Premier Oil UK
2016 ENVIRONMENTAL STATEMENT

HEALTH, SAFETY
& ENVIRONMENT.
WE'RE ALL RESPONSIBLE.
NO SHORT CUTS. NO EXCEPTIONS. NO INCIDENTS.

PremierOil

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ABBREVIATIONS

Bbl/d	Barrels of Oil per Day
DBEIS	Department of Business Enterprise & Industrial Strategy
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DECC	Department of Energy & Climate Change
ECE	Environmentally Critical Equipment
EU ETS	European Union Emissions Trading Scheme
FPS	Forties Pipeline System
FPSO	Floating Production Storage and Offloading Vessel
FPV	Floating Production Vessel
HSES	Health, Safety, Environment and Security
ISO	International Standards Organisation
IOGP	International Association of Oil and Gas Producers
mg/l	Milligrams per Litre
NCN	Non Compliance Notice
NCR	Non Conformance Report
NO_X	Nitrous Oxides
OCNS	Offshore Chemical Notification Scheme
OCR	Offshore Chemicals Regulations
ODP	Oil Discharge Permit
OHSAS	Occupational Health and Safety Assessment Series
OPEPs	Offshore Pollution Emergency Plans
OPPC	Oil Pollution Prevention and Control
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning

OIW	Oil in Water
OSD	Offshore Safety Directive
PDN	Permitted Discharge Notification
PLO	Poses Little or No Risk
PON	Petroleum Operations Notice
PPC	Pollution, Prevention and Control
ROV	Remotely Operated Vehicle
RQ	Risk Quotient
SEGAL	Shell Esso Gas and Associated Liquids
SO_X	Sulphur Oxides
SOST	Subsea Oil Storage Tank
SUB	Chemicals Rated for Substitution
UKCS	United Kingdom Continental Shelf
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

Premier Oil UK consists assets owned by three different legal entities, Premier Oil UK Limited, Premier Oil E&P UK Limited and Premier Oil E&P UK EU Limited, hereafter collectively referred to as Premier UK. Premier UK is the UK subsidiary of the publicly listed oil and gas company Premier Oil plc, a leading independent exploration and production company with oil and gas interests in the North Sea, South East Asia, Pakistan, the Falkland Islands and Latin America.

Premier's North Sea position was transformed in 2009 with the acquisition of Oilexco North Sea Ltd which added a production base, including operatorship capability, and a broader development and exploration portfolio in the UK North Sea. Since then, Premier UK has discovered the Catcher Area fields, which are currently under development, brought on-stream the Huntington and Solan fields and, most recently in April 2016, acquired E.ON's UK North Sea assets.

Under Recommendation 2003/5 of the Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) requires that all companies operating in the United Kingdom Continental Shelf (UKCS) have systems and procedures in place to identify, monitor and control the environmental aspects associated with offshore activities.

Premier UK offshore operations, worldwide drilling operations, the Aberdeen office and onshore services are certified to the international environmental management system standard, ISO 14001. Recertification of the Premier UK Management System to ISO 14001 was recommended following a re-certification assessment in February 2017. Surveillance visits are undertaken annually.

This report provides information on Premier UK's 2016 offshore operations and the environmental performance of these operations. For the purpose of this report, these include all production and drilling activities undertaken by or on behalf of Premier UK in the UKCS. Therefore, whilst overviews of the Catcher and Tolmount projects are provided, only drilling data for Catcher is included as no production from the field took place in 2016 and Tolmount is in the early stages of development. This report also includes information about the assets secured as part of the E.ON acquisition in 2016. Although the assets were under the operation of E.ON for the first half of the year, environmental data for the full year has been presented. Although year-on-year

comparisons provided are factual, in some cases these do not represent like-for-like comparisons. This is due to different operational modes on installations, start-up dates and changes in regulatory reporting requirements.

This report is available via the Premier Oil website at;

http://www.premier-oil.com/premieroil/corporate-responsibility/environment-new

2.0 OVERVIEW OF OPERATIONS

2.1 Production Operations

(a) Babbage

The Babbage field produces gas and condensate from five development wells that have been drilled into the Babbage reservoir, with the most recent 2 wells being drilled in 2013.

The Babbage gas is exported via a 28 km pipeline tied-back to a subsea tee at the West Sole Bravo (WSB) platform (Figure 2.1). The reservoir fluids pass into the West Sole System where they commingle with other fluids before being routed to the Dimlington Terminal for further processing. The Babbage gas is a dry gas and initially produced water was not expected throughout the field life. However, water production began in 2010 with produced water discharges to sea commencing in 2013.

The Babbage platform is designed with minimum facilities with processing limited to gas separation, hydrate inhibitor storage and injection. No processing of the gas will occur at WSB, with combined gas reception and compression occurring at the Dimlington Terminal.

In 2017 the platform changed to be operated as a Not Permanently Attended Installation (NPAI) where it will be manned for 1 week in every four.

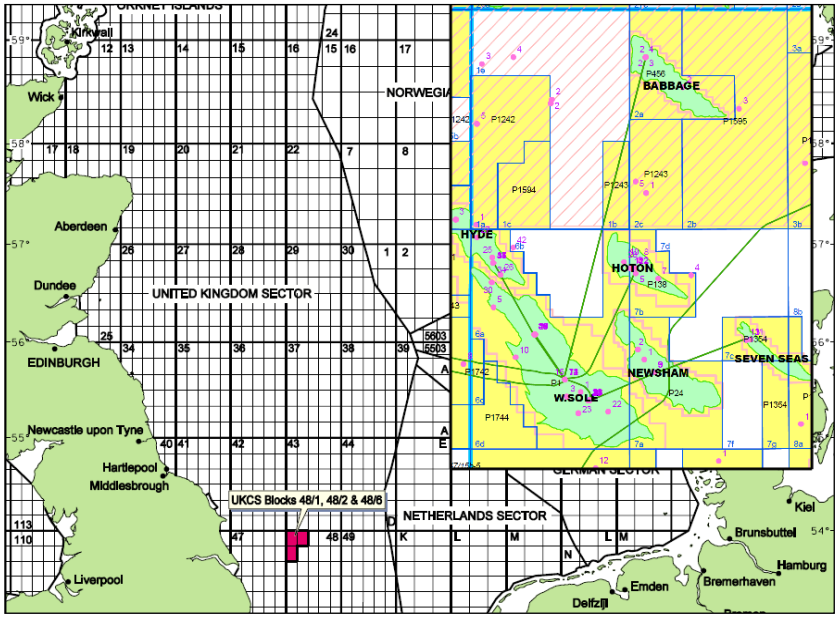

Figure 2.1 – Babbage Field System

(b) Balmoral Floating Production Vessel

The Balmoral Floating Production Vessel (FPV) (Figure 2.2) is located in Block 16/21a in the Central North Sea, approximately 125 miles north-east of the Aberdeen and 20 miles west of the UK/Norway trans-boundary line in a water depth of approximately 147m (Figure 2.3).

Figure 2.2 – Balmoral FPV

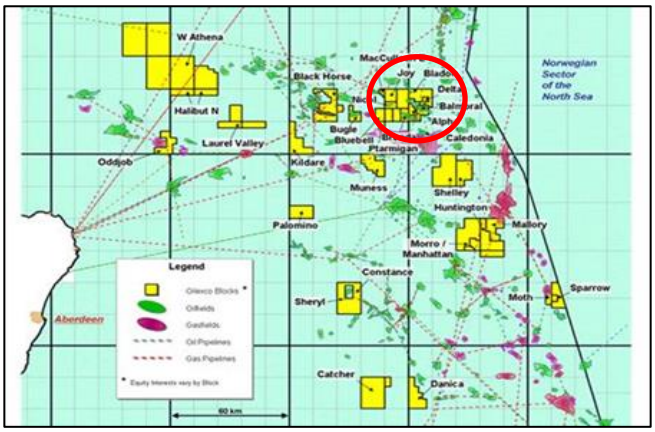

Figure 2.3 – Balmoral FPV Location

First oil was produced from Balmoral in 1986. In 2009, Premier acquired operatorship of the installation as part of the acquisition of Oilexco North Sea Limited in 2009.

Balmoral processes fluids from the Balmoral, Stirling, Brenda, Nicol, Burghley and Beauly fields, with the crude oil transported to shore via the BP operated Forties Pipeline System (FPS) to the Kinneil reception terminal on the Firth of Forth. Produced gas is used for power generation and gas lift, with excess gas flared from the installation. The water phase is treated to meet the regulatory standard for Oil in Water (OIW) and is then discharged overboard under an Oil Discharge Permit (ODP) issued by OPRED.

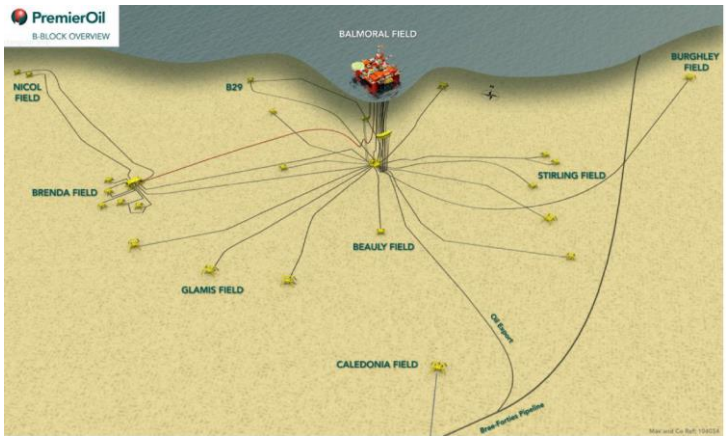

Figure 2.4 – Balmoral Field Schematic

(c) Solan

The Solan platform (Figure 2.5) is a single steel jacket structure located West of Shetland in Block 205/26a of the UKCS, 60 miles from the Scottish coast and 35 miles from the UK/Faroes median line in a water depth of approximately 138m (Figure 2.6).

The facility is designed to process fluids from two production wells supported by two water injector wells. It is capable of producing a peak flowrate of 28,000 Barrels of Oil per Day (bbl/d) with separated crude accumulating in a Subsea Oil Storage Tank prior to offloading to a tanker. Produced gas is used for power generation with excess gas flared from the installation. Produced and ballast water is treated and injected to maintain reservoir pressure.

During spring of 2016, Premier commenced production from the Solan field.

Figure 2.5 – Solan Installation

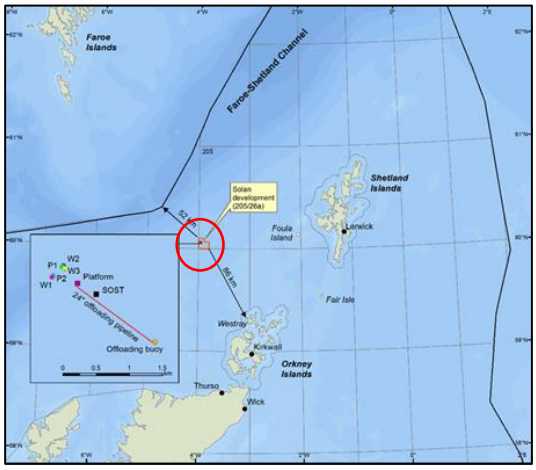

Figure 2.6 – Solan Location

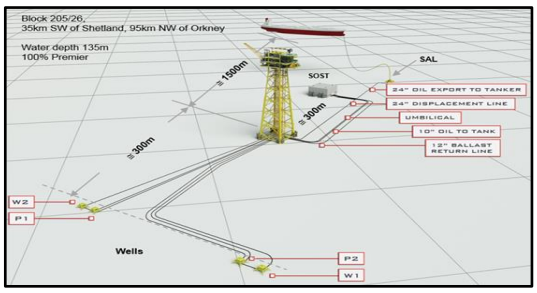

Figure 2.7 – Solan Field Schematic

Figure 2.8 – Solan Oil Storage Tank

(d) Voyageur Spirit (Huntington Field)

The Voyageur Spirit Floating, Production, Storage and Offloading vessel (FPSO) is the host installation for the Huntington Field. The FPSO lies in approximately 89 m of water and is located in UKCS Block 22/14 of the central North Sea (Figure 2.9), approximately 204 km from the Scottish coast and 27 km from the UK/Norwegian median line. The field layout is provided schematically in Figure 2.10.

The FPSO is located approximately 1.9 km to the north of the Huntington drilling template, and moored by a pattern of 13 anchors with flexible risers from the seabed entering the turret via “J” tubes.

Fluids from the Huntington field are produced back to the Voyageur Spirit via a single flexible production flowline. The development consists of 4 production wells and two water injection wells (22/14b-H1, 22/14b-H2, 22/14b-H3, 22/14b-H4, 22/14b-H5 and 22/14b-H6) which were drilled during 2011/2012. The crude oil is exported via a dynamically positioned shuttle tanker and gas is exported via the Central Area Transmission System (CATS) pipeline.

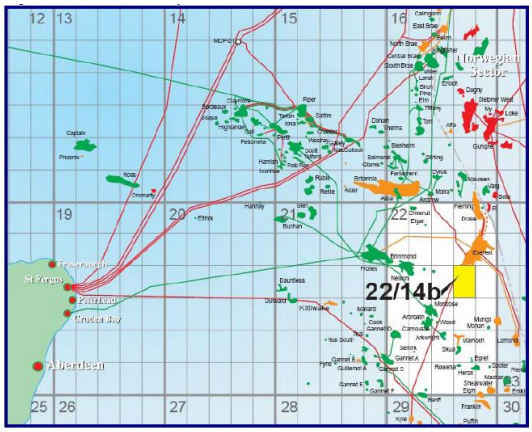

Figure 2.9 – Location of the Huntington field

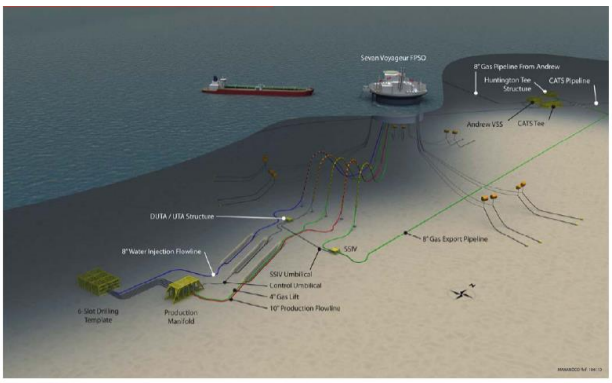

Figure 2.10 – Schematic layout of the Huntington field

2.2 Projects

(a) Balmoral Later Life Project

The Balmoral Late Life Project (BLLP) was kicked off in late 2015 to prepare for decommissioning of the Balmoral FPV, subsea infrastructure and wells associated with the Balmoral, Glamis, Stirling, Brenda and Nicol fields.

The Balmoral decommissioning programme will be executed in three distinct phases;

- Phase 1 – Removal of the Balmoral FPV and associated risers and mid-water arches and disconnection of the FPV moorings.
- Phase 2 – Decommissioning of subsea infrastructure.
- Phase 3 – Plug and abandonment of wells.

Work completed so far includes historic data gathering, pre-decommissioning pipeline / habitat and environmental baseline surveys.

(b) Catcher

Located in Blocks 28/9a and 28/10c of the UK North Sea, the Catcher Area Development Project is focused on three fields (Catcher, Burgman and Varadero), collectively referred to as the Catcher Area Development. Figure 2.12 illustrates the location of the Catcher Area Development - approximately 125 miles south east of Aberdeen and in a water depth of approximately 90 m.

Figure 2.11 – Catcher FPSO in construction

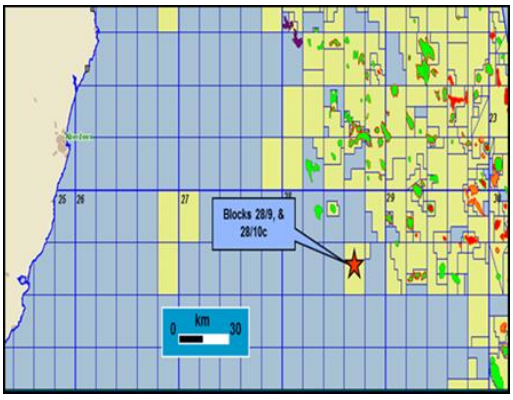

Figure 2.12 – Catcher Field Location

The facility is designed to produce a peak flowrate of 60,000 Barrels of Oil per Day (bbl/d). The three reservoirs will each be tied back to a single centrally located

Floating Production Storage and Offloading (FPSO) processing and export facility which is currently under construction.

Separated crude will be held in the vessels cargo tanks prior to being offloaded to a tanker. When offloading cargo, tank blanketing will normally use LP fuel gas, with this gas being recovered via the flare gas recovery package. Initially, produced gas will be used for power generation and gas lift, with excess being exported into the Shell Esso Gas and Associated Liquids (SEGAL) system.

In normal operations, Catcher flaring will be restricted to HP flare purge gas only. The LP flare system includes a Vapour Recovery Package to recover purges and vents sent to the LP flare system. The LP flare will be lit, as required, in process upset or ESD conditions only. Produced water will be treated and then either re-injected or discharged under an ODP issued by BEIS.

