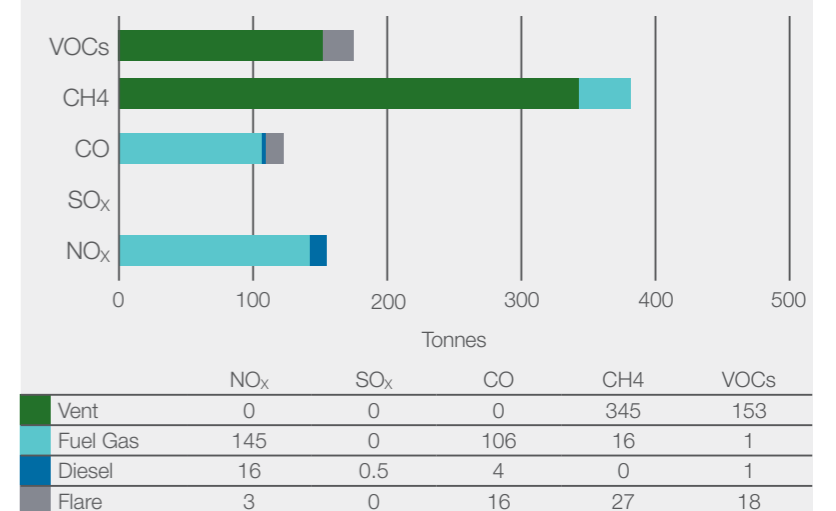


### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Other sources are flaring and venting gas. 59,967 tonnes of CO<sub>2</sub> emissions were verified for greenhouse gas reporting purposes between August and December 2018. Other emissions were reported through the Environmental Emissions Monitoring System.



#### EMISSIONS BY SOURCE

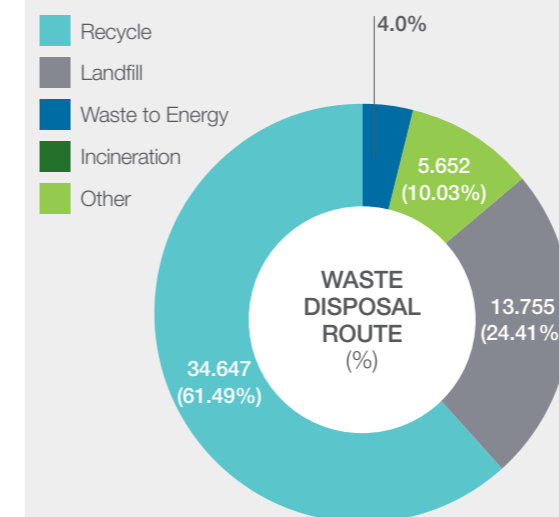


There are four hydrofluorocarbons (HFCs) refrigerant compounds in use on the FPF 1. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	3	0	1,430	0
HFC-404a	48	0	3,922	0
HFC-407c	881.9	39	1,774	69
HFC-417a	5	3	2,346	6
<b>TOTAL</b>	<b>937.9</b>	<b>42</b>	<b>-</b>	<b>75</b>

### WASTE MANAGEMENT

56.346 tonnes of waste was managed onshore between August and December 2018. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

From August to December 2018, there were three releases of oil reported. There were four unpermitted discharge of chemical reported and closed out through the PON 1 reporting system.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Hydraulic operated mooring system chain	Hydraulic oil	0.002619
Unknown sheen (not FPF 1 related)	Diesel/fuel oil	0.02
Hydraulic operated mooring system chain	Hydraulic oil	0.003492
Methanol system	Methanol	0.002
Methanol system	Methanol	0.002
Methanol system	Methanol	7.192
Cooling medium release	TEG & Corrosion inhibitor	1.3 and 0.0025

A total of 13 non-compliances with permit conditions were submitted to OPRED during August to December 2018:

Permit	Non-Compliance	No.
Oil discharge permit	Monthly discharge limit exceeded	5
Oil discharge permit	OIW sample limit exceeded	5
Oil discharge permit	Location of hazardous drain sample is different to that as stated in the OPPC permit	1
Chemical permit	Increased use of hydraulic fluid	2

