

## TALISMAN SINOPEC ENERGY UK LIMITED

**2015 ENVIRONMENTAL STATEMENT** 



### **CONTENTS**

#### 01 INTRODUCTION

#### 02 UK OPERATIONS

Fields & Installations
Oil & Gas Production
Drilling

## 03 ENVIRONMENTAL MANAGEMENT

## 06 ENVIRONMENTAL PERFORMANCE

Discharges to Air
Discharges to Sea
Oil in Produced Water
Production Chemicals
Drilling & Pipeline Chemicals
Accidental Releases
Waste Management

#### 16 APPENDICES

Glossary Data Table TSEUK strive to provide a reliable, safe and efficient energy supply, and to continuously improve to meet the demands of the current challenges within the oil and gas industry whilst delivering environmental performance that meets or exceeds regulation.

2015 was a year of change and challenge. At an asset level the Beatrice complex and Nigg Oil Terminal were returned to TSEUK from Ithaca, and Talisman Energy Inc. was bought by Repsol. Challenges came in the form of a significant decrease in the price of crude oil which of course not only affected TSEUK but also the industry as a whole. The UKCS is a mature operating basin, where production rates tend to be lower and operating costs tend to be higher than other parts of the globe. However, these changes and challenges have not reduced TSEUK's commitment to operating in the UKCS, nor meeting the UK energy demands, and in doing so in a way which is safe and environmentally responsible.

Efforts towards minimising the environmental impact of energy exploration and production are demonstrated through the targets we set for ourselves each year and the rigour in which we monitor all our operations against these targets. Furthermore our own Environmental Management System was successfully re-verified by an independent third party in 2015.

This report provides an analysis of our 2015 performance and illustrates the commitment to communicating in an honest, transparent and responsible manner.

2015 saw a further improvement in unintended releases to sea when compared to 2014. These releases had minor or no impact on the environment. Each case was investigated to identify the root cause, to help prevent future reoccurrence. We maintain that further improvements can still be made and we will continue to focus on this area in 2016.

In 2015 the percentage of waste going to landfill increased. Although, we do work with our vendors and waste management company to minimise waste going to landfill, waste performance is dictated by some degree by the types of operations performed in any given year. For instance, 2015 saw the requirement to perform a number of pigging operations which are necessary to assure the integrity of our pipelines. In addition, the wells we drilled generated certain types

of wastes which legally can only be disposed of in designated landfill sites.

The amount of chemicals used and discharged at our production sites increased when compared to 2014, this was due to the fact that our sites had better 'uptime' and improved production rates when compared to 2014. However, the amount of drilling chemicals decreased due to a reduction in drilling activities. We continue to seek to use less hazardous chemicals, and in 2015 we stopped the use of five chemicals with a 'Substitution' warning.

At a company level 2015 saw an increase in  $\mathrm{CO}_2$  emissions, as with chemical use at our production sites this was due to better 'uptime' and improved production rates. However, because of these improved production rates we produced more oil for each unit of  $\mathrm{CO}_2$  emitted when compared to 2014. So in 2015, our production operations were more efficient from an emissions point of view.

It is clearly not desirable to release any oil to sea, the UK Regulator (DECC) places strict limitations on both the concentration and quantity of oil discharged in order to protect the marine environment. Improvements occurred in 2015 to our oil in produced water concentrations. At these low concentrations, oil quickly disperses and is broken down by weathering and marine microorganisms. The internationally agreed emission limit enforced by DECC is 30mg of oil per litre (average over one month). In 2015, the average discharge concentration for our company improved to 12.61mg/I which was significantly below the legal performance standard.

Our operations present a wide range of challenges, we take our responsibilities seriously, and we make a positive contribution to the communities in which we operate.

Garry Beattie Manager, HSE

## **UK OPERATIONS**

#### Fields & Installations

In 2015, our company produced oil and gas from 51 offshore fields, operated the Flotta Terminal and 11 offshore production installations including a Floating Production Storage and Offloading (FPSO) vessel. In addition, Wood Group PSN operated the Beatrice complex and Nigg Terminal on our behalf.



Our principal UK operating areas, (shown on page 2) encompass a total of 51 fields, 12 operated assets, and 2 assets operated by Wood Group PSN which are detailed in Tables 1 and 2.

#### Oil & gas production

Oil reservoirs contain a mixture of oil, produced water and natural gas. A primary purpose of an offshore production platform is to separate out the extracted 'well fluids' into these three separate components using separation vessels. Once the oil has been separated from the gas and water, it is pumped to shore via subsea pipelines; or, in the case of oil from the Ross and Blake fields, shipped to shore. The gas is dried and then compressed. Some of the gas, where possible, is used to generate power to run the process equipment and the remainder of the gas is exported via pipeline to the UK mainland (see Table 1), used for gas lift, or flared.