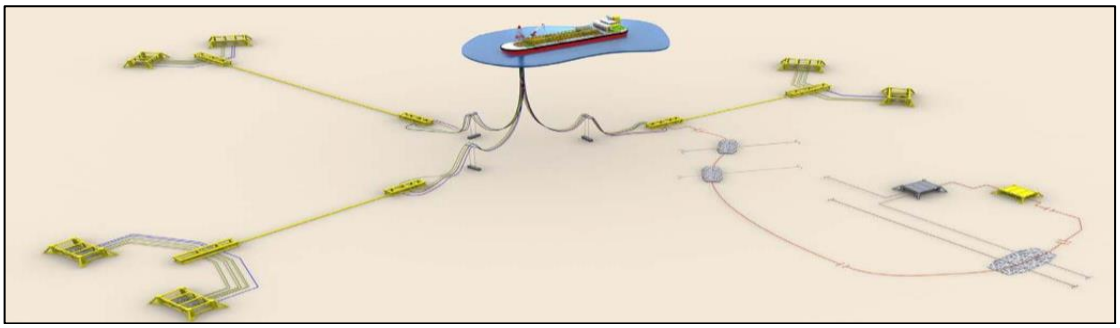

Figure 2.13 – Catcher Development Schematic

During 2016, Premier Oil continued offshore works in support of the Catcher Area Development Project, including:

- Installation of drilling templates
- Tow-in and installation of subsea bundles (containing production, umbilical, gas lift, injection water)
- Installation of Mid-Water Arches and production, gas lift and water injection risers and umbilicals
- Tie in of production spools and control lines
- Continued drilling of eight development wells

In December 2016, Premier UK's appointment of BW Offshore Catcher UK Limited as the BW Catcher FPSO Installation Operator was accepted by the UK Government. First oil is expected in 2017.

(c) Tolmount

The Tolmount Field is located in the Southern North Sea (SNS), Block 42/28d, approximately 36km east of Flamborough Head and 156km from the UK/Netherlands median line.

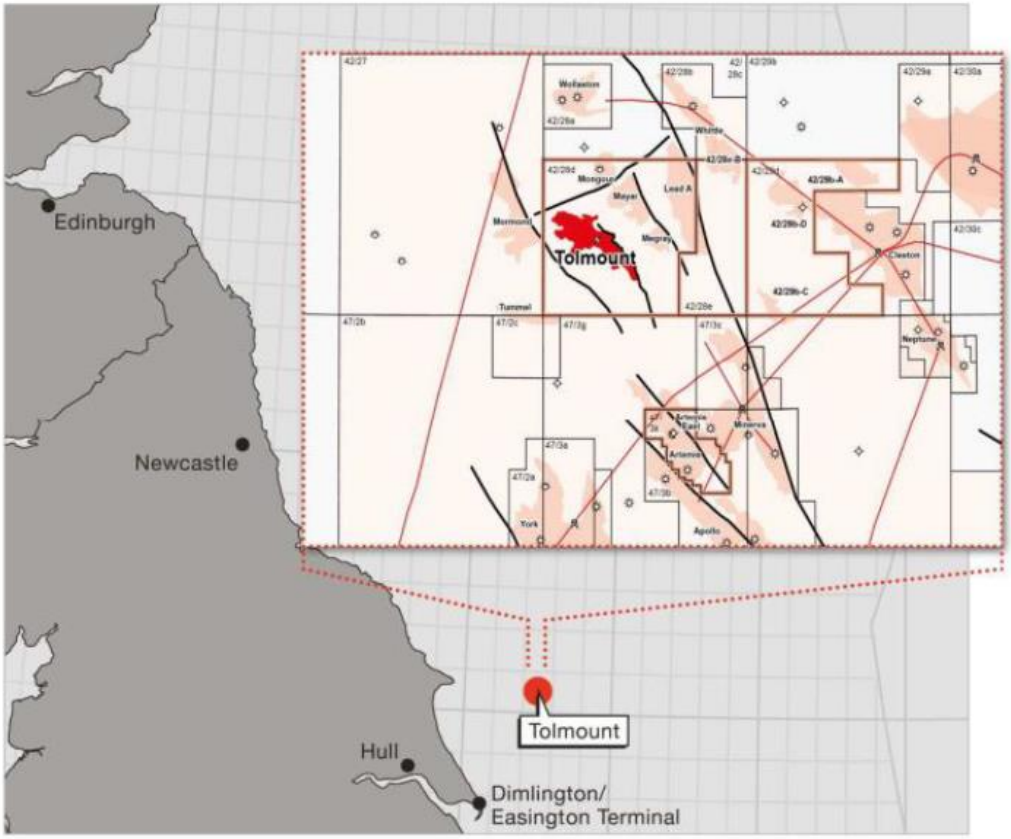

Figure 2.14 – Tolmount Field Location

Following successful well tests proving viable reserves of gas, Premier UK plans to develop the Tolmount Field in conjunction with its 50% equity partner, Dana Petroleum.

Gas is expected to be produced from four offshore production wells. This gas will be routed via a minimum facilities platform prior to export via a new 20" export pipeline to new reception facilities within the existing Perenco-owned Dimlington Gas Terminal.

During 2016 the Tolmount project completed the concept selection process. First gas is currently expected in Q4 2020

2.3 Drilling Operations

(a) Catcher Drilling

Drilling operations in the Catcher Field commenced during 2015 using the Ensco 100 jack-up drilling rig. Two wells were drilled and completed successfully in 2015, whereas in 2016, one Exploration well and six Production wells were drilled and completed.

Figure 2.15 – Ensco 100 Drilling Rig

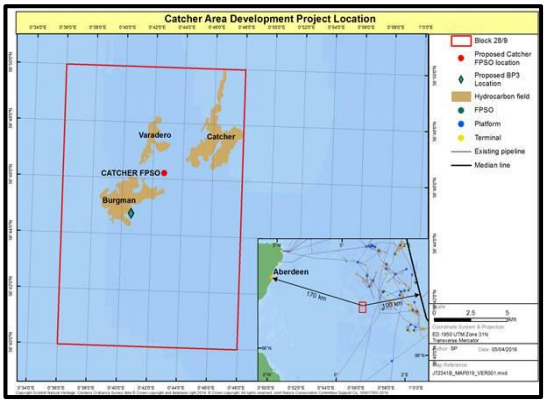

Figure 2.16 – Location of Catcher wells

(b) Solan Drilling

During 2016, drilling operations continued on the Solan 2nd producer (P2) and water injection (W2) wells. This work was undertaken by the Ocean Valiant semi-submersible drilling rig.

Figure 2.17 – Ocean Valiant Drilling Rig

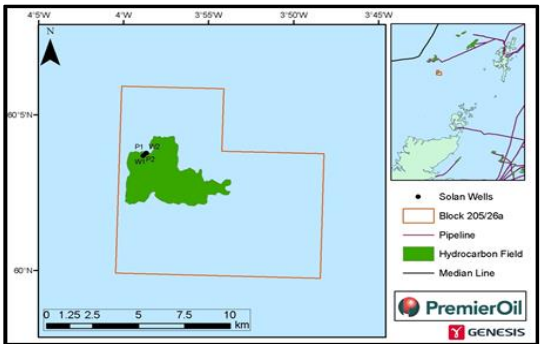

Figure 2.18 – Location of Solan wells

The W2 well was re-entered following suspension in 2013 and was subsequently completed in 2016. The P2 well was also re-entered and successfully completed in 2016.

(c) Other Drilling Operations

Solan drilling was completed in July 2016 after which the Ocean Valiant Drilling Rig moved location to carry out appraisal drilling operations on Bagpuss Well (13/25a). The well was successfully drilled and then permanently abandoned in accordance with the latest revision of Oil and Gas UK guidelines.

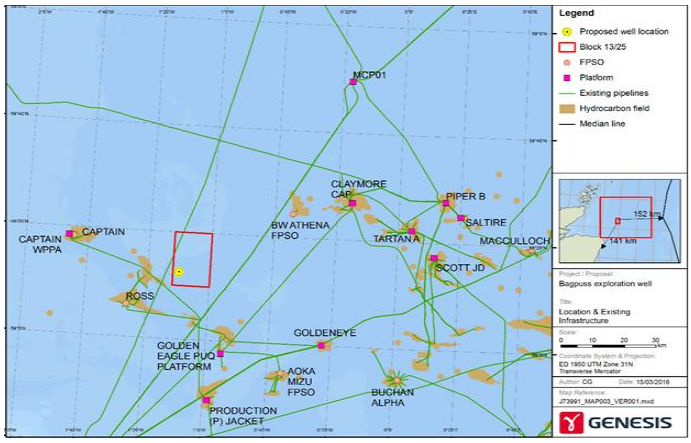

Figure 2.19 – Location of Bagpuss well

(d) Balmoral DSV Campaign and Well Intervention

In Q2 2016 a Dive Support Vessel (DSV) campaign was carried out by Seven Falcon vessel to prepare for abandonment of the A3 Balmoral sidetrack well. DSV operations included flushing and disconnection of the gas lift and production pipelines to the A3 well.

Well intervention operations were conducted at the A3 sidetrack well in Q3 2016 by a Light Weight Intervention Vessel, the Well Enhancer in order to make the well safe, secure the leak path and prepare the well for future abandonment. The operations also helped to gather information on the physical status of the well, including pressure and temperature characteristics, and condition of the tubings.

3.0 HSES MANAGEMENT SYSTEM

Premier is focused on protecting the environment in line with our stated commitment to reduce our impact to a level that is as low as reasonably practicable. This involves ongoing assessment, monitoring and reporting on environmental impacts of all our operations.

The Premier Oil Health, Safety, Environment and Security Management System (HSES-MS) exists to provide a systematic approach to the management of HSES issues in order to protect people and the environment and comply with UK legislation.

Premier considers that health, safety, environment and security have equal status with other primary business objectives and are of strategic importance to Premier. Safe working practices and due consideration of environmental impact are vital to the overall efficiency and continued success of the business. The HSES policy forms the basis for the HSES-MS and is presented below.

PremierOil

HEALTH, SAFETY, ENVIRONMENT AND SECURITY POLICY

Premier Oil is committed to operating responsibly and will never knowingly compromise our health, safety or environmental standards to meet our operational objectives. We will do all that is reasonably practicable to prevent major accidents, ensure the safety of everyone involved with our operations and minimise environmental impacts.

To achieve this we will:

- *Encourage open and honest communication*
- *Seek ways to continually improve our performance*
- *Assess and manage risks*
- *Provide appropriate resources*
- *Maintain clean, safe and healthy workplaces*
- *Investigate and learn from any incidents*
- *Plan and prepare for potential emergencies*
- *Maintain high quality documented systems and processes*
- *Seek external certification of key management systems*
- *Meet or surpass statutory requirements*

It is the responsibility of everybody involved in Premier to comply with our policies and to assist the Company in their implementation.

Tony Durrant
Chief Executive Officer, Premier Oil plc
October 2015

Figure 3.1 – Premier HSES Policy

The HSES-MS has a hierarchical document structure as illustrated in Figure 3.2. It is based on the industry model prepared by the International Association of Oil and Gas Producers (IOGP) and embraces the principles of quality management as found in the ISO 14001 and Occupational Health and Safety Assessment Series (OHSAS) 18001 international standards.

Figure 3.2 shows the structure of the HSES-MS, which is comprised of;

- Premier's HSES Policy;
- The Premier Corporate Expectations. These are owned by the CEO and issued by the Group HSES manager. The corporate expectations apply to all Premier Business Units;
- The tools to allow for implementation of the Corporate Expectations e.g. Business Unit and Asset Specific procedures.

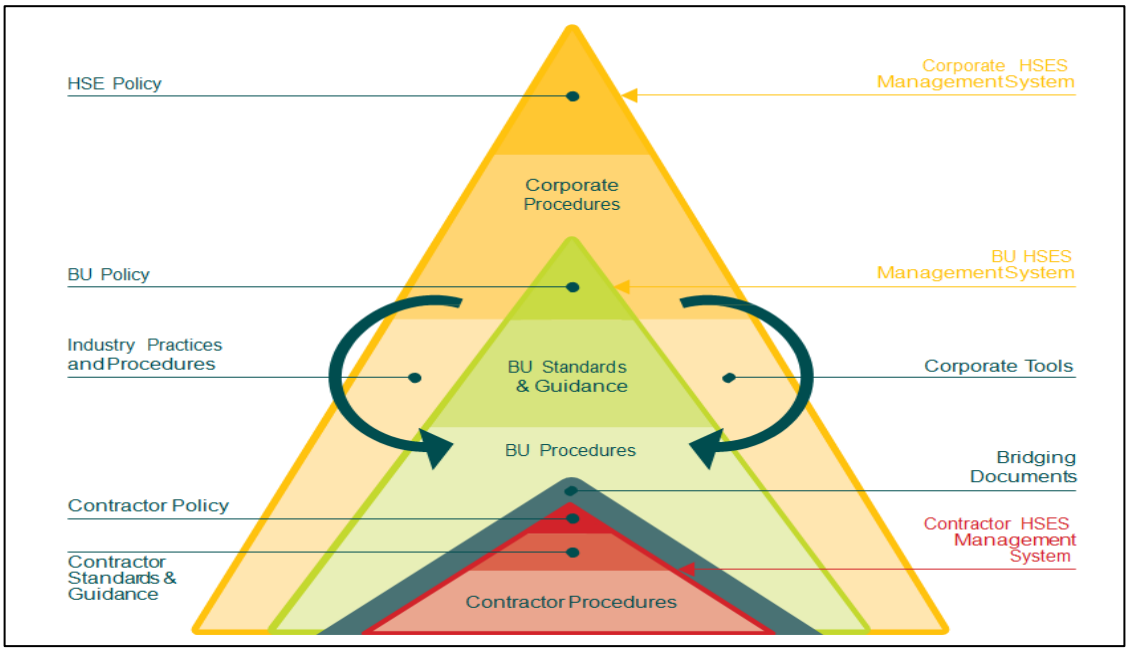

Figure 3.2 – HSES-MS Structure

The Premier HSES Management System has 10 individual Elements. Each Element contains a set of concise expectations that are mandatory for implementation and maintenance within all the constituent parts of the Premier Oil group of companies (the Group). They define 'what' is expected by the Group in order to manage HSES risk during execution of work activities.

Figure 3.3 below shows the ten elements that make up the Premier Oil HSES Management System.

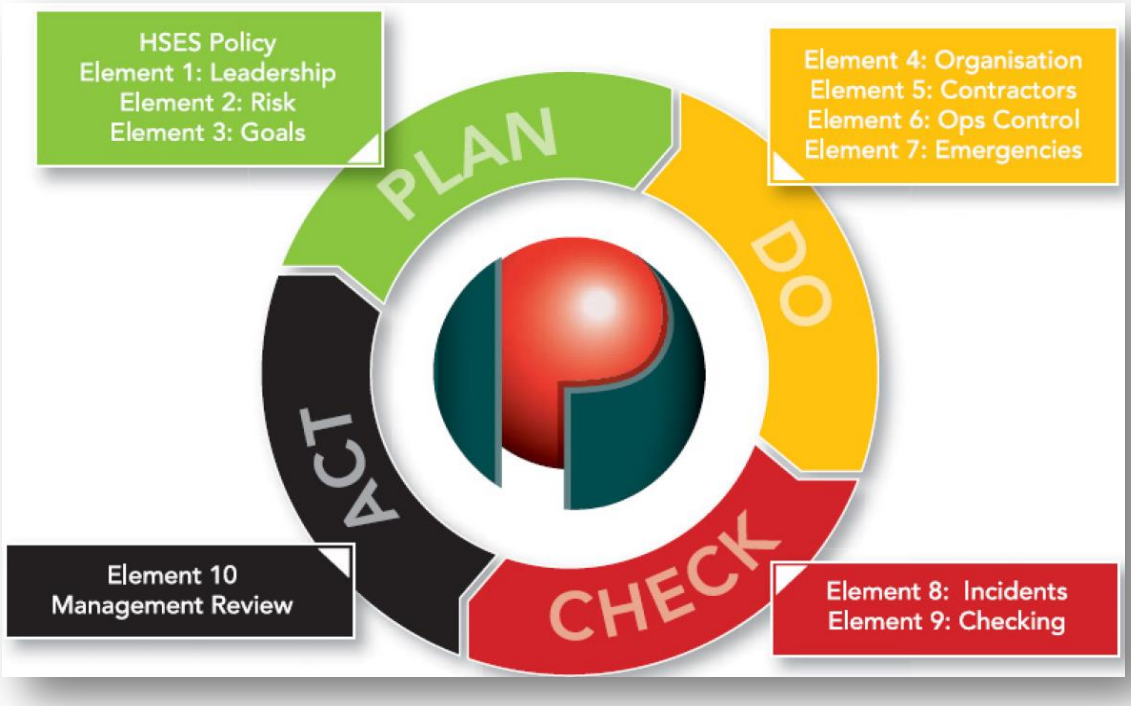

Figure 3.3 – HSES-MS Framework

4.0 ENVIRONMENTAL PERFORMANCE

Environmental performance for all operating assets is detailed below. Comparison against 2014 & 2015 data has been made where like-for-like comparisons are feasible due to consistent and comparable operations being undertaken at the respective site.

4.1 Oil in Produced Water

During normal production, water is produced when extracting hydrocarbons from the reservoir.

Despite treatment, produced water still contains traces of oil, and as such, produced water discharge is controlled via a permitting system managed by the UK regulatory authority, OPRED.

The 2016 Oil Discharge Permits held by Premier UK allow the installations to discharge produced water and ballast water, provided the hydrocarbon concentration is within the limit set out in the permit.

(a) Babbage

The Babbage installation discharges Produced Water (PW) through a PW treatment package when fluids cannot be exported to Dimlington Terminal. The PW treatment package comprises a degassing vessel, polishing unit (filtration unit) and discharge caisson [and a hydrocyclone unit which is currently not used].