# ENVIRONMENTAL PERFORMANCE

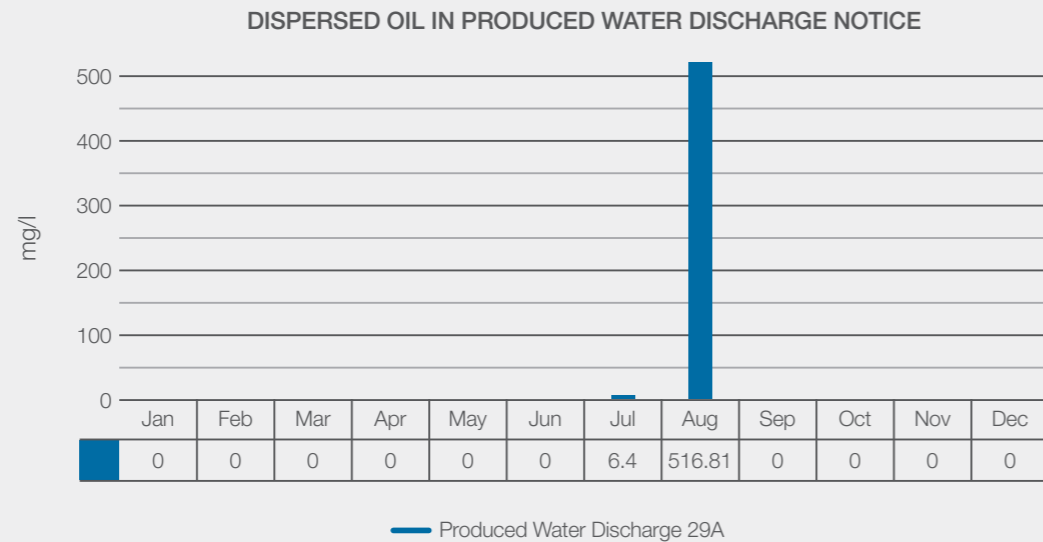
## HEWETT

The environmental permits in place for the Hewett Field Complex, blocks 48/29 B, 48/29 C and 52/5A are associated with oily water discharges to sea, offshore chemical use and discharge and atmospheric emissions from power generation.

### DISCHARGES TO SEA

#### OIL IN PRODUCED WATER

Recommissioning of the produced water to sea discharge work scopes were carried out in 2018. Water discharges are monitored and reported in accordance with the Oil Pollution, Prevention and Control Permit. Produced water discharges to sea are still to be reinstated. The average oil in water concentrations over the period was 261.6 mg/l.

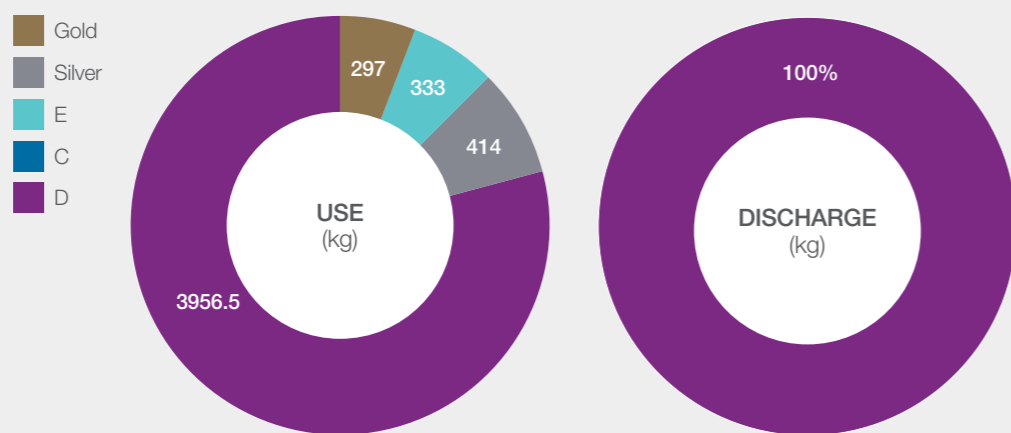


The total volume of water and mass of oil discharged over the period of operation was 11 m<sup>3</sup> and 1 kg of oil.

