

**Marathon Oil UK LLC**

**2015**

**Environmental Performance Report**



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# **1        PREFACE**

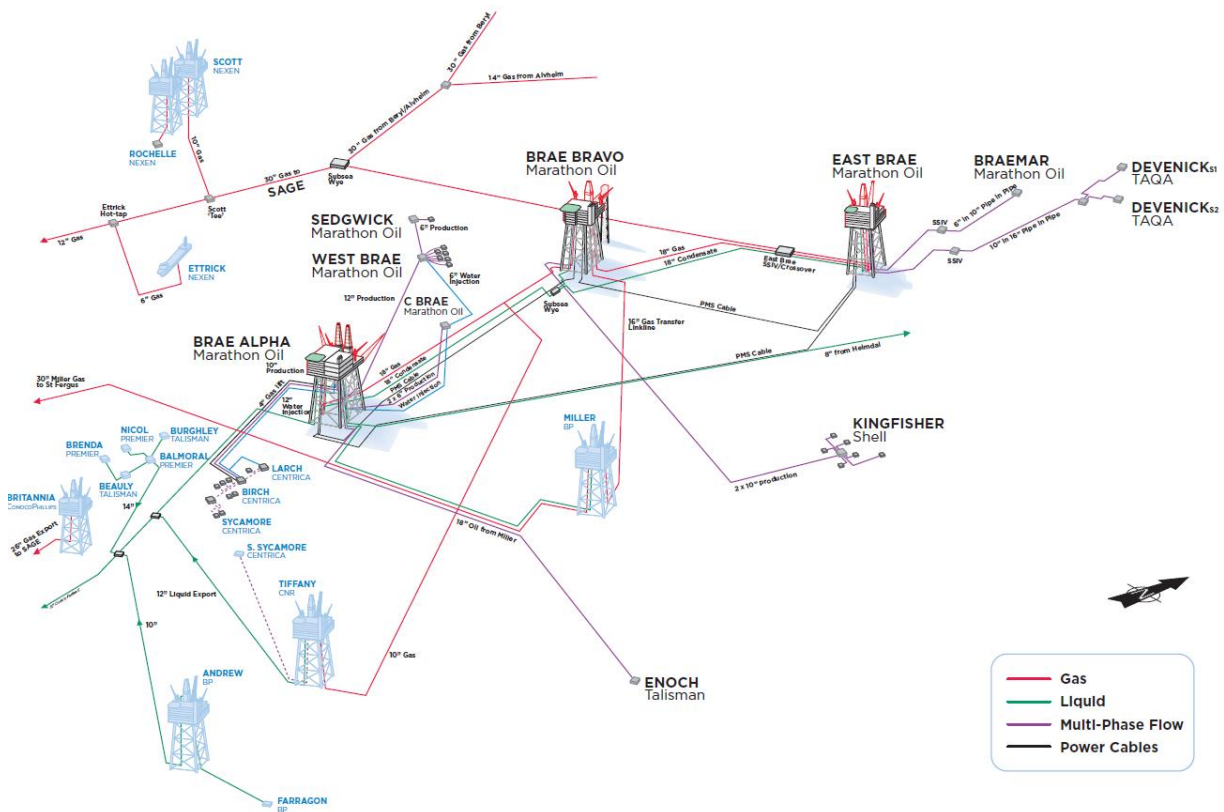
Marathon Oil UK LLC is committed to environmental protection and places significant emphasis and resources on minimising wastes, emissions and other releases through its operations. Environmental performance indicators are a key part of Marathon Oil's corporate and operational performance commitments with targets designed to drive continuous improvement. This report summarises the 2015 environmental performance for Marathon Oil's UK offshore operations.