Figure 4.1 shows the cumulative produced water discharges from Babbage during 2016. The total volume of produced water discharged to sea from the Babbage platform was 667.39 m^3 against the permitted volume of 63,663.6m^3. This equates to a discharge of 1% of the Babbage permit produced water volume limit.

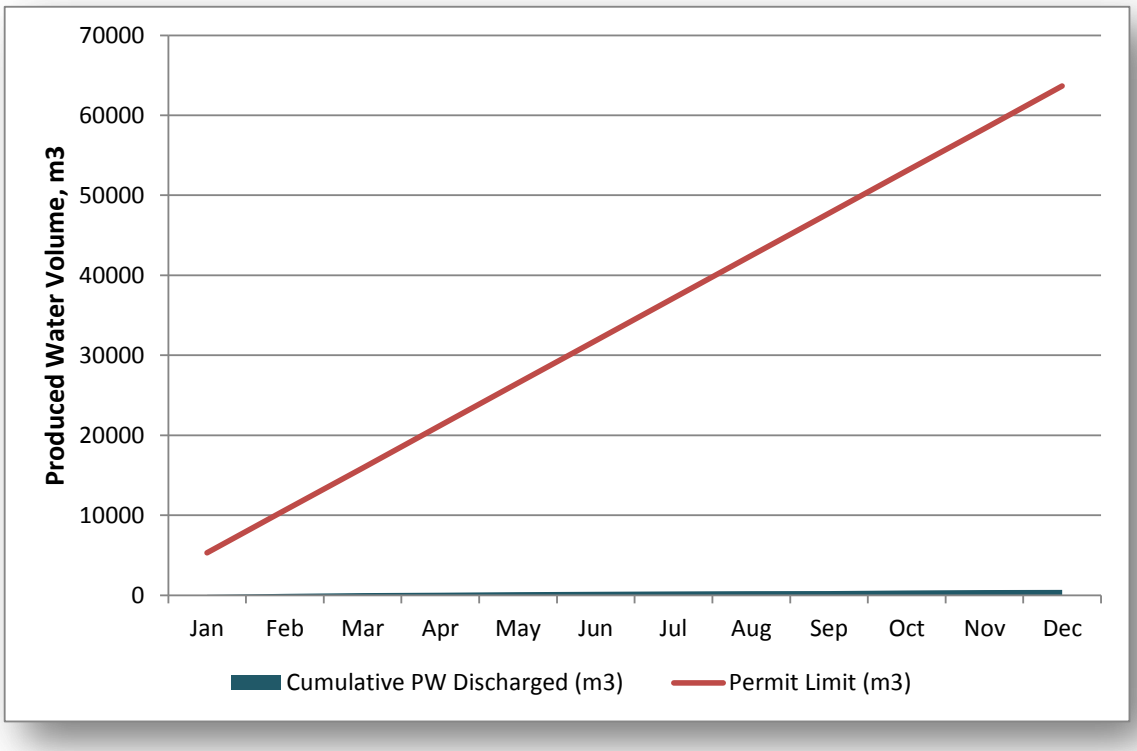

Figure 4.1 – Cumulative Produced Water Discharge from Babbage in 2016

Figure 4.2 shows the total mass of oil in produced water discharged to sea from Babbage in 2016 was 0.007 tonnes.

The average concentration of oil discharged in produced water for Babbage in 2016 was 9.58 mg/l. This compares favourably with the regulatory permitted monthly average of 30 mg/l.

This continued good performance is down to the optimised management of the produced water treatment equipment. As mentioned previously, the base case is to send all produced fluids back to the Dimlington Terminal.

Figure 4.3 presents the rolling monthly average oil in water concentration for Babbage in 2016.

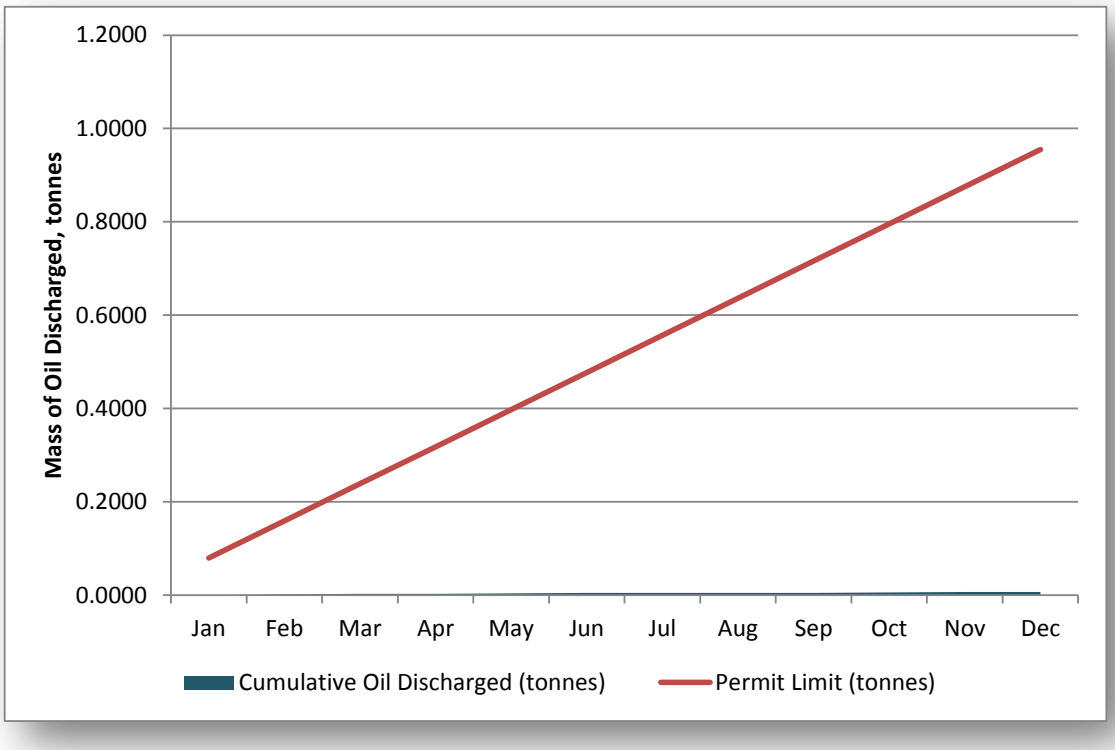

Figure 4.2 – Mass of Oil Discharged in Produced Water from Babbage in 2016

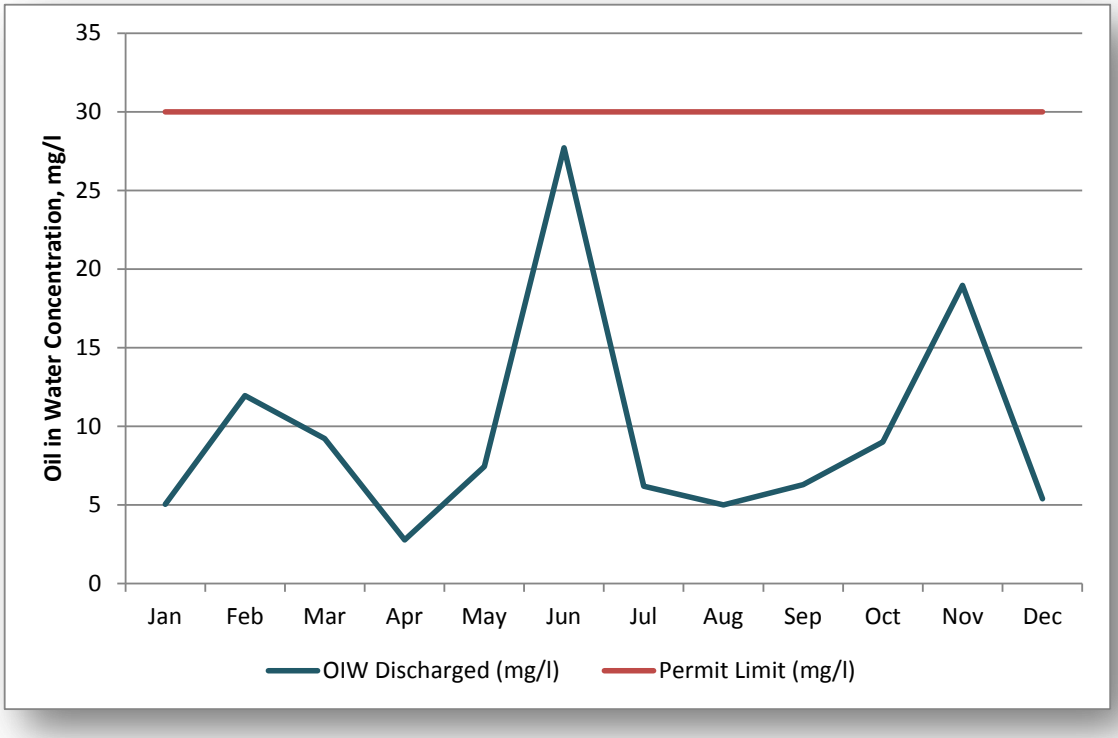

Figure 4.3 – Average Oil in Water Concentration for Babbage in 2016

(b) Balmoral

The Balmoral FPV discharges produced water overboard via a dedicated caisson after the water has been separated and then routed though hydro-cyclones and the tilted plate separator to remove entrained oil.

Figure 4.4 shows the cumulative produced water discharges from Balmoral FPV during 2016. The total volume of produced water discharged to sea from the Balmoral FPV was 2,261,808.39m^3 against the permitted volume of 3,563,803m^3.

This equates to a discharge of 63.5% of the Balmoral FPV permit produced water volume limit and is a decrease in the total amount discharged as compared with 2015 (2,639,730m^3). Produced water volumes expected to increase every year (due to the fact that as wells mature, the percentage of water cut from the reservoir fluids naturally increases). However, in 2016 the number of shut-downs (planned and unplanned) and extended production restrictions, resulted in less produced water/oil in produced water discharged into the sea.

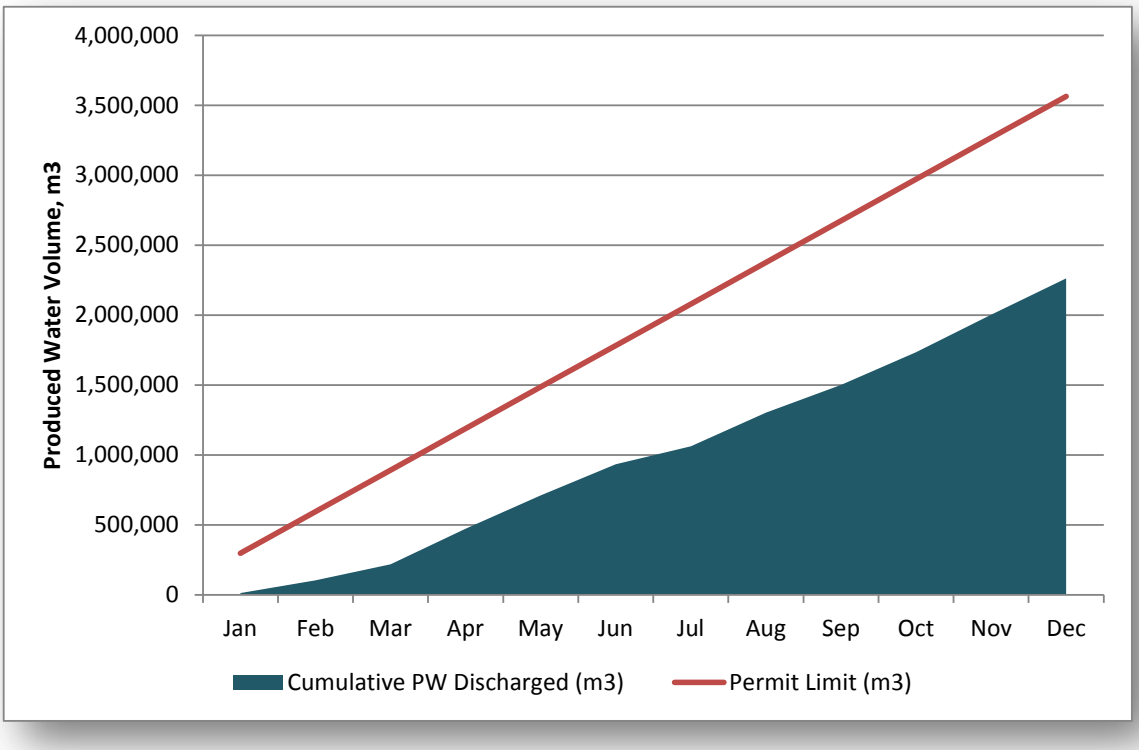

Figure 4.4 – Cumulative Produced Water Discharge from Balmoral in 2016

Figure 4.5 shows the total mass of oil in produced water discharged to sea from the Balmoral FPV in 2016 was 19.006 tonnes. This is about 11% less than the 21.336

tonnes discharged in 2015. This is due to the number of shut-downs (planned and unplanned) and extended production restrictions in 2016, which resulted in less produced water/oil in produced water discharged into the sea.

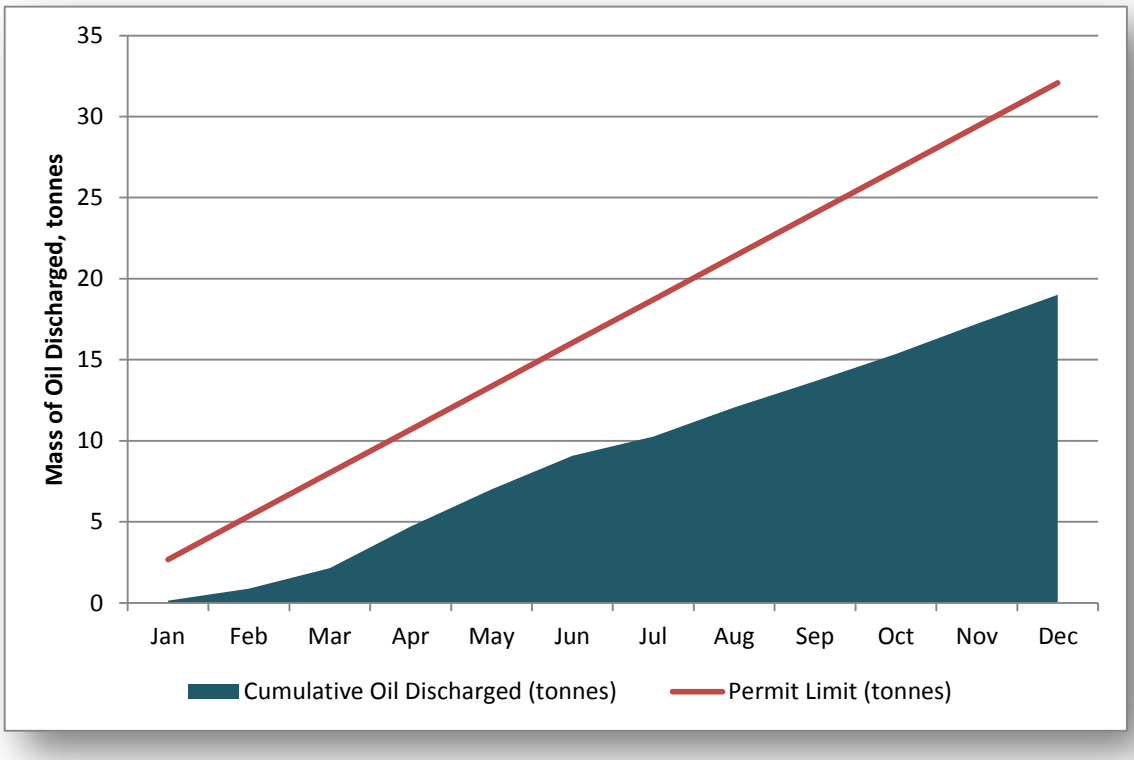

Figure 4.5 – Mass of Oil Discharged in Produced Water from Balmoral in 2016

The average concentration of oil discharged in produced water for Balmoral in 2016 was 8.4 mg/l. Monthly average oil in water concentrations provided in Figure 4.10. which demonstrates monthly average were less than legally permitted monthly average of 30 mg/l.

Whilst the 2016 average is 3% higher than in 2015, it is still significantly below the permitted monthly average.

This continued good performance is down to the optimised management of the produced water treatment equipment and the highly efficient chemicals used to remove oil from the produced water before discharge.

Techniques used on Balmoral towards both lowering the concentration of oil in produced water and reducing the amount of oil passed to sea continue to be particularly effective.