The proportion of oil, gas and water produced from reservoirs changes over time. Oil and gas production will decrease and the volume of water will increase. The separated water, known as produced water, is treated to remove oil droplets prior to discharge to sea.

#### **Drilling**

As the fields mature and more information about the reservoirs becomes available, more wells may be drilled or existing wells may be revisited. This can be done either from the platform, or with mobile drilling rigs. Geological information and production tests determine how many wells are needed to produce the oil and gas effectively.

#### **HYDROCARBON FXPORT ROUTES** Table 1

Installation	Oil	Gas
Arbroath	Via Montrose	Via Montrose
Auk	Via Fulmar	N/A
Beatrice	Nigg Oil Terminal	N/A
Bleo Holm	Shuttle Tanker	Frigg Pipeline
Buchan	Forties Pipeline	N/A
Claymore	Flotta Pipeline	N/A
Clyde	Norpipe Pipeline	St Fergus Line
Fulmar	Norpipe Pipeline	St Fergus Line
Montrose	Forties Pipeline	CATS Pipeline
Piper B	Flotta Pipeline	Frigg Pipeline
Saltire	Via Piper B	Via Piper B
Tartan	Flotta Pipeline	Frigg Pipeline

#### FIELDS & INSTALLATIONS Table 2

FIELD	BLOCK	INSTALLATION
Arbroath	22/18	Arbroath
Arkwright	22/23a	Arbroath
Auk	30/16	Auk
Auk North	30/16n,t	Fulmar
Beatrice	11/30a	Beatrice Complex
Beauly	16/21	Balmoral*
Blake	13/24b	Bleo Holm
Brechin	22/23	Montrose
Buchan	21/01	Buchan
Burghley	16/22	Balmoral*
Carnoustie	22/17	Arbroath
Cayley	22/17s	Montrose
Chanter	15/17	Piper B
Claymore 14/19	14/19	Claymore
Claymore 14/20b	14/20b	Claymore
Clyde	30/17b	Clyde
Duart	14/20b	Tartan
Enoch	16/13a	Brae*
Fulmar		Fulmar
	30/16	
Galley	15/23	Tartan
Godwin	22/17n & 22/17s	Arbroath
Halley	30/12b	Fulmar
Hannay	20/05c	Buchan
Highlander	14/20	Tartan Alpha
lona .	15/17	Piper B
Leven	30/17b	Clyde
Medwin	30/17b	Clyde
Montrose	22/17	Montrose
Nethan	30/17b	Clyde
Orion	30/18	Clyde
Petronella	14/20	Tartan
Piper	15/17	Piper B
Ross	13/29	Bleo Holm
Saltire	15/17	Saltire
Scapa	14/19	Claymore
Shaw	22/22a	Montrose
Tartan	15/16	Tartan Alpha
Tartan North Terrace	15/16b	Tartan Alpha
Tweedsmuir	21/01a	Piper B
Wood	22/18	Montrose
Affleck*	30/19a	Clyde via Janice FPU*
Andrew*	16/27a	Andrew*
Balmoral*	16/21b,c	Balmoral*
Blane*	30/03	Ula*
 Cawdor*	30/13 & 30/14	Clyde
Flyndre*	30/13 & 30/14	Clyde
Glamis*	16/21a	Balmoral*
MacCulloch*	15/24b	North Sea Producer*
Stirling*	16/21b,c	Balmoral*
Wareham*	98/06a,07a	Onshore
Wytch Farm*	98/06a,07a	Onshore
* Not operated by the compan		01131101 0

Not operated by the company therefore data is not included in this report.

#### **ENVIRONMENTAL MANAGEMENT**

The company has an integrated Safety and Environmental Management System (SEMS). The environmental elements of the system have been independently verified as meeting the requirements of the Oslo-Paris Convention (OSPAR) Recommendation 2003/5 to promote the use and implementation of Environmental Management Systems by the offshore industry.

## Minimise impact and continuous improvement

Our environmental commitment, as outlined in our corporate HSE policy, is to minimise our impacts and always comply with the law or the company's standards, whichever are higher. All environmental aspects including climate change, air quality, water quality and waste are issues that receive constant attention to minimise our environmental impacts. The environmental impacts from oil and gas exploration and production activities have been minimised as far as practicable through the design of the installations and subsequent modifications made to plant and process.

## We follow a 2-phase environmental management strategy

The first phase consists of the identification and characterisation of our environmental impacts to determine their significance and how to manage them. This considers local environmental sensitivities, company and legislative performance standards and stakeholder concerns.