#### CHEMICAL USE AND DISCHARGE

The majority of chemicals in use on the Hewett Complex, blocks 48/29 B, 48/29 C and 52/5A are D categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

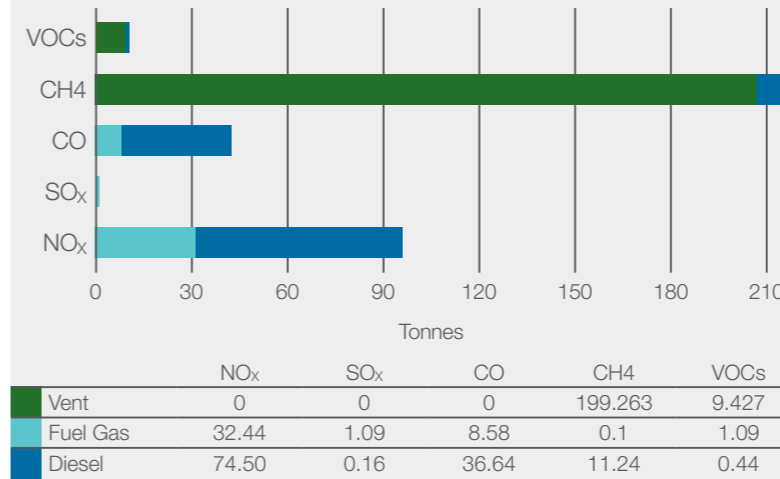
**Note:** Only one chemical discharge, subsea hydraulic fluid.



### DISCHARGES TO ATMOSPHERE

Power generation is the main source of atmospheric emissions. Another source is venting gas. 34,437 tonnes of CO<sub>2</sub> emissions were verified for greenhouse gas reporting purposes. Other emissions were reported through the Environmental Emissions Monitoring System.

#### EMISSIONS BY SOURCE

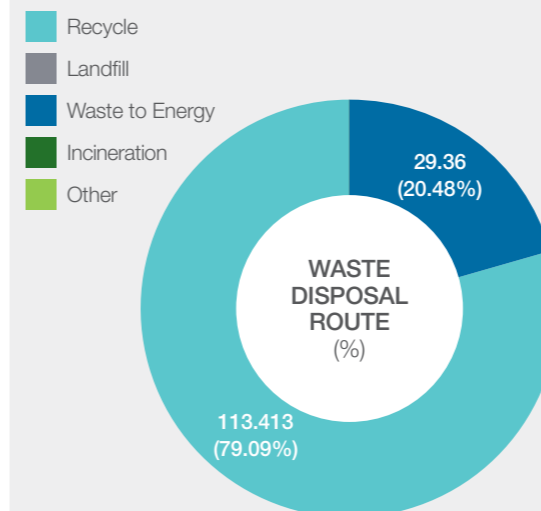


There are four hydrofluorocarbon (HFCs) refrigerant compounds and one hydrocarbon (HC) refrigerant gas in use on the Hewett Complex. The inventory and emission details are monitored and reported:

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	2.02	0	1,430	0
HFC-227ea	102	0	3,220	0
HFC-407c	7.6	0	1,774	0
HFC-422d	6.5	0	2,729	0
HC-600a	1.33	0	3	0
<b>TOTAL</b>	<b>119.45</b>	<b>0</b>	<b>-</b>	<b>0</b>

### WASTE MANAGEMENT

143.4 tonnes of waste was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

During 2018 there was one release of hydrocarbons reported and closed out through the PON 1 reporting system, and one reported chemical discharge reported and closed out through the PON 1 reporting system. There was no unpermitted discharge of chemical reported.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Hydraulic leak to sea	Hydraulic leak	0.21
Condensate release	Condensate and water mix	0.04

A total of two non-compliances with permit conditions were submitted to OPRED during 2018:

Permit	Non-Compliance	No.
Chemical permit	27.24kg De-foamer AF400 used above permitted usage	1
OPPC	OIW sample limit exceeded	1

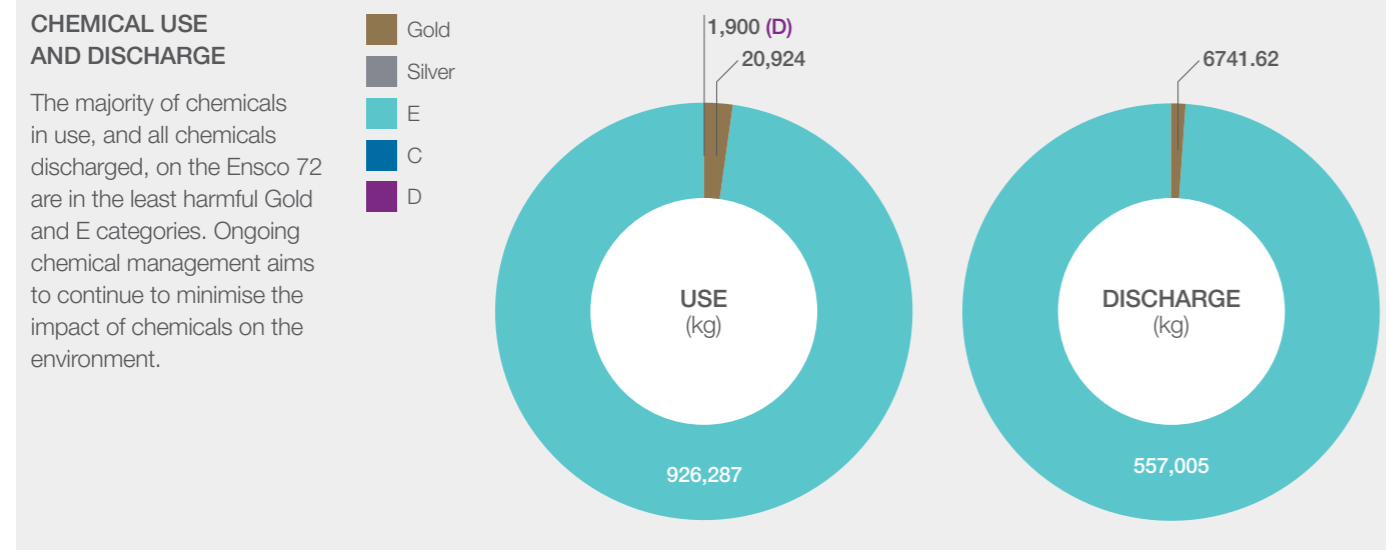
# ENVIRONMENTAL PERFORMANCE

## ENSCO 72

The Ensco 72 jack-up drilling rig completed a seven well plug and abandonment (P&A) campaign in the Thames Area location between April and October 2018.