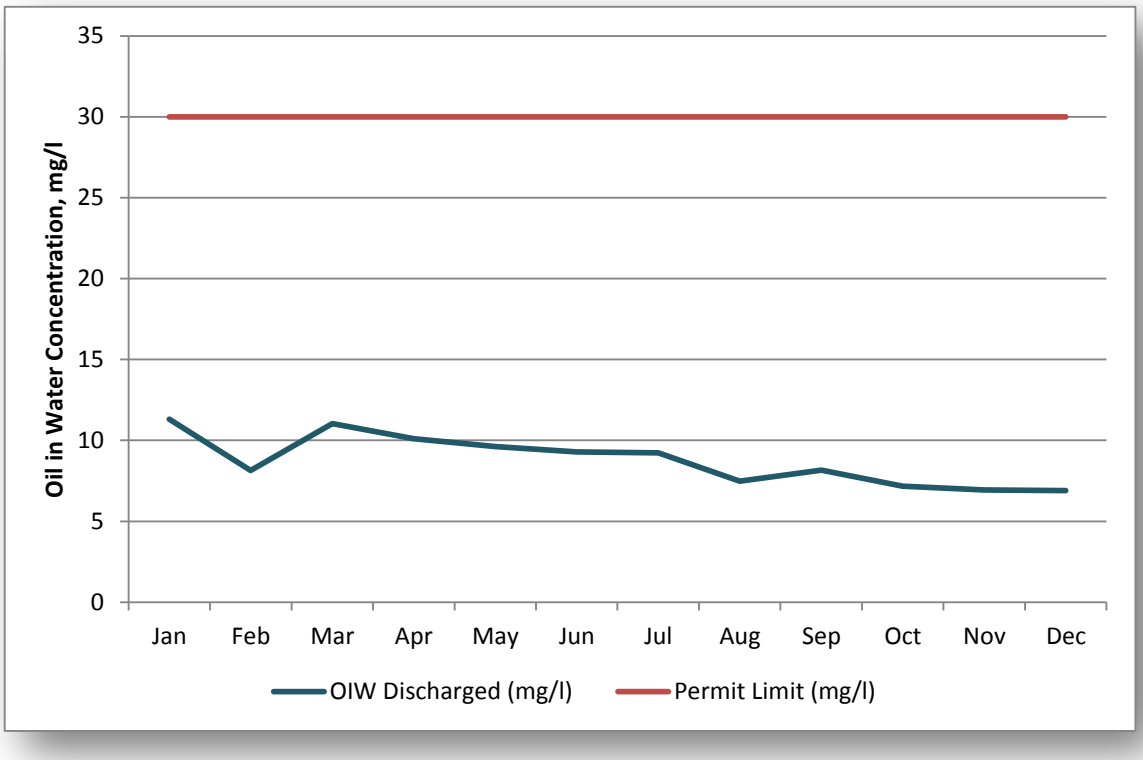

Figure 4.6 – Average Oil in Water Concentration for Balmoral in 2016

(c) Solan

Produced water has not yet broken through the Solan reservoir and therefore it is ballast water from oil displacement within the Subsea Oil Storage tank (SOST) which is discharge or injected once treated through the dedicated ballast water filters.

The Solan Platform has two options for disposal of ballast water; over board via a dedicated disposal caisson or re-injected into the reservoir via two dedicated water injection wells, W1 and W2. The ballast water is treated through a bank of cartridge filters capable of removing up to 99% of free oil from water prior to disposal overboard or downhole. Solan had no produced water breakthrough in 2016.

Ballast water with small concentrations of hydrocarbons are injected by preference or discharged overboard once treated through dedicated ballast water absorption filters. A total of 200,095m^3 of ballast water was discharged from the platform in 2016 against a permitted volume of 216,345m^3.

Figure 4.7 shows the volume of ballast water discharged since April 2016 start-up of the Solan field.

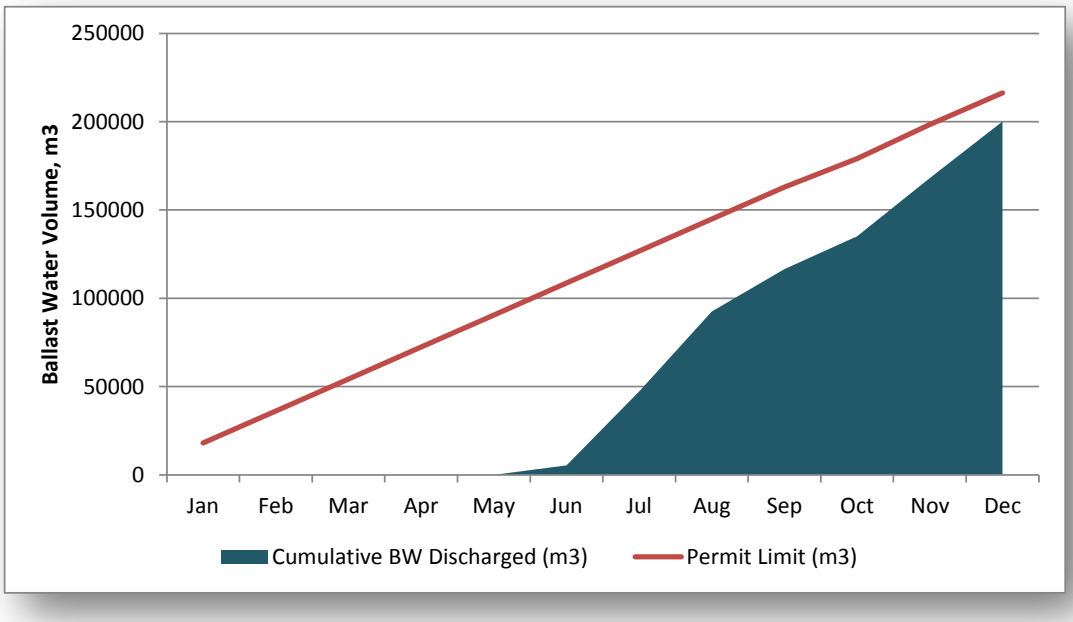

Figure 4.7 – Cumulative Ballast Water Discharge from Solan in 2016

Solan was permitted to discharge a total of 2.2tonnes of hydrocarbon in 2016 equating to an average of 10mg/l oil in water concentration. The platform discharged a total of 0.0008tonnes of hydrocarbon (Figure 4.8) with an average concentration of 0.049mg/l (Figure 4.9) within the ballast water due to good interface management within the SOST and treatment through the ballast water filtration package.

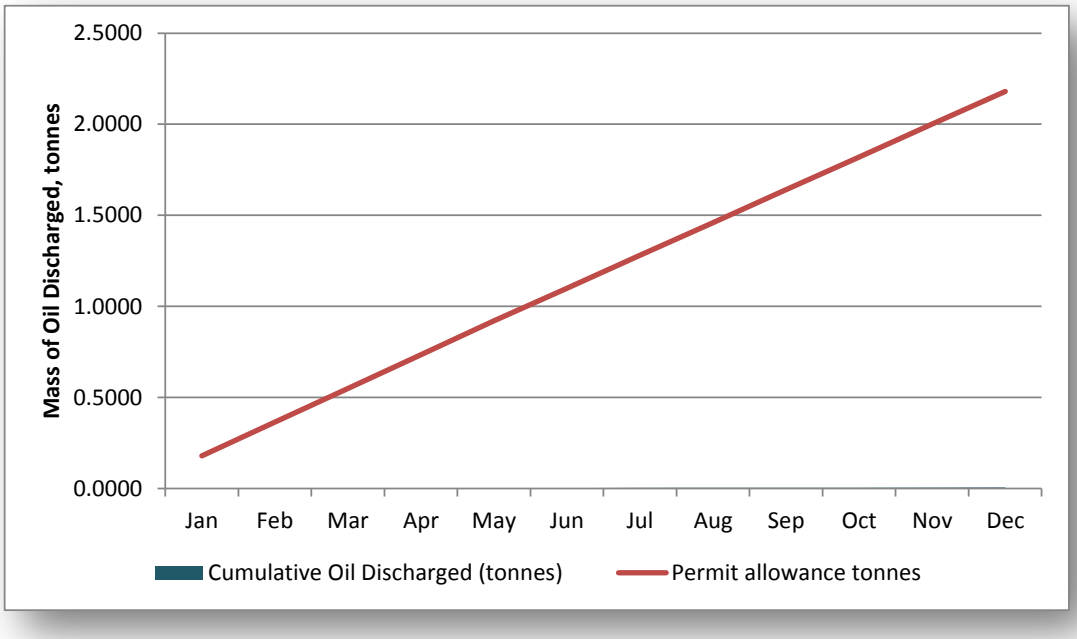

Figure 4.8 – Mass of Oil Discharged in Ballast Water from Solan in 2016

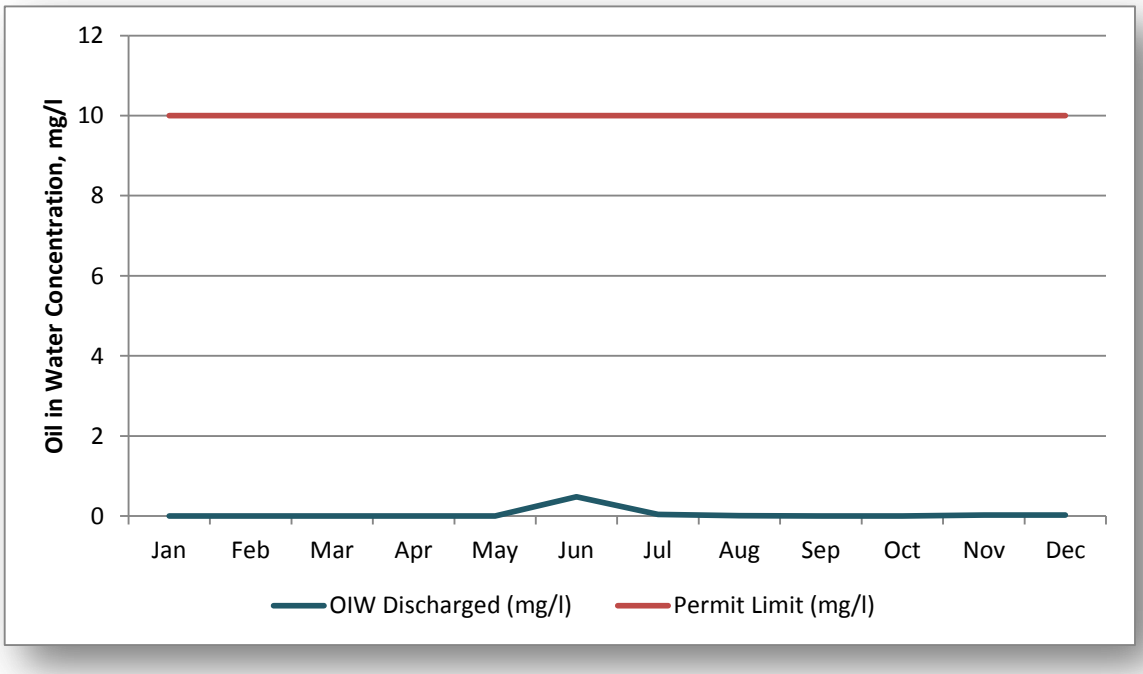

Figure 4.9 – Average Oil in Water Concentration for Solan in 2016

(d) Voyageur Spirit (Huntington Field)

Produced water can be treated in up to four stages on the Voyageur Spirit FPSO before release either via overboard discharge, or to slop tanks, using the following equipment to treat PW:

- 1st and 2nd stage separator
- Hydrocyclone
- Degassing Vessel (inducing gas flotation for coalescing of the oil droplets)
- Filters (Produced Water Filters, Backwashing Filters, Fine Filters).

Figure 4.10 shows the cumulative produced water discharges from the Voyageur Spirit FPSO during 2016. The total volume of produced water discharged to sea from the Voyageur Spirit FPSO was 36,846.72 m^3 against the permitted volume of 146,929.19 m^3. This equates to a discharge of 25 % of the Voyageur Spirit FPSO permit produced water volume limit.

Figure 4.11 shows the total mass of oil in produced water discharged to sea from the Voyageur Spirit in 2016 was 0.247 tonnes.

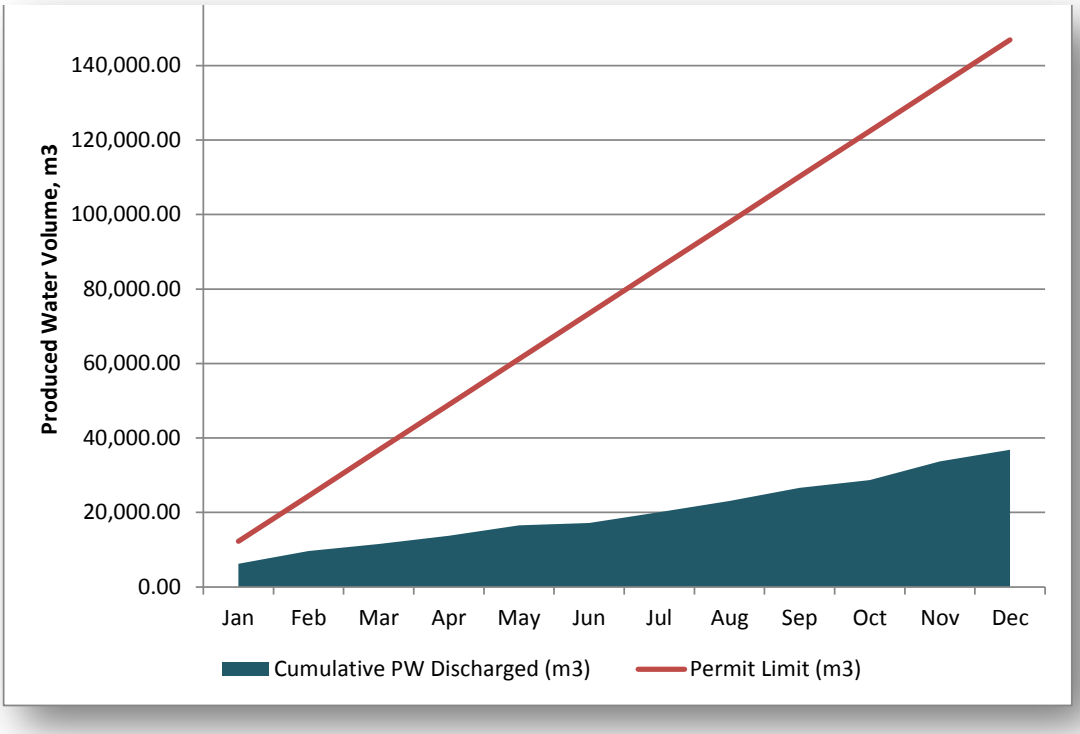

Figure 4.10 – Cumulative Produced Water Discharge from Voyageur Spirit in 2016

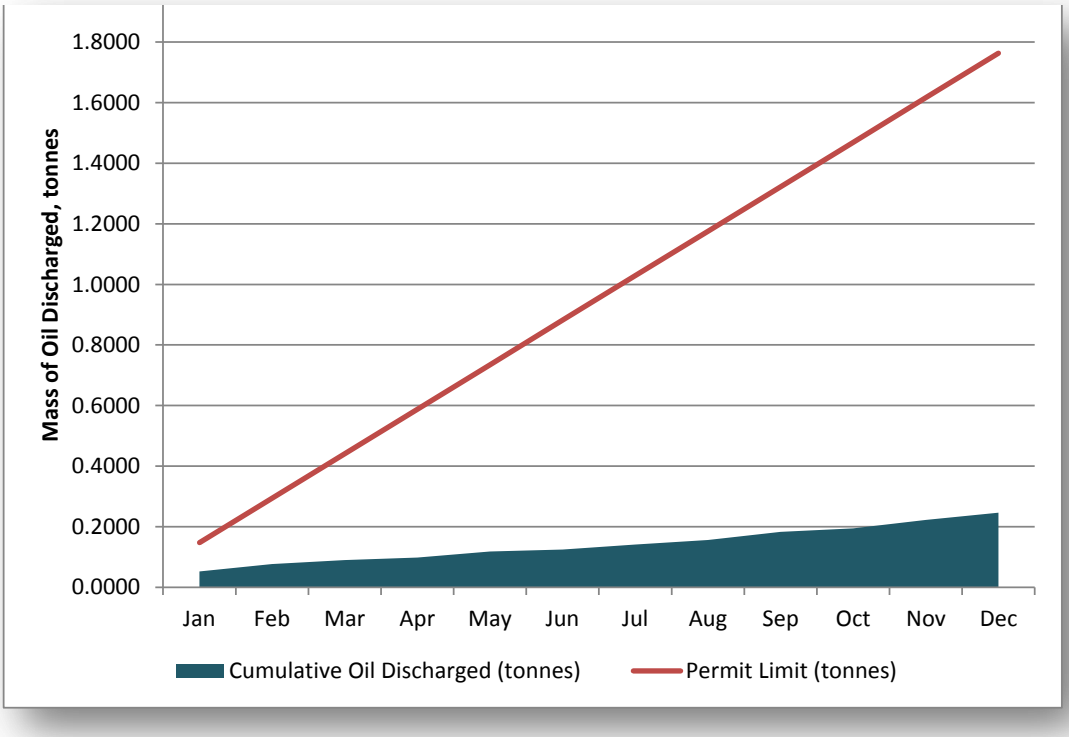

Figure 4.11 – Total Tonnage of Oil Discharged in Produced Water

The average concentration of oil discharged in produced water for the Voyageur Spirit FPSO in 2016 was 6.72 mg/l. This compares favourably with the regulatory permitted monthly average of 30 mg/l. Figure 4.12 presents the rolling monthly average oil in water concentration for the Voyageur Spirit FPSO in 2016.

This continued good performance is down to the optimised management of the produced water treatment equipment.