The second phase involves the development and implementation of environmental management strategies that are integrated with business and operational systems, and are in concert with all company performance improvement objectives: such as safety, installation integrity and security of supply.

#### Targets and objectives

Our Senior Leadership Team set annual environmental targets against which performance is tracked. Each is set with a view to achieving the overarching objective of continuous improvement. To ensure all of our installations work towards achieving the targets, a performance contract is agreed with the site leadership team and company personnel.



#### Permits and consents

Our conduct in the North Sea is governed by a range of legislation and we are required to hold a number of permits and consents that authorise our operations. These permits and consents come with detailed operating conditions to which we must adhere.

We track and investigate non-compliance (permit breaches) to measure and continually improve the effectiveness of our systems, processes and procedures.

# ENVIRONMENTAL MANAGEMENT BY DESIGN AND MAINTENANCE

Our installations are designed and maintained to minimise their environmental impact.

Primary impact mitigation measures have been integrated into the design of the facilities and include:

- Closed system processes to safely contain reservoir fluids in vessels and flow lines under all process conditions.
- Pressure, temperature, flow control and shutdown systems to maintain safe operating conditions at all times.
- Bunding of areas with a potential for spills.

Secondary defence measures are those that relate to the operation of the facilities and include:

- Corrosion prevention and monitoring programmes and preventative maintenance programmes ensure that vessels, flow lines, valves, fittings and equipment remain in a safe operating condition.
- Consideration of all potential accidental/emergency scenarios to ensure procedures and resources are in place for prevention, control and mitigation.
- Procedures to minimise operational leaks and spills and ensure availability of clean-up equipment to deal with spillages.
- > Training of platform personnel to operate and maintain the above safeguards in good working order.

# DISCHARGES TO AIR



TSEUK supports sensible, economic measures that will improve energy efficiency and reduce atmospheric emissions. We comply with all regulatory emissions limits and pursue voluntary emissions reduction opportunities by integrating energy efficiency and regulatory targets into business operations.

During normal operations an installation burns fuel gas and diesel for power generation and flares the gas it cannot use or export for safety reasons. The combustion of hydrocarbons results in the emission of  $\mathrm{CO}_2$  and other greenhouse gases (GHGs). The level to which GHG's contribute to global warming depends on the type of gas, for example 1 tonne of methane ( $\mathrm{CH}_4$ ) has an effect on the atmosphere equivalent to 21 tonnes of  $\mathrm{CO}_2$ .

In order to comprehensively assess the impact of our operations, GHGs are combined and expressed as tonnes of  $\mathrm{CO}_2$  equivalent.  $\mathrm{CO}_2$  e / 1000 BOE has also been used as an environmental measure of production efficiency.

**Figure 1** shows an increase in company level  $\mathrm{CO_2}$  e emissions in 2015; primarily due to increases in fuel and flare gas combustion. The observed decrease in  $\mathrm{CO_2}$  e / 1000 BOE represents increased production uptime and efficiency. Therefore, for every unit of  $\mathrm{CO_2}$  e emitted TSEUK produced more oil in 2015.

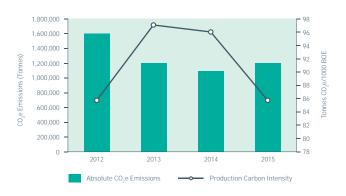
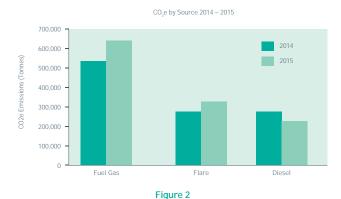


Figure 1
CO, Equivalent emissions and production intensity annual trend



2015 CO<sub>2</sub> Equivalent emissions by source

Figure 2 shows the contribution of  ${\rm CO_2}$  e from each source over the last 2 years. In 2015, emissions from fuel and flare gas increased while emissions from diesel decreased, again reflecting improved process uptime in 2015 compared to 2014.

The European Union Emissions Trading Scheme (EU ETS) is a cap and trade system for  $\mathrm{CO}_2$  emissions arising from fuel combustion and flaring. **Figure 3** shows how each site performed against its Government allocated allowance or 'cap' in 2015. All TSEUK sites emitted a greater mass of  $\mathrm{CO}_2$  than their allocated free allowance. In line with the requirements of the EU ETS, the short fall was purchased through a designated mechanism so that these sites had sufficient allowances to account for their  $\mathrm{CO}_2$  emissions.