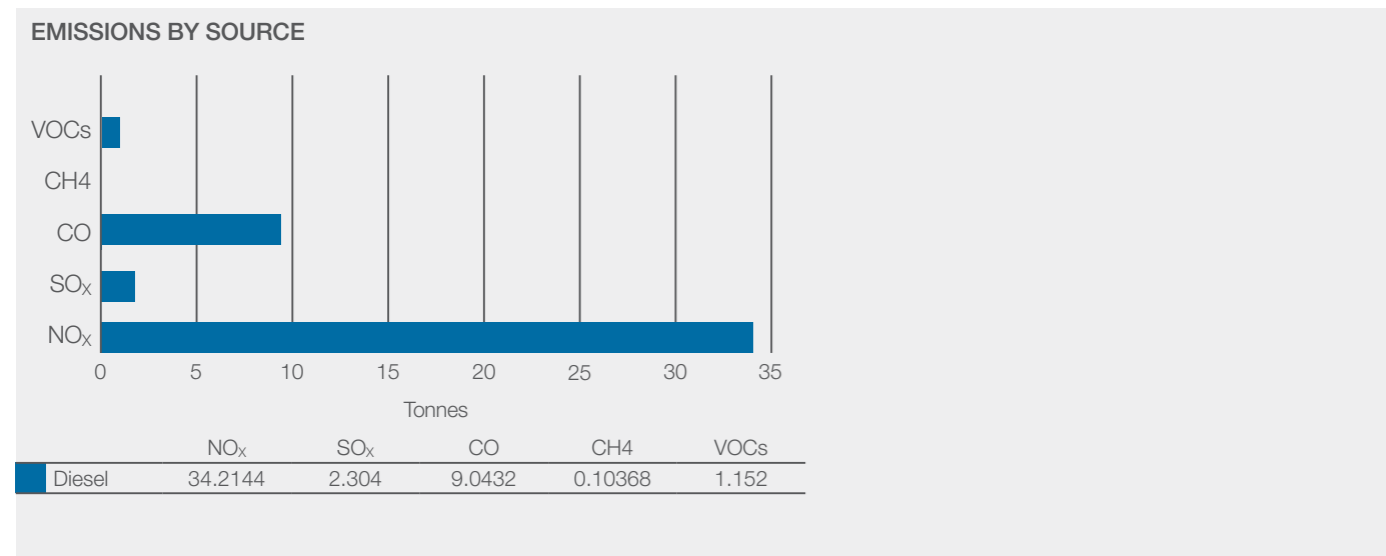
### DISCHARGES TO SEA

Well Intervention Fluids Discharge	
Total volume of Well Intervention Fluids Discharged (m3)	1365.71
Total weight of dispersed oil in Fluids Discharged (t)	0.03334
Average concentration of oil in Well Intervention Fluids (mg/l)	20.353



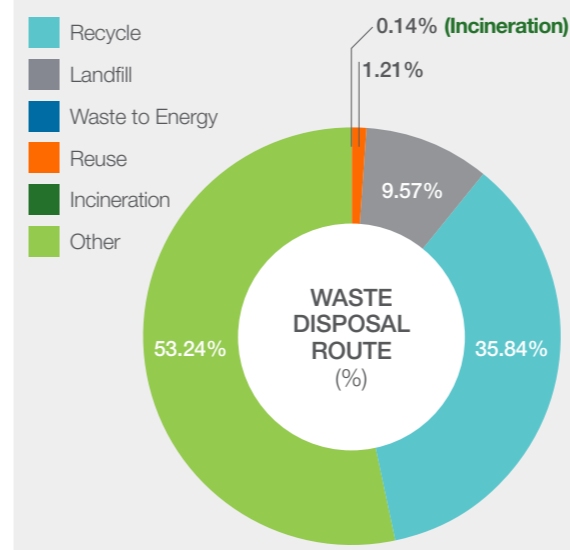
### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines and gas flaring gas drilling operations. The main combustion product is Carbon Dioxide (CO<sub>2</sub>). A total of 1843.2 tonnes of CO<sub>2</sub> were emitted from the sources described below:



### WASTE MANAGEMENT

A total of 1,106.078 tonnes of waste was brought onshore for disposal. A large proportion of this waste included special waste and required further treatment prior to disposal under licence.



### REPORTS AND NOTIFICATION

During the campaign there were two PON2 notifications submitted by the Ensco 72.

The reportable events submitted during the P&A activities are indicated below:

PON2 Notification Details		
Activity	Notification Type	Description
Recovering BOP	PON 2	Loss of 13" x 7/8" ring gasket
ROV Operations	PON 2	Loss of ROV