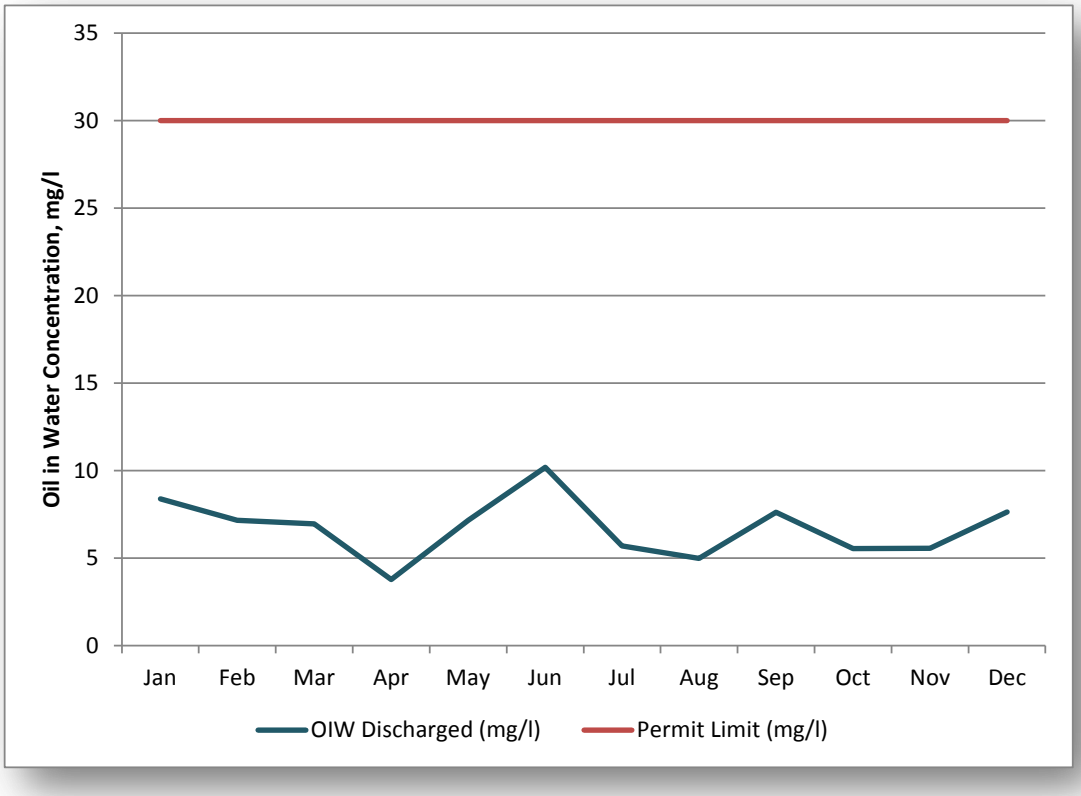

Figure 4.12 – Average Oil in Water Concentration for Voyageur Spirit in 2016

4.2 Chemical Use and Discharge

Various chemicals are used offshore in drilling and production operations.

During production operations, chemicals such as scale dissolvers, corrosion inhibitors, demulsifiers and biocides are used to assist with the separation of oil and water, prevent damage to infrastructure such as pipelines, and to prevent 'souring' of the reservoir.

In drilling operations these chemicals include fluids known as 'drilling muds', which lubricate and cool the drilling bit, maintain downhole pressure and bring the drill cuttings to the surface.

Any chemical used offshore must, in line with the Offshore Chemical Regulations 2002, first be approved by the Centre for Environment, Fisheries and Aquatic Sciences (CEFAS). The chemicals are subject to robust environmental risk assessment and once approved, their use is controlled and monitored through a permit granted by OPRED.

Under the Offshore Chemical Notification Scheme (OCNS), chemicals are ranked according to the assessed hazard to the environment and are given a lettered heading E, D, C, B or A, with E representing the lowest and A the highest hazard category.

Using the Chemical Hazard and Risk Management (CHARM) model, a colouring band is used to show which chemicals pose the highest hazard. These bands are Gold, Silver, White, Blue, Orange or Purple with Gold representing the lowest hazard and Purple the highest.

Some chemicals are regarded as PLONOR (PLO), which means that they have been determined to pose little or no risk to the environment.

Any chemicals which have been identified as posing potential environmental risks (such as bioaccumulation or slow biodegradation) are subject to controls under which their use must first be approved by OPRED. This is backed up by a detailed justification for use of the chemical. Such chemicals carry a 'substitution warning' (SUB) which aims to encourage the phase out of the use of these chemicals.

Premier UK, its contractors and its chemical suppliers work on a continuous basis to find suitable alternatives to replace the products with SUB warnings.

(a) Babbage

One chemical with a substitution warning (SUB) was permitted for use on Babbage in 2016. This chemical was later reclassified and the SUB warning removed. The chemical is detailed in Table 4.1.

Chemical & OCNS Category	Summary of Change Out Review
Oceanic HW540 E, Hydraulic Fluid, MacDermid Offshore Solutions	This chemical was reclassified and no longer has a SUB warning.

Table 4.1 – SUB Chemicals Permitted for use in Babbage operations

In Figure 4.13, the chemicals used on Babbage during 2016 have been grouped by OCNS category. This figure shows that most of the chemicals used and discharged are rated PLO.

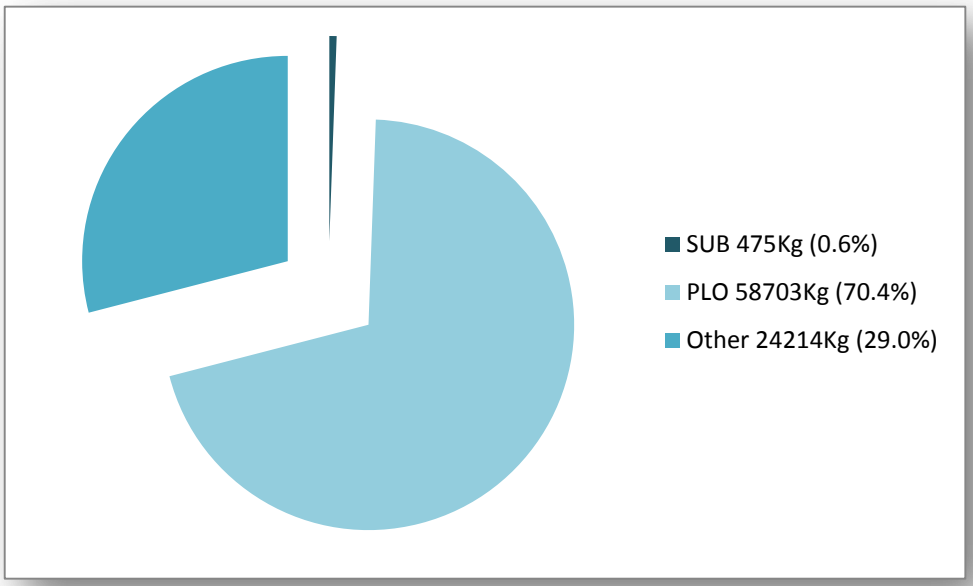

Figure 4.13 – Chemical Use and Discharge during operations, by OCNS Category

(b) Balmoral FPV

Four chemicals with substitution warnings (SUB) were permitted for use on Balmoral in 2016. These chemicals are detailed in Table 4.2. During 2016 however, SUB warning was removed from one of the chemicals (Oceanic HW443R).

Chemical & OCNS Category	Summary of Change Out Review
EC1231A, Nalco Ltd, Corrosion Inhibitor, Gold, 2016	Alternative scale inhibitor (as opposed to a combined scale/corrosion inhibitor) has been recommended. However test work would be required to confirm the product is a suitable replacement. The Balmoral asset is estimated to reach COP in 2018. The financial implications of commissioning the test work; and additional related work scopes to change out a product such as existing stock run down, bulk tank flushing and offshore trials; mean that the product may not be changed out before COP.
EC6152A, Nalco Ltd, Scale Inhibitor, Gold 2016	Alternative scale inhibitor has been recommended. However test work would be required to confirm the product is a suitable replacement. The Balmoral asset is estimated to reach COP in 2018. The financial implications of commissioning the test

Chemical & OCNS Category	Summary of Change Out Review
	work; and additional related work scopes to change out a product such as existing stock run down, bulk tank flushing and offshore trials; mean that the product may not be changed out before COP.
SCW85649, Baker Hughes Ltd, Scale Inhibitor, Gold, 2016	Alternative scale inhibitor has been recommended. However test work would be required to confirm the product is a suitable replacement. The Balmoral asset is estimated to reach COP in 2018. The financial implications of commissioning the test work; and additional related work scopes to change out a product such as existing stock run down, bulk tank flushing and offshore trials; mean that the product may not be changed out before COP.
Oceanic HW443R Hydraulic Fluid, D, 2016	SUB warning was added and then removed later in 2016

Table 4.2 – SUB Chemicals Permitted for use in Balmoral FPV operations

34,804.48 kgs of SUB chemicals were used on Balmoral in 2016. This is 48% less than SUB chemicals use in 2015. Two 2015 SUB chemicals were removed from 2016, hence reduction of volume. SUB chemicals use in 2016 was 17% of the total 204,668.49 kgs of chemicals used.

In Figure 4.14 the chemicals used on Balmoral FPV during 2016 have been grouped by OCNS category. This figure shows that 11% of all the chemicals used and discharged are rated PLO.

2,309 kgs of chemicals were used and of those 1,403 kgs discharged during DSV Operations carried out by Seven Falcon on Balmoral A3 side-track well. One of the chemicals used and discharged (42 kgs) was carrying SUB warning.

During Balmoral A3 side-track well intervention carried out by Well Enhancer in total 232,475.4 kgs of chemicals were used and 176,967 kgs (76% of total used chemicals) were discharged. Two SUB chemicals were permitted, however not used or discharged.

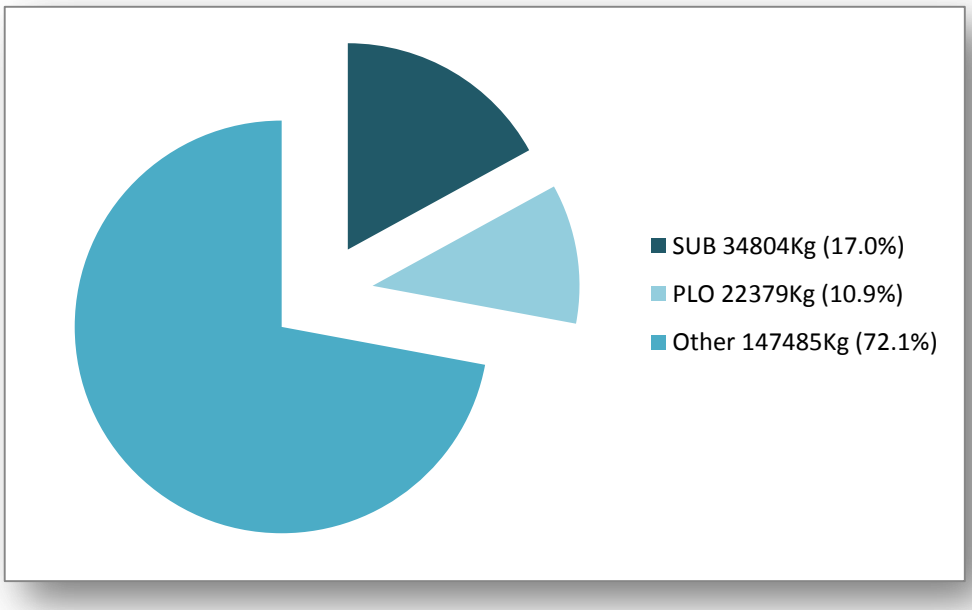

Figure 4.14 – Chemical Use and Discharge during operations, by OCNS Category

(c) Solan

A total of 9 chemicals identified for substitution were used and / or discharged from Solan in 2016. The majority were relating to chemicals contained within the SOST and flowlines from commissioning of the field. 15937.9kgs of chemical identified for substitution were discharged from Solan in 2016.

Chemical & OCNS Category	Summary of Change Out Review
RX-5720, Roemex Ltd, Corrosion Inhibitor, Silver, 2016	Only used for treatment of the fluids within the SOST during the installation and commissioning phase. No alternative product available currently to replace. No longer in use on Solan.
EC6718A, Nalco Ltd, Biocide, Gold 2016	Alternative biocides are available but not as effective for application to the SOST and able to penetrate biofilms as effectively. Manufacturer continues to research alternative greener technologies.
EC9242A, Nalco Ltd, Antifoam, Gold, 2016	Manufacturer continues to research an alternative with greener technology. This product is currently not in use and will only be used if foaming is seen in the offshore production stream.
Oceanic HW443, MacDermid PLC Hydraulic Fluid, D, 2016	Solan field started-up in Q2 2016 and it was agreed that as the subsea control fluids in place were HW443 the operations team would wait until post commissioning before looking to replace with HW443R.

Chemical & OCNS Category	Summary of Change Out Review
RO HY B238, REDA Oilfield UK ltd Biocide, Gold, 2016	Trial product only and used during commissioning of the subsea tank and flowlines. No longer on the Solan permit.
RO HY C350, REDA Oilfield UK ltd Corrosion Inhibitor, Gold, 2016	Trial product only and used during commissioning of the subsea tank and flowlines. No longer on the Solan permit.
RO HY M779, REDA Oilfield UK ltd Dye, Gold, 2016	Trial product only and used during commissioning of the subsea tank and flowlines. No longer on the Solan permit.
RO HY V658, REDA Oilfield UK ltd Oxygen Scavenger, Gold, 2016	Trial product only and used during commissioning of the subsea tank and flowlines. No longer on the Solan permit.
2,6 DFBA, Resman AS Tracer chemical, Gold, 2016	Tracer chemical used during completion of the water injection wells in 2015. Returned to the platform and discharged during 2016. There is no planned replacement for this production as by design it is required to have a low biodegradation.

Table 4.3 – SUB Chemicals Permitted for use in Solan operations

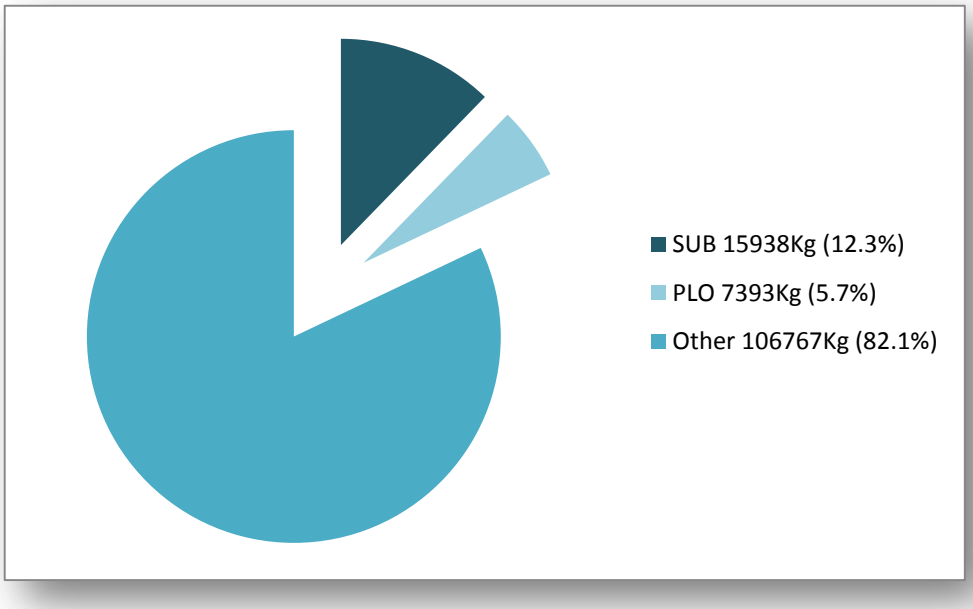

Figure 4.15 – Chemical Use and Discharge during operations, by OCNS Category

(d) Voyageur Spirit (Huntington Field)

Two chemicals with a substitution warning (SUB) were permitted for use on the Voyageur Spirit FPSO in 2016. The Oceanic HW443 R was then reclassified and the SUB warning removed. FOAMTREAT 921A was included on the permit as a contingency chemical and there was no use of it in 2016.

The chemicals are detailed in Table 4.4.

Chemical & OCNS Category	Summary of Change Out Review
Oceanic HW443 R, Hydraulic Fluid, MacDermid PLC	SUB warning was added and then removed later in 2016
FOAMTREAT 921A, Antifoam, Clariant Oil Services UK Ltd	The chemical supplier and Premier are working to replace this chemical with a SUB free alternative.

Table 4.4 – SUB Chemicals Permitted for use in Voyageur Spirit FPSO operations

In Figure 4.16 the chemicals used on the Voyageur Spirit FPSO during 2016 have been grouped by OCNS category. This figure shows that most of the chemicals used and discharged are rated Other.

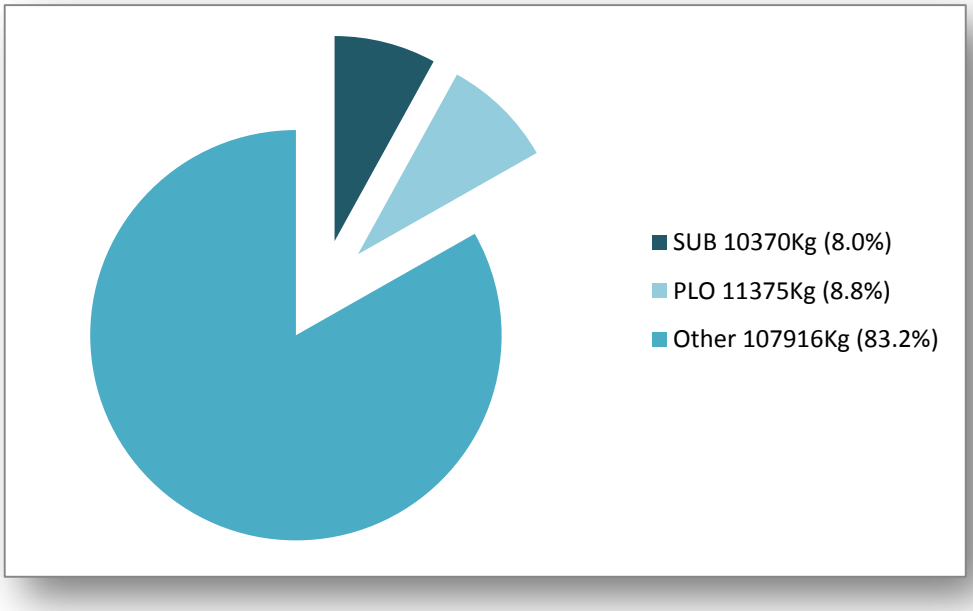

Figure 4.16 Chemical Use and Discharge during operations, by OCNS Category

(e) Catcher Drilling (Ensco 100)

A total of 35 chemicals with SUB warnings were permitted for use during Catcher drilling operations in 2016. Of the 35 chemicals, 11 have been used during operations.