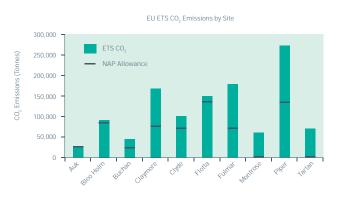
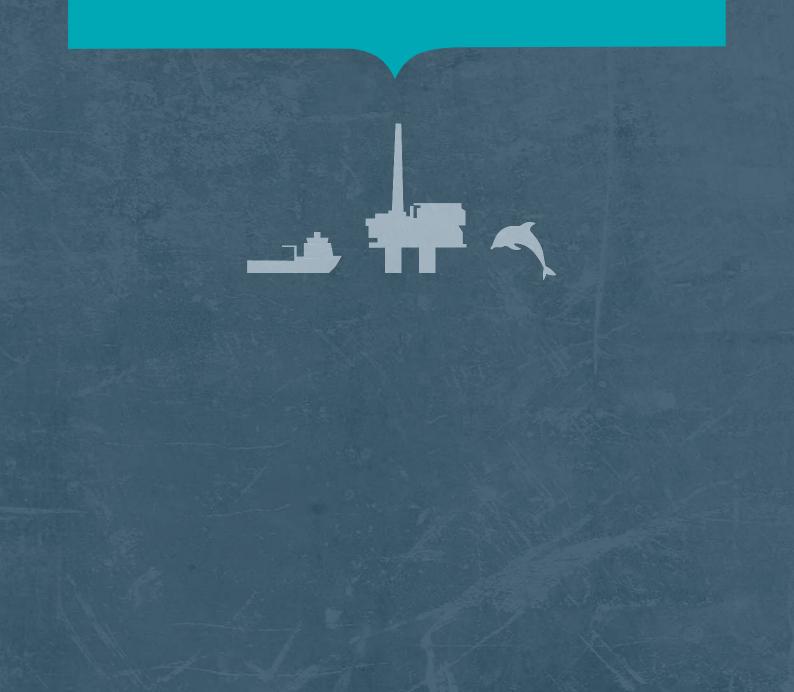


Figure 3
2015 EU-ETS CO<sub>2</sub> emissions and allowance per site

# DISCHARGES TO SEA



#### **OIL IN PRODUCED WATER**

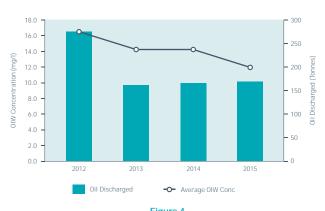
The fluid extracted from most oil wells contains a mixture of oil, gas and water. A primary function of all our offshore installations is to separate the gas and water, sending the oil onshore and safely discharging the treated water to sea. Following treatment some oil will still be present in the discharged water.

While it is clearly not desirable to release any oil, industry regulators place strict limitations on both the concentration and quantity of oil discharged in order to protect the marine environment. At these low concentrations oil quickly disperses and is broken down by weathering and marine microorganisms.

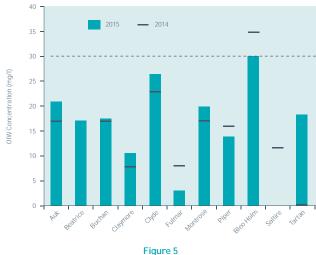
The UK government through the "Offshore Inspectorate" of the Department of Energy and Climate Change (DECC) enforces a standard, internationally agreed emission limit value of 30mg of oil per litre of produced water discharged (average over one month).

**Figure 4** shows that while the total mass of oil discharged to sea shows a small increase; the average discharge concentration continues to show steady improvement, achieving to 12.61mg/l in 2015. This is significantly below the legal performance standard.

Figure 5 shows that 2015 oil in water concentration has increased at a number of sites when compared with 2014 data. This is predominantly due to sites returning to operations after prolonged shut down periods and maintaining sustained process uptime. However, due to the large volumes of water discharged by Fulmar and Piper, the notable improvements in their oil in water performance has made a significant contribution to improving the annual company average demonstrated in figure 5. It is also worth noting that the Bleo Holm's oil in produced water performance has returned to the 30mg/l standard.



Annual total oil and produced water to sea



Site Oil in Produced Water Performance

The total mass of oil discharged to sea in 2015 shows a slight increase when compared with earlier years. However, this rate of increase is notably lower than the corresponding produced water volume, demonstrating the overall improvement in Oil in produced water performance.

Due to the nature of produced water, discharges can give rise to an oil sheen on the sea surface around the installation. On occasions, either due to poor plant performance or calm weather, sheens can extend some distance from the discharge point. Where these sheens become more significant than normal, we are required to notify DECC. Three such notifications were raised by TSEUK during 2015.