# ENVIRONMENTAL PERFORMANCE

## PAUL B. LLOYD JR

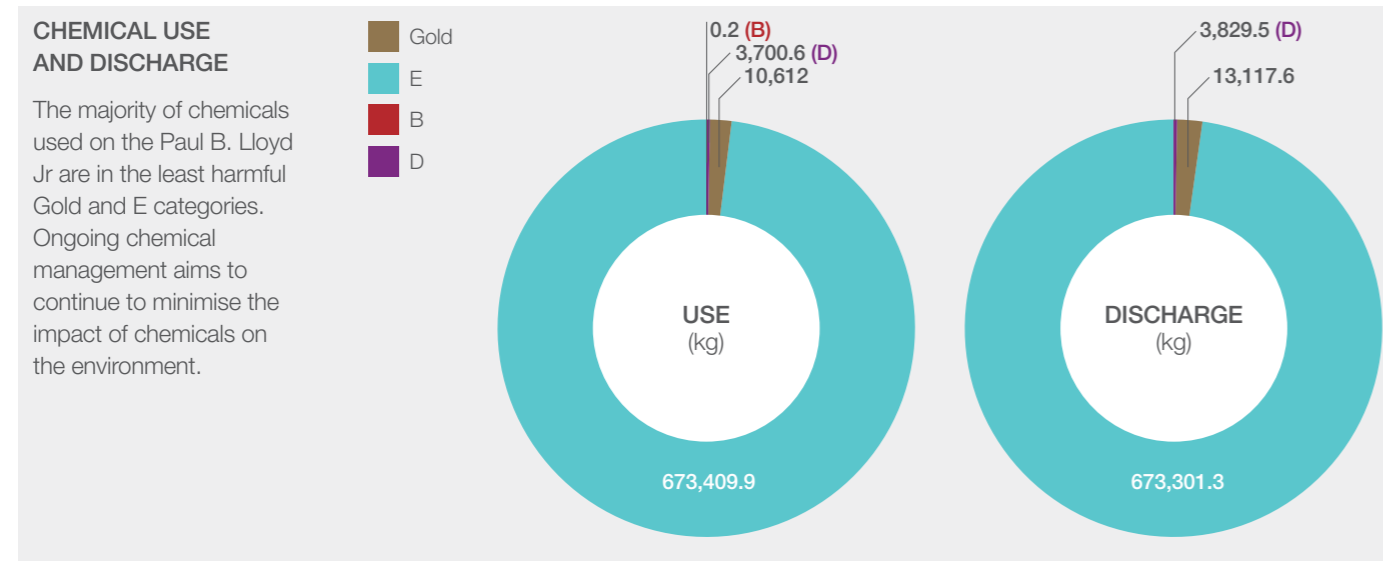
The Paul B. Lloyd Jr semi-submersible drilling rig undertook the re-entry and completion of two suspended wells in the Greater Lancaster area between May and July 2018.

### DISCHARGES TO SEA

#### WELL INTERVENTION FLUIDS DISCHARGE

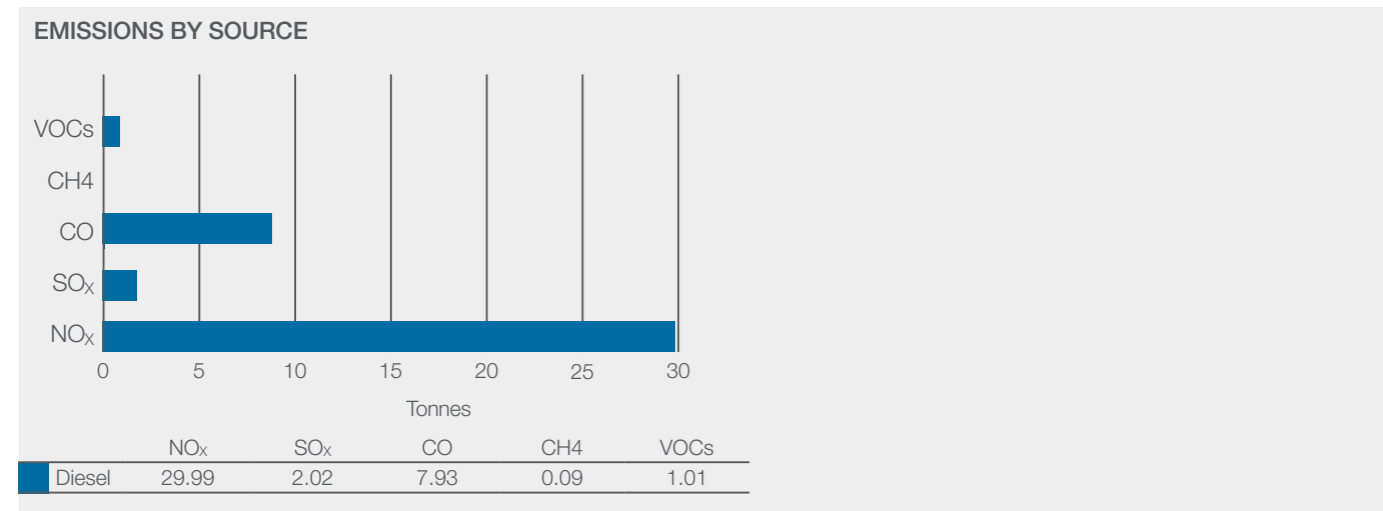
The total Well Intervention Fluids discharged to sea during P&A activities is detailed below:

Total volume of Well Intervention Fluids Discharged (m3)	779
Total weight of dispersed Oil in Fluids Discharged (t)	0.0093
Average concentration of oil in Well Intervention Fluids (mg/l)	11.94



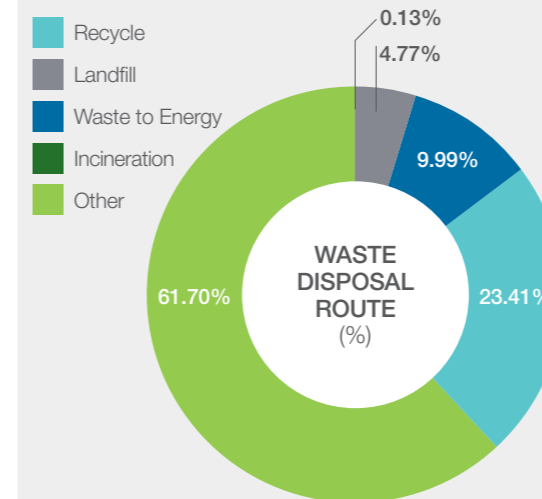
### DISCHARGES TO ATMOSPHERE

Emissions to atmosphere generated from drilling activities are associated with power generation using diesel fuelled engines and gas flaring gas drilling operations. The main combustion product is Carbon Dioxide (CO<sub>2</sub>). A total of 1615.7 tonnes of CO<sub>2</sub> were emitted from the sources described below:



### WASTE MANAGEMENT

A total of 52.742 tonnes of waste was brought onshore for disposal from the Paul B. Lloyd Jr during its activities. A large proportion of this waste included special waste and required further treatment prior to disposal under licence.



### REPORTS AND NOTIFICATION

During its activities for Petrofac, PON 1 Notifications were submitted by the Paul B Lloyd Junior drilling rig. The details of which are indicated below:

Activity	Oil/Chemical type	Discharge (t)
Failure of slip joint packer	Brine, Biocide, Oxygen Scavenger, Corrosion Inhibitor, Scale Inhibitor, H <sub>2</sub> S Scavenger and Hydraulic Fluid	3,192

No permit non-compliances occurred during the activities.

# ENVIRONMENTAL PERFORMANCE

## IRISH SEA PIONEER

The Irish Sea Pioneer (ISP) has no production capability and is powered by diesel generators. Emissions to the environment are related to the maintenance of the accommodation and movement of the vessel. The environmental permits in place for ISP are associated with offshore chemical use and discharge, and atmospheric emissions from power generation.

### DISCHARGES TO SEA

#### CHEMICAL USE AND DISCHARGE

Gold

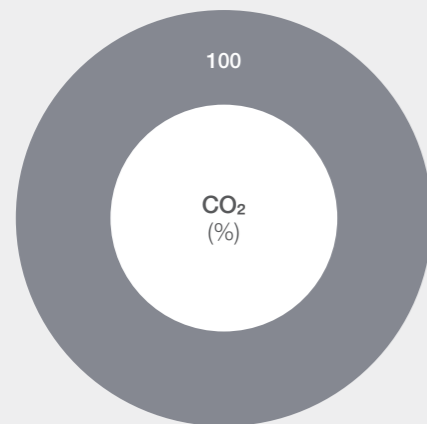
The chemicals in use on ISP are either non-CHARM or Gold categories. Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.