The amount of SUB Chemicals used since 2015 has fallen by 31%, making up 0.22% of total chemical use. Figures 4.17 and 4.18 show the percentage of SUB and PLO chemicals used and discharged relative to other chemicals. These figures group the chemicals by OCNS category and show that 77% of all the chemicals used and 99% of those discharged are rated PLO.

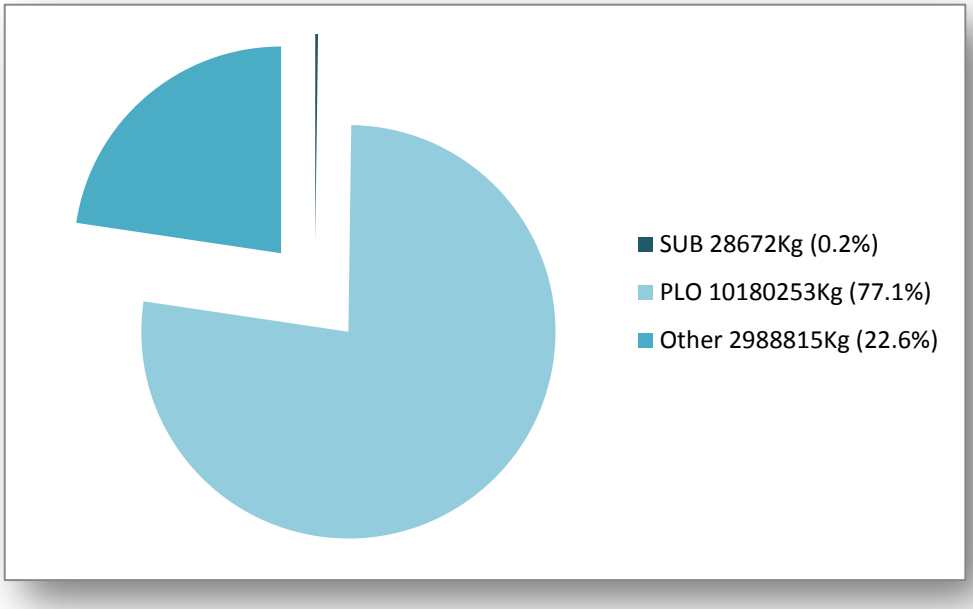

Figure 4.17 – Chemical Use during drilling operations by OCNS

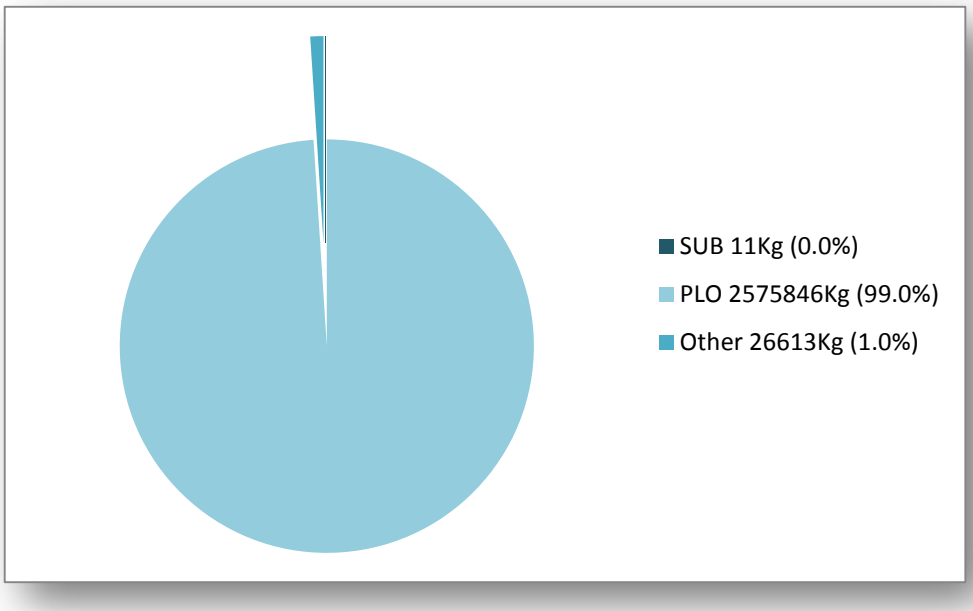

Figure 4.18 – Chemicals Discharged during drilling operations by OCNS

(f) Solan and Bagpuss Drilling (Ocean Valiant)

A total of 23 chemicals with SUB warnings were permitted for use during the Solan and Bagpuss drilling operations in 2016. Only 11 of these were actually used and two were discharged.

Four of the chemicals with a SUB warning used during Solan drilling operations were replaced with non-SUB (least harmful) products during 2016. One product's SUB warning was removed during 2016.

Figures 4.19 and 4.20 show the percentage of SUB and PLO chemicals used and discharged relative to other chemicals. These figures group the chemicals by OCNS category and show that 74% of all the chemicals used and 94% of those discharged are rated PLO.

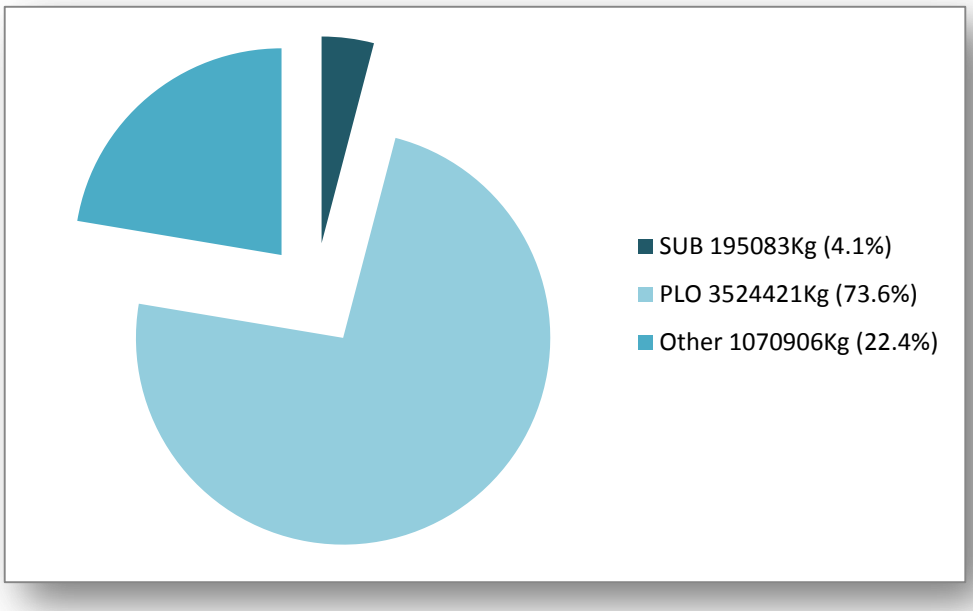

Figure 4.19 – SUB Chemical Use during Solan drilling operations

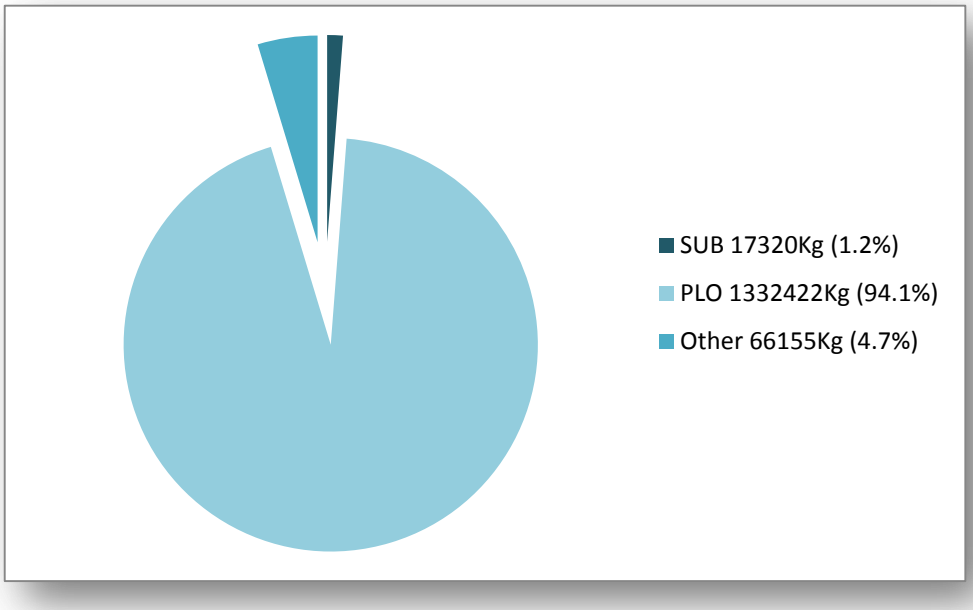

Figure 4.20 – Chemicals Discharged during drilling operations by OCNS

4.3 Waste

Waste is generated from offshore operations and is transported onshore for re-use, recycling, treatment or disposal.

On both production and drilling installations, waste is segregated into categories before back-loading. As much waste as possible is sent for recycling. This includes wood, scrap metals, paper/cardboard, glass and plastics.

Waste that cannot be recycled is sent to landfill. Certain types of waste that are harmful to the environment (Special Waste) are sent ashore to be processed and disposed of by licensed handlers in accordance with the relevant legislation.

Premier continues to target areas where the amount of waste generated can be further reduced. E-reps are actively involved in continuous awareness raising and reduction of waste initiatives.

(a) Babbage

The Babbage platform was acquired from E.On in 2016. Information has been included for the whole year. However, the first four months of the year was E.On reportable.

A total of 29.57 tonnes of waste was disposed of from the Babbage platform in 2016. Babbage recycled 12.7% of its waste during the year. The majority of non-recycled waste was sent to landfill. Figure 4.21 shows the fate of waste produced from the Babbage platform.

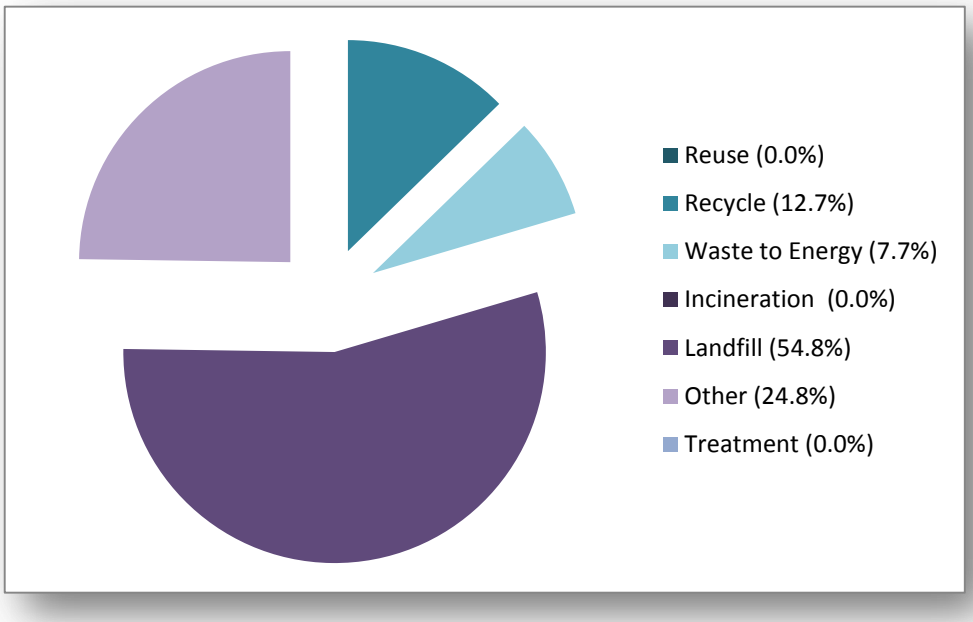

Figure 4.21 Babbage Waste Disposal Routes

(b) Balmoral

A total of 164.2 tonnes of waste was disposed of from the Balmoral FPV in 2016 compared to 165 tonnes in 2015.

Balmoral recycled 71% of its waste during the year. This is an improvement of 59% of waste recycled in 2015 primarily due to the continuous raising of awareness offshore, participation of Environmental Representatives (E-reps) and implementation of the skip audits recommendations.

Figure 4.22 shows the fate of waste produced from the Balmoral FPV in 2016.

99.45 tonnes of waste was generated during A3 Balmoral side-track well intervention campaign. 94% of that waste were liquid well returns and they were sent to the specialist third party company for treatment.

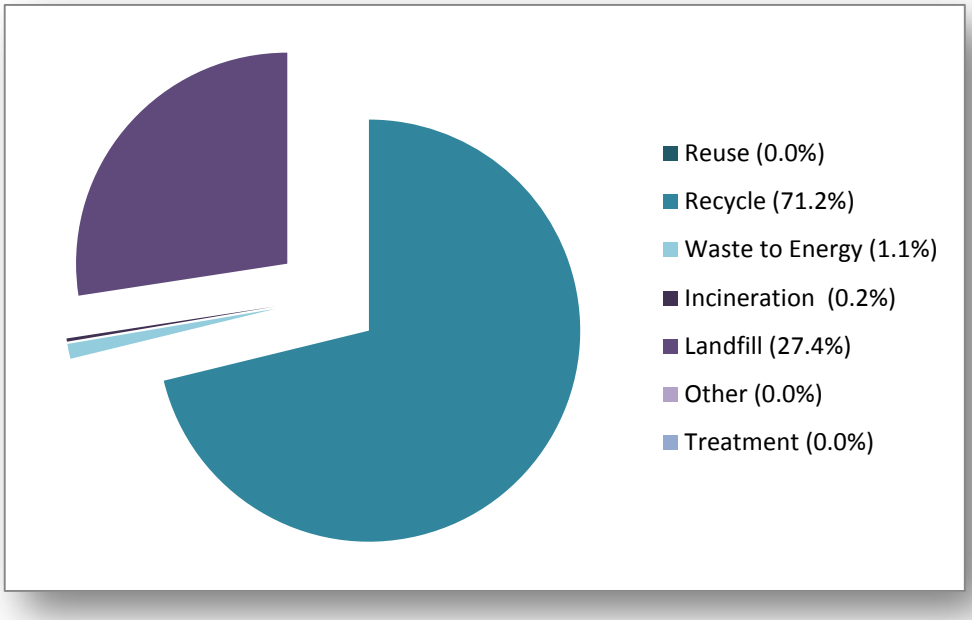

Figure 4.22 – Balmoral Waste Disposal Routes

(c) Solan

A total of 670 tonnes of waste was generated on Solan in 2016. Of this 195.3 tonnes (29%) was sent to landfill and 435.5 tonnes (65%) was recycled.

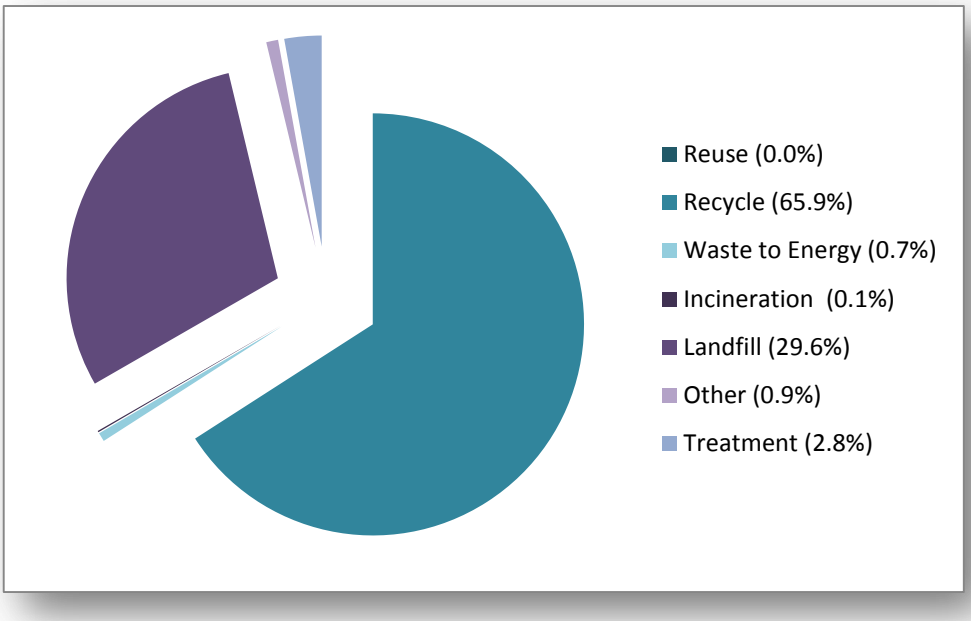

Figure 4.23 Solan waste disposal routes

(d) Voyageur Spirit (Huntington Field)

The Huntington field was acquired from E.On in 2016. Information has been included for the whole year. However, the first four months of the year was E.On reportable.

A total of 99.99 tonnes of waste was disposed of from the Voyageur Spirit FPSO in 2016. The Voyageur Spirit FPSO recycled 59% of its waste during the year. The majority of non-recycled waste was sent to landfill.

Figure 4.24 shows the fate of waste produced from the Voyageur Spirit FPSO.