Figure 6
Annual Discharge Mass

#### PRODUCTION CHEMICALS

We utilise a variety of chemicals within the production process to optimise efficiency. Chemicals are used to improve the flow of fluids from the reservoir, aid separation, prevent corrosion and remove deposited solids within vessels topsides. Production chemicals are then either exported with oil to shore, or discharged to sea from the produced water stream.

The use and discharge of production chemicals is heavily regulated by DECC through the approval of a Life Permit for each asset and regulatory limits are integrated into our operations. DECC regulates chemical use and discharge through the Offshore Chemicals Regulation (OCR) 2002 (as amended). These regulations implement the OSPAR Decision 2000/2 on a Harmonised Mandatory Control System (HMCS) for the Use and Reduction of the Discharge of Offshore Chemicals on the UK Continental Shelf. The HMCS decision details requirements for the comprehensive testing, ranking, hazard assessment and risk management of chemicals and in addition the substitution of certain chemicals by less hazardous alternatives. The use and discharge of substitution chemicals is directly affected by two main factors; uptime of the individual assets and swap out of substitution chemicals for more efficient, less hazardous alternatives.

**Figure 7** shows the tonnage of production chemicals used and discharged per year.

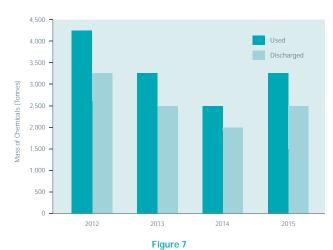
2015 shows an increase on 2014 data which can be directly attributed to increased uptime of the installations and reinstatement of production of wells from long term shut in achieved from well intervention campaigns. Additionally, in 2015 annual shutdowns were rationalised and executed within planned timeframes.

Some chemicals have a substitution warning meaning they contain a component that may present a hazard to the marine environment. An important part of the HMCS is the replacement of these harmful chemicals through a phase out approach.

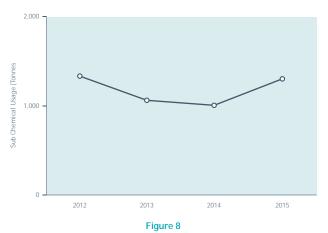
**Figure 8** shows an increased usage of substitution chemicals in 2015 compared to 2014. However, as with other production chemicals, this is directly attributable to the uptime of the installations in 2015 rather than the addition of new chemicals which contain a substitution warning.

We actively work with our chemical vendors to identify greener chemistries to progress replacement of products with substitution warnings with less hazardous versions. In 2015 we successfully swapped out 5 chemicals which impacted a number of our installations. We also actively review our life permit applications and remove unused products from these permits.

To aid continual improvement and chemical swap out to less hazardous products, on an annual basis, we review substitution chemicals use on our installations with our vendors to identify priority chemicals for swap out for the coming year. Chemicals identified and agreed for swap out are then translated as a KPI within the annual chemical vendor contracts. To ensure focus remains these KPIs are monitored at project specific and quarterly business review meetings.



Production Chemicals Used & Discharged



Usage of Chemicals with Substitution Warning 2012 - 2015

#### **DRILLING & PIPELINE CHEMICALS**

An array of chemicals are used to facilitate the safe handling of Wells during Drilling, Well Intervention and Pipeline Operations. Where appropriate, chemicals are specifically selected to optimise intended operations and performance with focus given to greener chemistries.

As can be seen from **Figure 9** there was a significant decrease in chemical use and discharge from 2014 to 2015. This is directly attributed to the level of activity during the year and the significant cost saving exercise that was undertaken.

In 2015, two Wells were drilled in their entirety, one further Well was drilled and suspended for completion in 2016, and a Well re-entry was conducted to perform an extended well test. Additionally, a significant Well intervention was conducted utilising a MODU to recover the existing completion and install a new completion on a subsea well.

Numerous pipeline and well intervention operations were conducted throughout 2015 to reinstate, maintain, and enhance well performance through planned improvement opportunities.

Figure 10, demonstrates a marked contrast in quantities of chemicals used and discharged when comparing Pipeline, Well intervention and Drilling activities. Drilling operations use large quantities of chemicals but only a small proportion are discharged to sea. This is, in part, due to the fact that Oil Base Muds (OBMs) are shipped onshore for treatment to recover the base oil which is then recycled. Pipeline operations in contrast, will discharge most chemicals through flushing but the quantities involved are low compared to well operations. While well intervention chemicals are generally routed back to the production installation, and discharged at the host installation along with the produced water.

As with the production related chemicals, reducing the number of substitution chemicals used during drilling operations, including platform drilling, is an area of focus

Due to the very specialist nature of chemicals used during these complex activities, alternative chemistries which provide the same or improved performance are often limited. TSEUK continues to work closely with chemical vendors and drilling contractors to replace substitution chemical products where it is operationally feasible to do so.