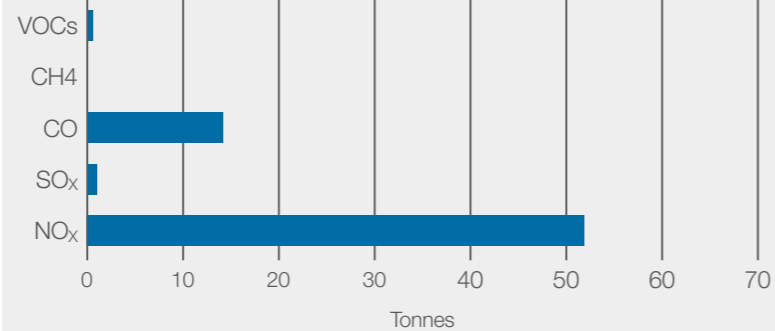
### DISCHARGES TO ATMOSPHERE

Power generation is the only source of atmospheric emissions on ISP, emitting 2902.5 tonnes of CO<sub>2</sub>.

Diesel



#### EMISSIONS BY SOURCE



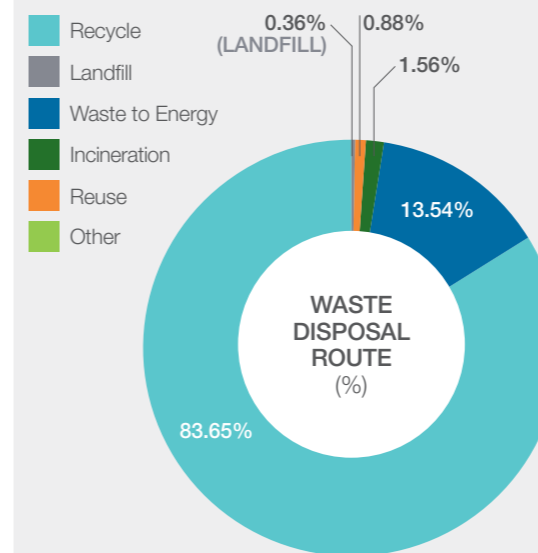
	NO <sub>x</sub>	SO <sub>x</sub>	CO	CH <sub>4</sub>	VOCs
Vent	0	0	0	0	0
Fuel Gas	0	0	0	0	0
Diesel	53.877	1.8116	14.24	0.1633	1.814
Flare	0	0	0	0	0

There are three hydrochlorofluorocarbon (HCFC) refrigerant compounds in use and two non HCFC refrigerant gases. The inventory and emission details are monitored and reported.

Compound	On Facility (kg)	Emitted (kg)	CO <sub>2</sub> Equivalent Factor (kg)	CO <sub>2</sub> Equivalent (t)
HFC-134a	10	0	1430	0
HFC-404a	45	2	3922	27
HFC-422d	74	5	2729	222
HC-600a (Isobutane)	0.03	0	3	0
R717 (Ammonia)	0.25	0	0	0
TOTAL	129.25	7	-	249

### WASTE MANAGEMENT

79.47 tonnes of waste was managed onshore. The disposal routes are charted below:



### REPORTS AND NOTIFICATION

During 2018 there were no releases of chemicals reported. There was one unpermitted discharge of oil reported and closed out through the PON 1 reporting system.

#### PON 1 Notification details

Activity	Oil/Chemical type	Discharge (t)
Port forward thruster seal	Oil	0.01





## **CONTACT**

### **Petrofac**

Engineering & Production Services  
Bridge View, 1 North Esplanade West,  
Aberdeen, AB11 5QF, UK

**T:** +44 1224 247 109

**E:** [petrofac.environment@petrofac.com](mailto:petrofac.environment@petrofac.com)

**[www.petrofac.com](http://www.petrofac.com)**