## 2 OVERVIEW OF OFFSHORE INSTALLATIONS

Marathon Oil operates three interconnected platforms in the UK sector of the central North Sea - Brae Alpha, Brae Bravo and East Brae. The Brae platforms lie some 220 km from the UK coast and 8 km west of the median line with Norway. These installations act as a regional hub for oil and gas production and export from various Marathon Oil operated and third party operated fields and subsea tiebacks as illustrated in the figure below. Oil (and natural gas liquids) from these fields is exported through the Marathon Oil operated Brae to Forties pipeline and onwards via the Forties Pipeline System to the Kinneil reception terminal on the Firth of Forth. Gas from the Brae area is piped to the St Fergus gas terminal via a tie-in to the Scottish Area Gas Evacuation (SAGE) pipeline system.

Power for the three Brae platforms is distributed via a field ring main and controlled by a Power Management System (PMS). The PMS controls the power generated on the Brae Alpha and Bravo platforms, and enables electricity to be supplied to the East Brae platform which has no main power generation facilities of its own.

Overview of the Brae Area



Brae Area



## **2.1 BRAE ALPHA**

The Brae Alpha platform located in Block 16/7a, is a single, integrated platform consisting of drilling rig, production, utility and accommodation facilities. Production commenced in July 1983. Brae Alpha topside facilities process produced fluids from the Marathon Oil operated South, Central and West Brae (including Sedgewick) Field reservoirs plus fluids from the Birch, Larch and Sycamore (Trees) Field reservoirs which are operated by Marathon on behalf of Centrica. In 2007 Enoch, operated by Marathon on behalf of Talisman, was tied back to the Brae Alpha platform and brought online.

## **2.2 BRAE BRAVO**

The Brae Bravo platform is a single, integrated platform consisting of drilling rig, production, utility and accommodation facilities and is also located in Block 16/7a, 10km north of Brae Alpha. Production from Brae Bravo commenced in April 1988. Brae Bravo topside facilities process produced fluids from the Marathon Oil operated North Brae, Central Brae, Beinn and Bracken Fields plus fluids from the Kingfisher Field which is operated by Marathon on behalf of Shell.

## **2.3 EAST BRAE**

East Brae is a single integrated platform consisting of drilling rig, production, utility and accommodation facilities located in Block 16/3a to the north of Brae Bravo. Production from East Brae commenced in December 1993. East Brae topside facilities process produced fluids from the Marathon Oil operated East Brae and Braemar Field reservoirs. In October 2012 production commenced on the Devenick field subsea tie back, operated by Marathon on behalf of TAQA, to the East Brae platform.

## **2.4 DRILLING**

A campaign, which commenced in 2014, to drill two West Brae wells continued in 2015. Drilling and completion activity was undertaken from the semi-submersible rig WilPhoenix.

### 3 ENVIRONMENTAL MANAGEMENT AT MARATHON OIL

Marathon Oil UK LLC (MOUK) implements the Marathon Oil Corporation (MOC) Health, Environment, Safety Social and Security Management System, which is referred to as the Global Performance System.

The MOC Global Performance System describes the framework for the management of Health, Environment, Safety, Social and Security issues.

The MOUK Global Performance System is based upon the requirements of internationally accepted standards for HES Management Systems and is structured around 16 core elements that are aligned with the basic continuous improvement cycle of Plan – Do – Check/Correct – Review. This is illustrated below.

**GPS Plan-Do-Check/Correct-Review Cycle**



The environmental elements of Marathon Oil's UK management system have been externally verified and meet the requirements of the BS EN ISO 14001:2004 standard for environmental management systems. The external verification report was submitted to Department of Energy and Climate Change (DECC) in April 2014.

Overall environmental performance is continuously monitored and is subject to regular review at all levels within the organisation. On the Brae platforms, the responsibility for day to day environmental performance lies with the respective Platform Managers.