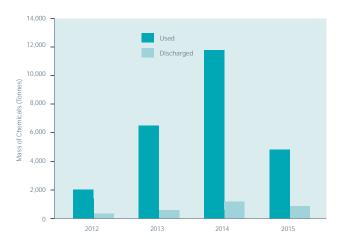


Figure 9
Total Chemicals Used & Discharged During Drilling,
Well Intervention & Pipeline Operations

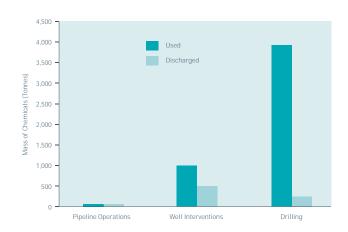
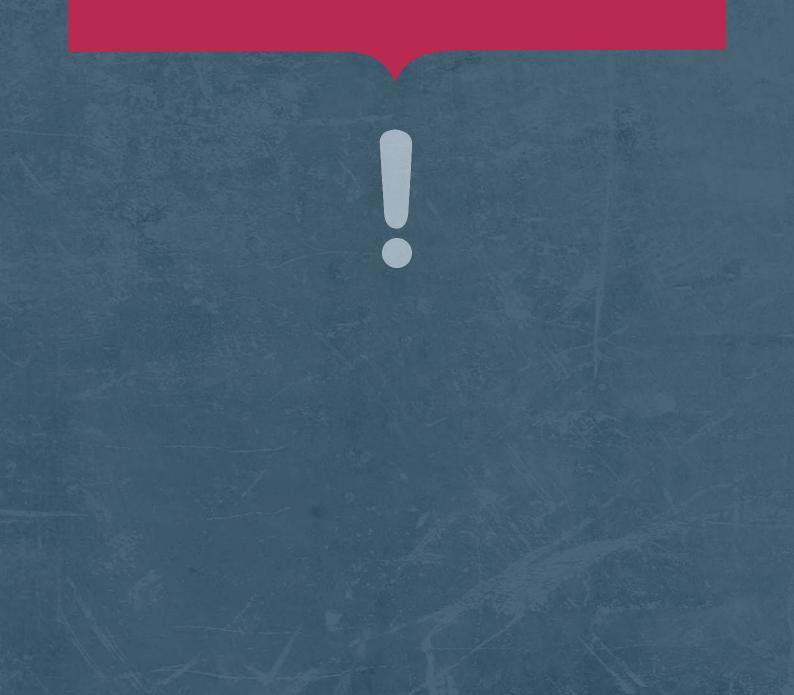


Figure 10
2015 Chemical Use & Discharge by Operation

# ACCIDENTAL DISCHARGES



The prevention of oil, gas and chemical leaks is TSEUKs first Golden Rule. The assurance of plant integrity is seen as critical to the ongoing prevention of spills across our assets. We also prevent spills by ensuring that our people are aware of spill risks, are competent to perform their duties, adhere to TSEUK operating procedures and environmental permit requirements.

In 2015, spill prevention remained a central focus for both on and offshore teams. Through continued focus, the total number of spills that occurred in 2015 sustained a downward trend to 27 in comparison to 36 spills in 2014. The total mass spilled in 2015 was 4.7 tonnes; 1.4 tonnes of these spills were oil releases, the remainder were accidental chemical releases.

Our identification and reporting culture of environmental releases remains at an excellent level across our sites, demonstrated by the fact that 7 of the 27 spills reported in 2015 were <1kg. We had only two releases which were greater than a tonne.