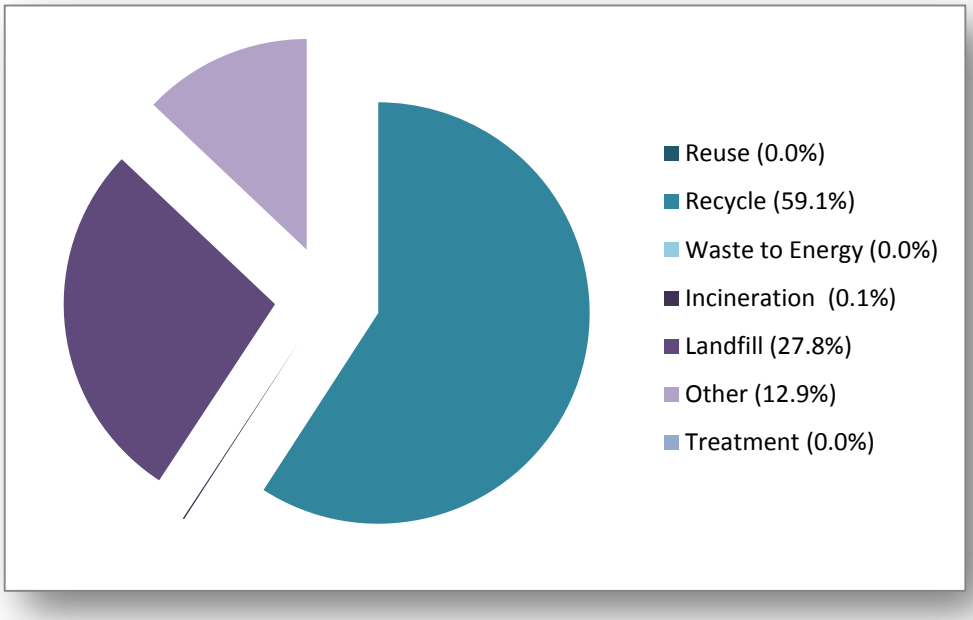

Figure 4.24 – Voyageur Spirit Waste Disposal Routes

(e) Catcher Drilling (Ensco 100)

A total of 3,591 tonnes of waste was disposed of from Catcher drilling operations in 2016. Of this figure, 2,925 tonnes (81%) was drilling waste (e.g. drill cuttings) and 666 tonnes (19%) was operational (e.g. general waste generated on the rig, scrap metal, wood etc.). 8% of the drilling waste (drill cuttings) was recycled, 75% was sent to landfill and the remaining 17% was ether treated or permitted for discharge during water phase drilling. 74% of the operational waste was recycled, 23% sent to landfill, 3% converted to energy and less than 1% incinerated.

Figure 4.25 shows the Operational Waste from the Drilling Rig used for Catcher drilling operations.

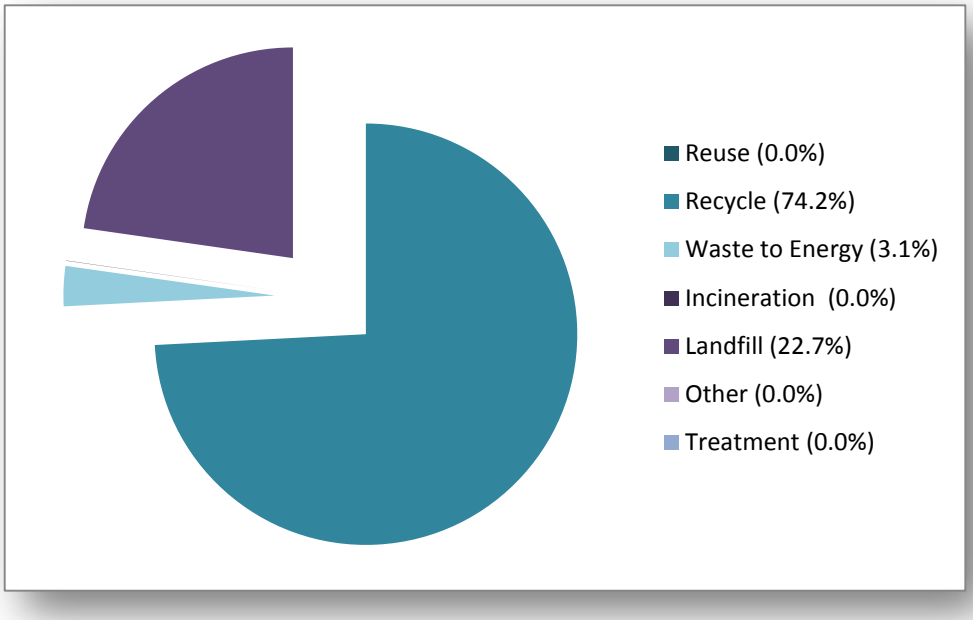

Figure 4.25 – Ensco 100 Waste Disposal Routes

(f) Solan Drilling (Ocean Valiant)

A total of 3,093.514 tonnes of waste was disposed of from Ocean Valiant MODU during Solan and Bagpuss Solan drilling operations in 2016. Of this figure, 2453.634 tonnes (80%) was drilling waste (e.g. drill cuttings) and 639.88 tonnes (20%) operational waste (e.g. general waste generated on the rig, scrap metal, wood etc.). About 18% of the drilling waste (drill cuttings) was reused and 77% was sent to landfill. 38.6% of the operational waste was recycled and 21.3% sent to landfill.

Figure 4.26 shows Operational Waste from the Drilling Rig working for Solan and Bagpuss drilling operations.

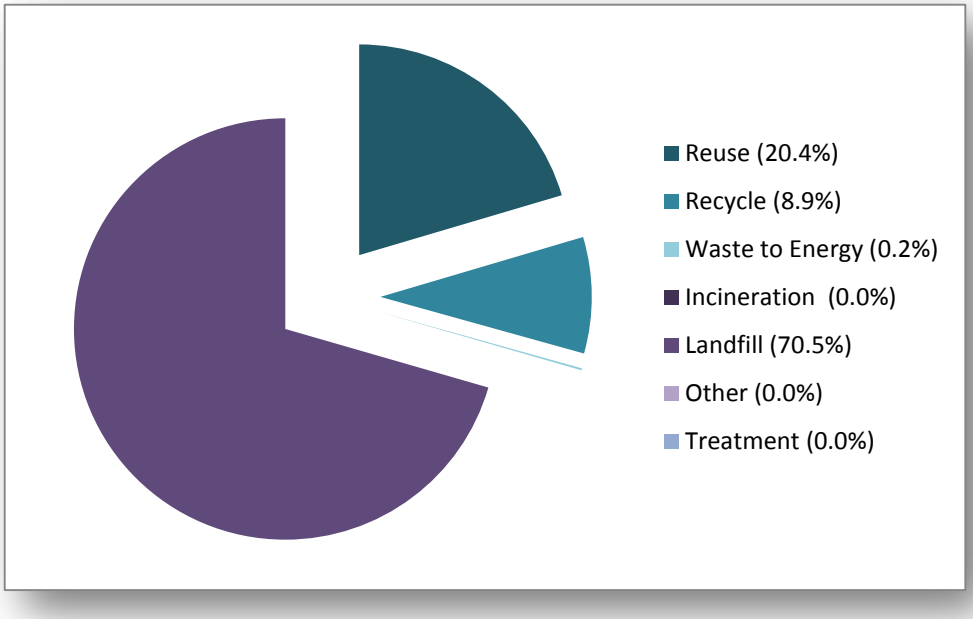

Figure 4.26 – Ocean Valiant Waste Disposal Routes

4.4 Atmospheric Emissions

Atmospheric emissions arise during offshore drilling and production operations predominantly as a result of fuel combustion for power generation and gas flaring activities.

There were some changes to reporting requirements for atmospheric emissions in 2015 (emissions factors changed). This mean that a comparison between 2014 and 2015 data is not like for like. The figures for 2016 are given in the following pages.

(a) Babbage

Babbage does not fall under the requirements of the Pollution, Prevention and Control (PPC) Regulations or the EU ETS Regulations.

(b) Balmoral

The Balmoral FPV is regulated under the Pollution, Prevention and Control (PPC) Regulations as a large combustion installation. As such, the installation has set limits on atmospheric emissions of nitrous oxides (NO_x), sulphur oxides (SO_x), carbon monoxide (CO), methane (CH_4) and volatile organic compounds (VOCs).

Figure 4.27 below shows the combustion emissions (excluding CO_2) for 2016.

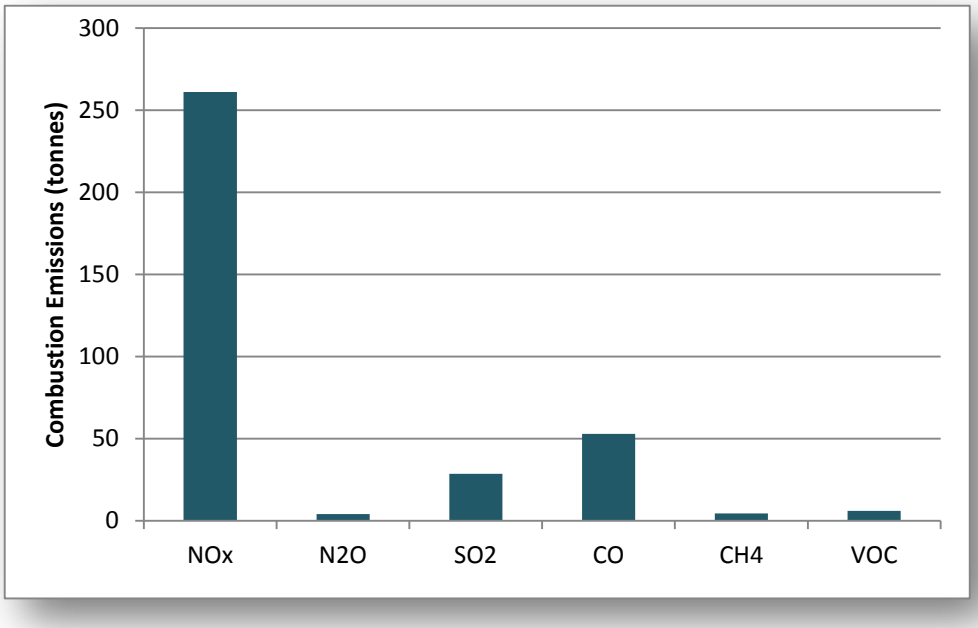

Figure 4.27 – Combustion Emissions from Balmoral in 2016

All emissions were within limits set by BEIS in the Balmoral PPC Permit.

Balmoral is also regulated under the European Union Emission Trading Scheme (EU ETS) Regulations, which regulate CO_2 emissions for combustion sources, such as turbines and flaring. Balmoral has no gas export route and as a result, produced gas is used as fuel gas or is flared from the installation.

CO_2 emissions as a result of combustion sources are presented in Figure 4.28.

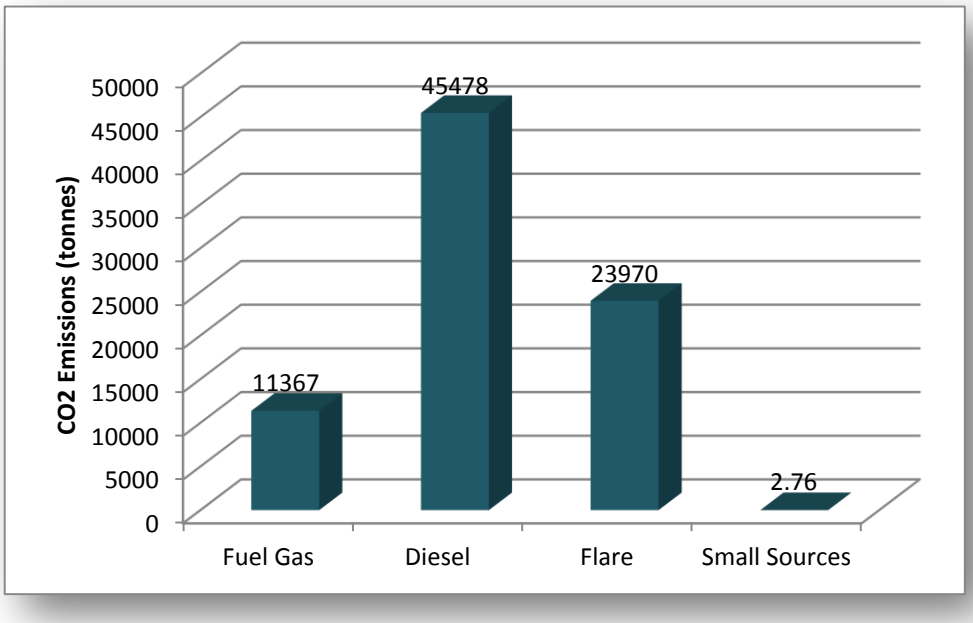

Figure 4.28 – CO_2 Emissions from Balmoral Combustion and Flaring in 2016

During 2016, 80,818 tonnes of CO_2 were emitted from combustion and flaring on Balmoral. Of these emissions, 70.3% were as a result of combustion for power generation and the remaining 29.7% resulted from the flaring of excess gas.

CO_2 emissions decreased by about 5% compared to 2015 levels - this indicates the energy efficiency initiatives implemented over the last couple of years have been maintained by Balmoral. During normal operations, Balmoral FPV runs with one turbine on fuel gas and one turbine on diesel. This reduction is also due to the increased number of shut-downs (planned and unplanned) and extended production restrictions during 2016.

(c) Solan

Solan is regulated under the European Union Emission Trading Scheme (EU ETS) Regulations, which regulate CO_2 emissions for combustion sources, such as turbines and flaring. Solan has no gas export route and as a result, produced gas is used as fuel gas or is flared from the installation. Fuel gas was not commissioned in 2016 and therefore only CO_2 emissions from diesel combustion and flare gas was reported.

A total of 37,080 tonnes of CO_2 were emitted from the Solan platform in 2016, 44% from diesel combustion and 54% from flare gas emissions.

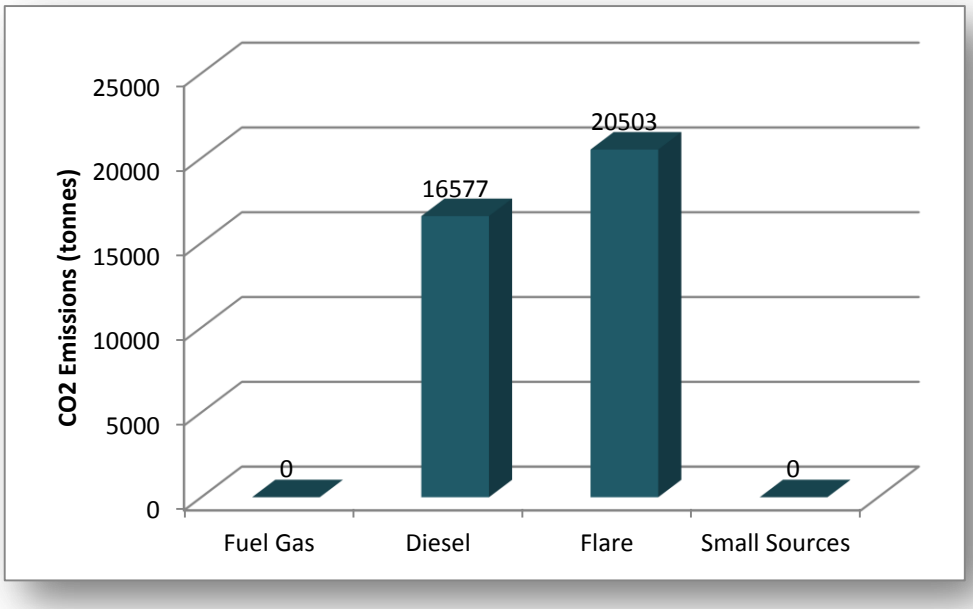

Figure 4.29 – CO2 emissions from combustion and flaring

(d) Voyageur Spirit (Huntington Field)

The Voyageur Spirit FPSO is regulated under the Pollution, Prevention and Control (PPC) Regulations as a large combustion installation. As such, the installation has set limits on atmospheric emissions of nitrous oxides (NO_x), sulphur oxides (SO_x), carbon monoxide (CO), methane (CH_4) and volatile organic compounds (VOCs).

Figure 4.30 shows the combustion emissions (excluding CO_2) for 2016.

All emissions were within limits set by OPRED in the Voyageur Spirit FPSO PPC Permit.

The Voyageur Spirit FPSO is also regulated under the European Union Emission Trading Scheme (EU ETS) Regulations, which regulate CO_2 emissions for

combustion sources, such as turbines and flaring. Gas is exported via the CATS pipeline.

CO_2 emissions as a result of combustion sources are presented in Figure 4.31.