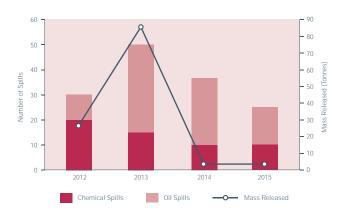
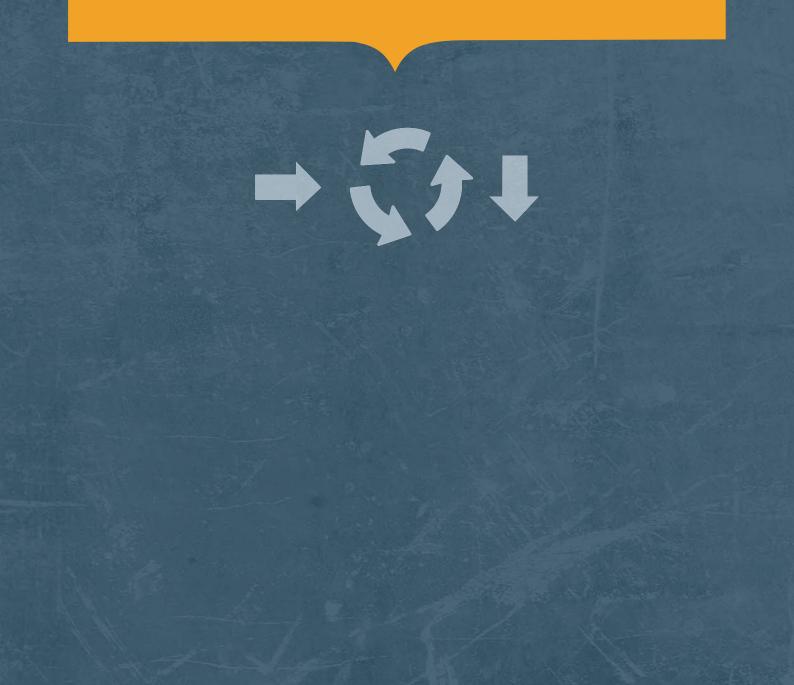


Figure 11
Total number of oil and chemical spills, and total annual mass released

2015 Spill Incidents (> 1 Tonne)	Mass Released (Tonnes)
A passing valve on the Claymore installation subsea hydraulic control system caused a release of subsea hydraulic fluid. It should be noted that during normal operations, 100% discharge of this chemical is legally permitted.	1.26
A release of lube oil occurred on the Auk installation, the cause of which was a faulty weld within a lube oil cooler unit which allowed lube oil to migrate into the seawater side of the cooling system.	1.14

Spill prevention will remain a focus in 2016 and future years for all TSEUK sites. The TSEUK Environment team continues to work closely with colleagues both on and offshore, as well as our contractors to drive continual improvement in this area

# WASTE MANAGEMENT



Waste Management is a key topic for the energy industry. TSEUK utilises materials that will generate waste including drill cuttings, metals, waste chemicals, waste oil, paper, glass and wood. In conjunction with our environmental policy, we work to move our waste up the waste hierarchy.

We work closely with our waste management contractors to drive improvements in waste disposal practices. This includes the provision of more waste bins to the assets, increasing waste segregation awareness among the workforce or exploring new waste management routes.

Figure 12 shows that total waste generated in 2015 has increased overall. Hazardous waste is comparable to 2013 levels, however the volume of non-hazardous waste is greater. This is down to the large amount of maintenance and upgrade work that took place in 2015 which generated significant quantities of nonhazardous materials.

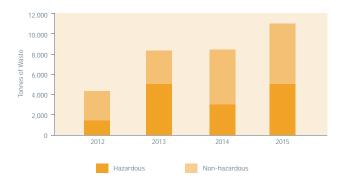


Figure 12 Total Hazardous & Non-hazardous Waste Produced 2012 - 2015

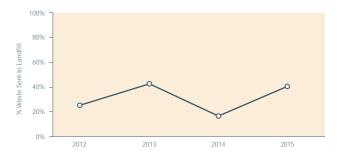
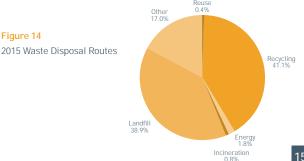


Figure 13 39% Waste Sent to Landfill

As shown in **Figure 13**, the proportion of waste material sent to landfill has increased because of improved process uptime which generates considerable domestic and routine wastes that cannot be re-used or recycled. Furthermore, a number of pigging operations were carried out which produced a large volume of waste sand and scale which must also be sent to landfill. In addition, due to the nature of the formations being drilled in 2015, a higher proportion of oil based mud was used compared to 2014. This material, even after treatment, can only be disposed of in landfill.

Waste materials generated offshore are segregated by type and shipped to shore for re-use, recycling, or safe disposal by a licensed waste company in full compliance with UK waste legislation. We actively pursue ways of managing our waste streams up the waste hierarchy, this involves taking advantage of opportunities to reduce, reuse, recycle, recover energy, or responsibly dispose of waste.

Figure 14 shows the 2015 waste disposal routes, with 41% of waste being recycled which is an increased rate compared with 2014 and coincides with the industry average in 2015.