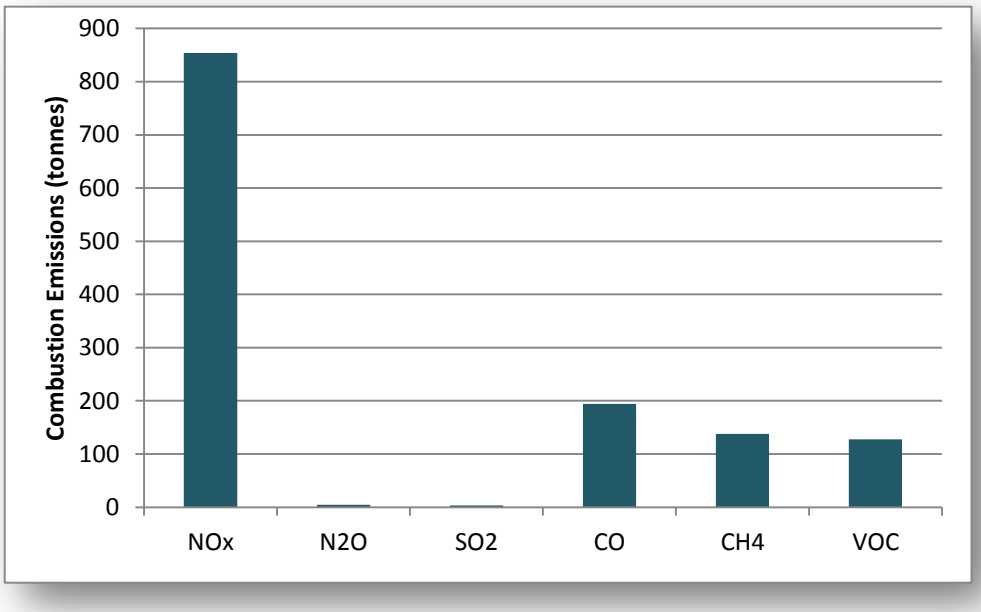

Figure 4.30 Voyageur Spirit FPSO Combustion Emissions

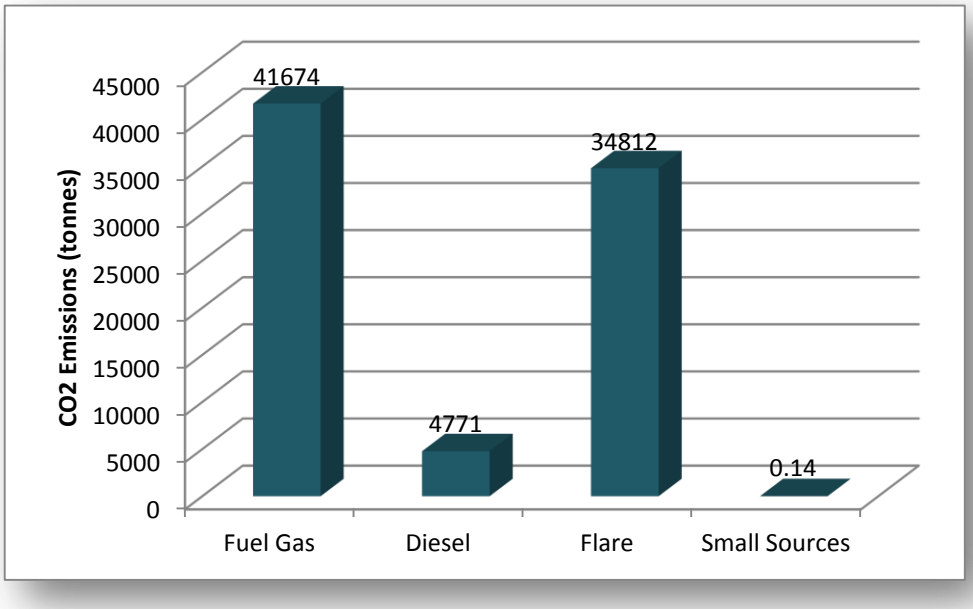

Figure 4.31 Voyageur Spirit FPSO CO2 Emissions: Combustion and Flaring

(e) Catcher Drilling (Ensco 100)

Atmospheric emissions during drilling operations are generated as a result of fuel combustion for power generation and also during well test operations. There were no well test operations related to Solan drilling during 2016, however, six well tests were conducted during 2016 Catcher drilling operations.

Combustion emissions from Catcher drilling operations (excluding CO_2) are shown in Figure 4.32. In addition 27,778 tonnes of CO_2 were released during 2016.

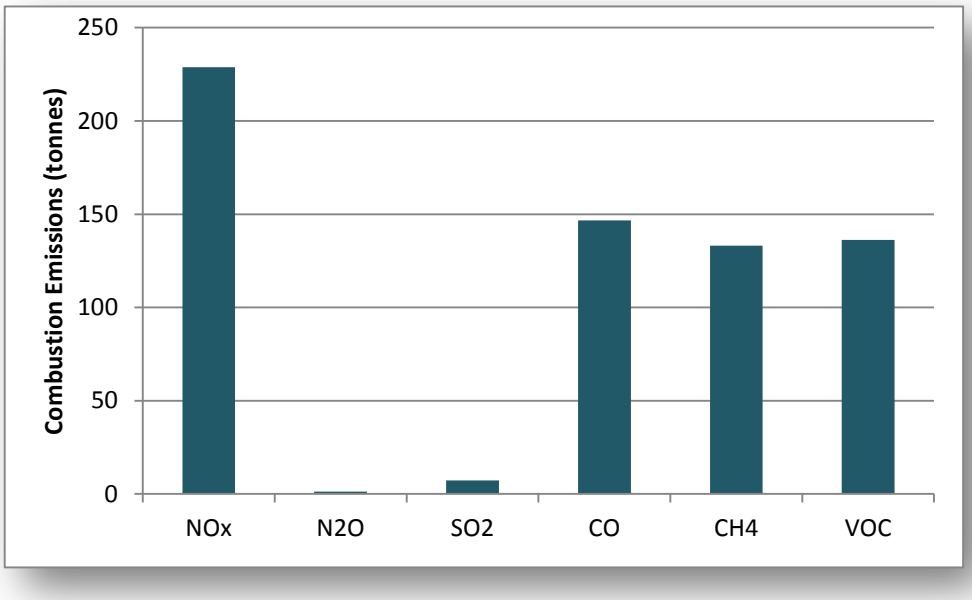

Figure 4.32 – Combustion Emissions – Catcher drilling operations

(f) Solan and Bagpuss Drilling (Ocean Valiant)

Combustion emissions from Solan and Bagpuss drilling operations (excluding CO_2) are shown in Figure 4.33. In addition 9,155 tonnes of CO_2 were released during 2016.

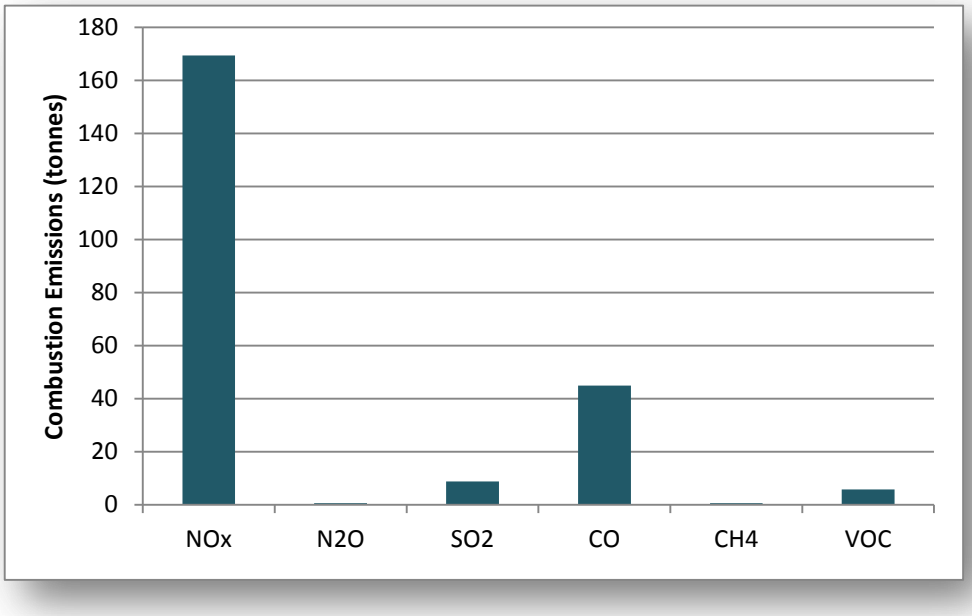

Figure 4.33 – Combustion Emissions – Solan and Bagpuss drilling operations

5.0 INCIDENTS

Premier strives to prevent the unplanned release of hydrocarbons and chemicals, however, on occasion accidental releases do occur. All unplanned releases of hydrocarbons and chemicals to sea from offshore oil and gas installations and pipelines, regardless of size, are reported to OPRED and other statutory agencies via the Petroleum Operations Notice 1 (PON1) form. Permitted Discharge Notifications (PDN's) are also submitted using PON 1 forms when permitted discharges are in breach of conditions / limits associated with the installations Oil Discharge Permit.

A number of processes are in place to prevent unplanned releases and these include planned maintenance of equipment, asset integrity inspections, activity risk assessment, area inspections, pre-acceptance drill rig and routine audits, procedural controls and training and competency for individuals interacting with process plant. Oil Pollution Emergency Plans (OPEPs) approved by OPRED are in place covering all operational assets including third party drilling installations. These plans are exercised on a regular basis and followed in the event that an unplanned release does occur, to ensure that the incident is reported in a timely fashion and that contingency and mitigation measures are in place.

5.1 Unplanned Releases – PON 1

During 2016, a total of 39 PON1s were submitted to the regulator for unplanned releases. 26 of these reports were directly attributable to Premier operated assets as shown in Figure 5.1. These releases equate to a total of 2.75 tonnes of hydrocarbon and 3.01 tonnes of chemical released.

As shown in Figure 5.2 a further 13 PON1s were submitted in relation to facilities not operated by Premier. These included five PON1s from drilling rig activities, seven from Subsea construction vessel activity on the Catcher field and a further single PON submitted in relation to an unknown, third party passing sheen.

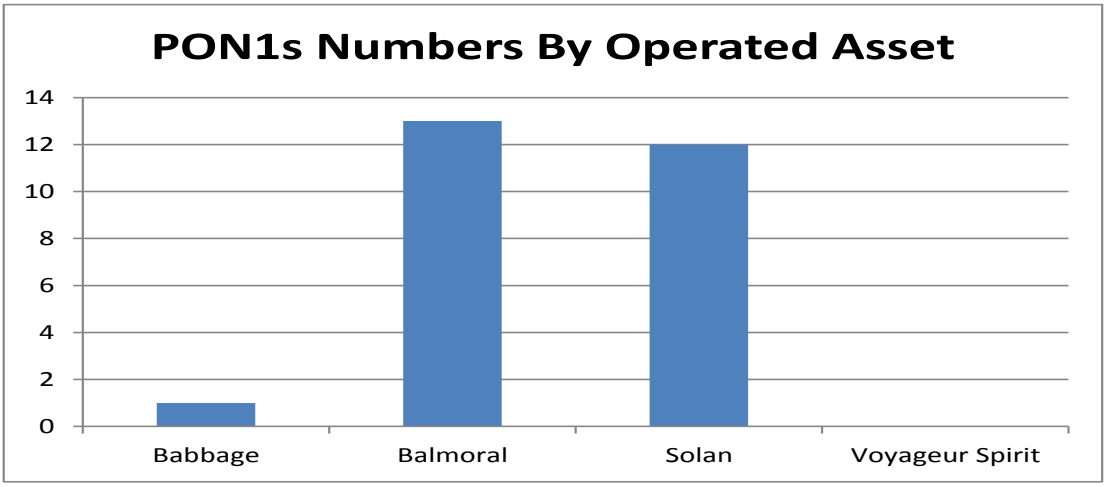

Figure 5.1 Unplanned releases from Premier Operated Assets during 2016

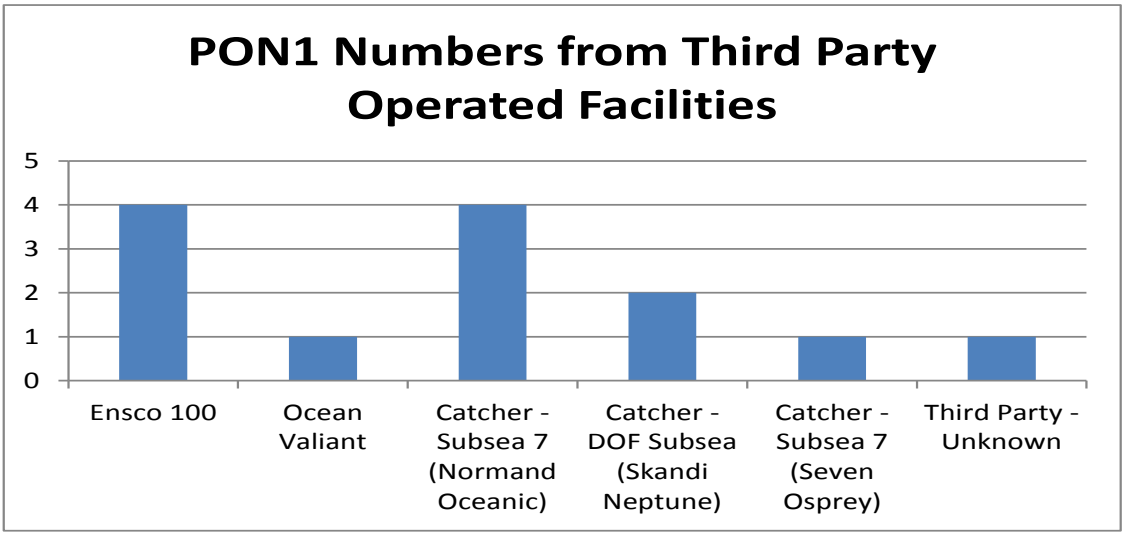

Figure 5.2 Unplanned releases from Assets Controlled by Third Parties during 2016

A significantly higher number of releases were reported in 2016 (39 as compared 12 in 2015). Increased activity and workshops, expansion of operations i.e. acquisition of ex E.ON assets, along with an extremely robust reporting regime (i.e. reporting of spills of as little as 0.002 kg hydrocarbon), have contributed to this increase.

Importantly, the actual mass of chemical releases in 2016, although higher than the 2012-2014 period of limited activity, showed a significant reduction from 2015 data. This is mainly due to improved focus on the management of subsea infrastructure and significantly improved subsea chemical monitoring regimes which enable far quicker identification of fluid loss.

5.2 Regulatory Non-Compliance (NC)

A total of 20 Non-compliances were raised in relation to environmental legislation or permit condition breaches during 2016.

Two internal incident investigations were completed in relation to these non-compliances, one in relation to the European Union Emissions Trading Scheme (EU ETS) and the other in relation to the Fluorinated Gas (F-Gas) Regulations.

A total of seven non-compliances were raised in relation to EU ETS and four in relation to F-gas management. In addition, five non-compliances were raised against the Offshore Chemical Regulations (OCR). These included two uses of unpermitted chemicals, two over-uses of chemicals and one chemical discharged in contravention of specified discharge points. Three non-compliances against the Oil Pollution Prevention and Control (OPPC) Regulations and one in relation to the Pipelines Work Authorisations legislation were raised.

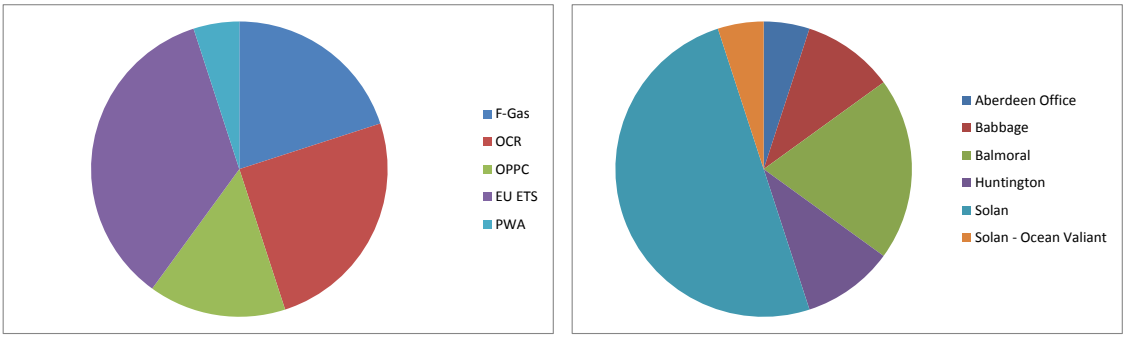

Figure 5.3 Non compliances by permit type and by installation

6.0 ENVIRONMENTAL PERFORMANCE AGAINST TARGETS

Table 6.1 describes progress against UKBU objectives and targets set for 2016.

Objective/Target	Progress
Improve communication and consistency of environmental support / management processes.	During 2016 a new series of weekly cross-asset environmental meetings were established. A communications register to record external key correspondence was developed and a specific time out for Environment campaign was rolled out to all assets.
Sub-sea Awareness Campaigns	Pre-mobilisation awareness sessions were conducted for all operations. Awareness pack was developed and delivered to the DSV teams for each campaign.
Improve identification and classification of environmental incidents	Monthly Synergi meetings introduced to discuss categorisation, and quality of environmental incident reports, and as a mechanism to promote lateral learning across the organisation.
Identify and implement improvements in reporting of unplanned release incidents	Awareness given to all operational teams on reporting of unplanned releases to sea – PON1 management roll out
Develop Environmental Performance Standards for operated assets	Oily Discharge, F-Gas and EUETS performance Standards developed for Balmoral and Solan Assets
Review and develop oil spill response capabilities	Solan Tactical Response Plan (TRP) developed and TRP workshop held with members of the ERT. Spill response contract signed with BP. Exercise Norther Gannet oil spill response exercise completed including participation of BEIS, MS, JNCC and SIC – no significant concerns identified.
Review current provision of environmental legal registers for BU	Registers reviewed and identified as offering limited value and hence requiring improvement. Alternative mechanisms reviewed and decision to implement Compass Lite tool to track legal requirements and demonstrate conformance. Work to be under be under Mechanisms to maintain

Table 6.1 – Premier UKBU Environmental Performance against Targets