## **GLOSSARY**

BLP	Bridge Linked Platform
CEFAS	Centre for Environment, Fisheries & Aquaculture Science
CH4	Methane
СО	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DECC	Department of Energy and Climate Change
EEMS	Environmental Emissions Monitoring System
EMS	Environmental Management System
EU-ETS	European Union Emissions Trading Scheme
FPS0	Floating Production, Storage, Offload vessel
GHG	Greenhouse Gas
HMCS	Harmonised Mandatory Control System
JNCC	Joint Nature Conservation Committee. This is the statutory advisor to the UK Government on national and international nature conservation.
JV	Joint Venture
KPI	Key Performance Indicator
MAR	Montrose Area Redevelopment
N <sub>2</sub> O	Oxides of Nitrogen
NM VOC	Non-Methane Volatile Organic Compounds
NOx	Nitrogen Oxide
OBM	Oil Based Mud
OCR	Offshore Chemicals Regulation 2002
OGUK	Oil & Gas UK is the leading representative body for the UK offshore oil and gas industry.
OPEP	Oil Pollution Emergency Plan
OSPAR	The Convention for the Protection of the marine Environment of the North East Atlantic.
PON1	Petroleum Operations Notice 1. This is the form used by operators to report any oil or chemical spills or sheens or unpermitted discharges
PPC	Pollution Prevention & Control Act 1999 and Offshore Combustion Installations (Prevention and Control of Pollution) Regulations 2001
SEPA	Scottish Environment Protection Agency
SOx	Oxides of Sulphur
TSEUK	Talisman Sinopec Energy UK
UKCS	UK Continental Shelf
WBM	Water based Mud

## **2015 DATA TABLES**

2015 Data Table 1	Atmospheric Emissions (Tonnes)						
SITE	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SO <sub>x</sub>	NOx	СО	NMVOC
Arbroath Platform	980	12	0	1	18	5	15
Auk A Platform	27,221	357	2	13	118	25	1,689
Beatrice	1,846	1	0	1	21	5	1
Blane	0	0	0	0	0	0	0
Buchan A Platform	41,591	71	2	17	349	110	85
Claymore A Platform	167,148	207	13	5	414	406	126
Clyde A Platform	93,619	139	6	30	325	120	174
Flotta Terminal	143,554	59	10	21	477	280	146
Fulmar A Platform	172,623	124	10	8	273	379	411
Montrose A Platform	62,637	91	4	14	224	128	102
Piper B Platform	261,628	347	18	14	579	623	131
Ross FPSO Bleo Holm	88,981	157	6	13	235	168	830
Saltire A Platform	413	0	0	0	8	2	0
Tartan A Platform	82,428	173	5	6	206	204	91
Pipeline Operations	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mobile Drilling	15,666	48	1	10	33	208	20
Non Operated Subsea Tiebacks	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	1,160,335	1,787	77	153	3,279	2,661	3,821

2015 Data Table 2	Produced Water			Chemicals (Tonnes)		Waste Generated (Tonnes)		Spills			
SITE	Average Oil In Water (mg/l)	Total Water Volume (m³)	Oil Discharged Weight (Te)	Used	Discharged	Hazardous	Non- Hazardous	# Oil Spills	# Chemical Spills	Mass Released (Kgs)	
Arbroath Platform	0	0	0	74	3	43	204	0	3	0.58	
Auk A Platform	21	228,260	5	22	12	13	202	2	0	1.15	
Beatrice	17	197,063	3	26	14	39	76	1	0	0.00	
Blane	0	0	0	0	2	n/a	n/a	0	0	0.00	
Buchan A Platform	18	173,684	3	45	39	9	244	0	0	0.00	
Claymore A Platform	11	2,541,813	28	616	489	48	564	0	2	1.27	
Clyde A Platform	27	590,241	16	355	3	44	395	1	1	0.01	
Flotta Terminal	3	8,072,504	24	n/a	n/a	38	833	0	0	0.00	
Fulmar A Platform	3	3,633,427	11	256	170	59	339	7	0	0.10	
Montrose A Platform	20	138,156	3	71	127	33	355	0	0	0.00	
Piper B Platform	15	4,981,133	73	553	364	62	350	1	3	0.95	
Ross FPSO Bleo Holm	30	850,961	26	1,165	1,053	22	178	1	1	0.58	
Saltire A Platform	0	0	0	0	0	3	86	1	0	0.00	
Tartan A Platform	19	154,833	3	93	69	24	209	0	0	0.00	
Pipeline Operations	n/a	n/a	n/a	48	57	n/a	n/a	0	0	0.00	
Mobile Drilling	n/a	n/a	n/a	3,914	219	4,516	2,144	1	2	0.02	
Non Operated Subsea Tiebacks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0.00	
Total	12.61	13,489,571	170	7,238	2,619	4,951	6,180	15	12	4.66	

Talisman House | 163 Holburn Street | Aberdeen | Scotland | AB10 6BZ

T +44 (0) 1224 352500

F +44 (0) 1224 353400

**W** www.talisman-sinopec.com