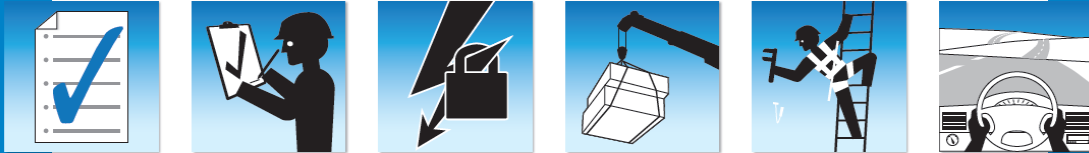
Environmental objectives and targets are developed as part of the annual business review and planning cycle for the Brae Area. Marathon Oil sets key environmental performance indicators at the beginning of each year and progress against these is reviewed regularly, to ensure that no significant deviations from these indicators occur.



## Statement of HES&S Beliefs

1. We will conduct all aspects of our business in a **SAFE, CLEAN, SECURE, RESPONSIBLE** and cost effective manner.
2. Our **ATTITUDE, ACTIONS and EXPECTATIONS** will make it obvious that we consider health, safety, security and environmental stewardship first in every operation.
3. **ALL WORKERS** must communicate openly, honestly and often regarding health, environment, safety and security (HES&S) goals, issues and workplace hazards. Every worker has the right and obligation to stop a job if HES&S issues are not addressed.
4. **MANAGEMENT** will support the workers' efforts through their actions and priorities to improve HES&S by providing training, seeking input, assisting in investigations and sharing lessons learned across the organization.
5. By **PREPARING to WORK SAFELY** and in an **ENVIRONMENTALLY SOUND MANNER** we will reduce the inherent risks in our activities to an acceptable level before an activity is undertaken.
6. **HES&S SUGGESTIONS** will be respectfully and thoughtfully considered and feedback will be returned.
7. Incidents and near misses will be **REPORTED and INVESTIGATED** appropriately to determine cause, effect and preventive measures.
8. We will **LEARN and IMPROVE** from our observations and mistakes by openly communicating and seeking meaningful changes.
9. Working safely and in an environmentally sound manner is an **INDIVIDUAL CHOICE** that each of us must be committed to make continuously without failure.
10. Working safely and in an environmentally sound manner is a **CONDITION of EMPLOYMENT.**

HES916 7/2011



## Life Critical Expectations

Understanding and applying all Health, Environment, Safety, and Security (HES&S) and Operating Procedures are requirements to work at Marathon locations. While every task must be evaluated to identify hazards and risks, certain tasks performed incorrectly have a higher probability of serious injury or fatality. As employees and contractors of Marathon Oil Company, **WE WILL...**

**WORK SAFELY** by planning the work, assessing hazards, minimizing risk and communicating the plan before beginning work.

Obtain and utilize Safe Work **PERMITS** and Procedures when conducting Hot Work, Confined Space Entry, and all other permit required work activities.

Isolate, de-energize, lock out and tag out all **ENERGY SOURCES** as required when performing work.

Protect ourselves and others by taking effective precautions whenever working from **ELEVATED** locations.

Conduct overhead **LIFTING** operations according to lifting procedures and industry standards.

Follow safe **DRIVING** practices and avoid distractions while operating any vehicle.

These Life Critical Expectations are in line with our aim of ensuring everyone who works at Marathon goes home safely. Failure to work safely and follow Marathon's procedures in accordance with these minimum expectations will result in disciplinary action.

HGS817 7/2011



## **4 ENVIRONMENTAL PERFORMANCE**

This section summarises Marathon Oil's offshore environmental performance for 2015.

### **4.1 OIL AND CHEMICAL SPILLS**

During 2015 there were no unplanned releases of oil.

There were two unplanned releases of chemicals totalling 2.0 tonnes.

- One unplanned release of subsea hydraulic fluid (HW443ND) totalling 1.01 tonnes took place on the Brae Alpha facilities. HW443ND is a water based hydraulic fluid. The cause of this incident was identified and remedial action has been taken.
- One unplanned release of subsea hydraulic fluid (HW443ND) totalling 0.99 tonnes took place on the East Brae facilities. Subsequent depressurisation of the hydraulic system and repressurisation rectified the problem.

It was considered that these accidental releases did not pose a significant environmental impact.

## 4.2 PRODUCED WATER

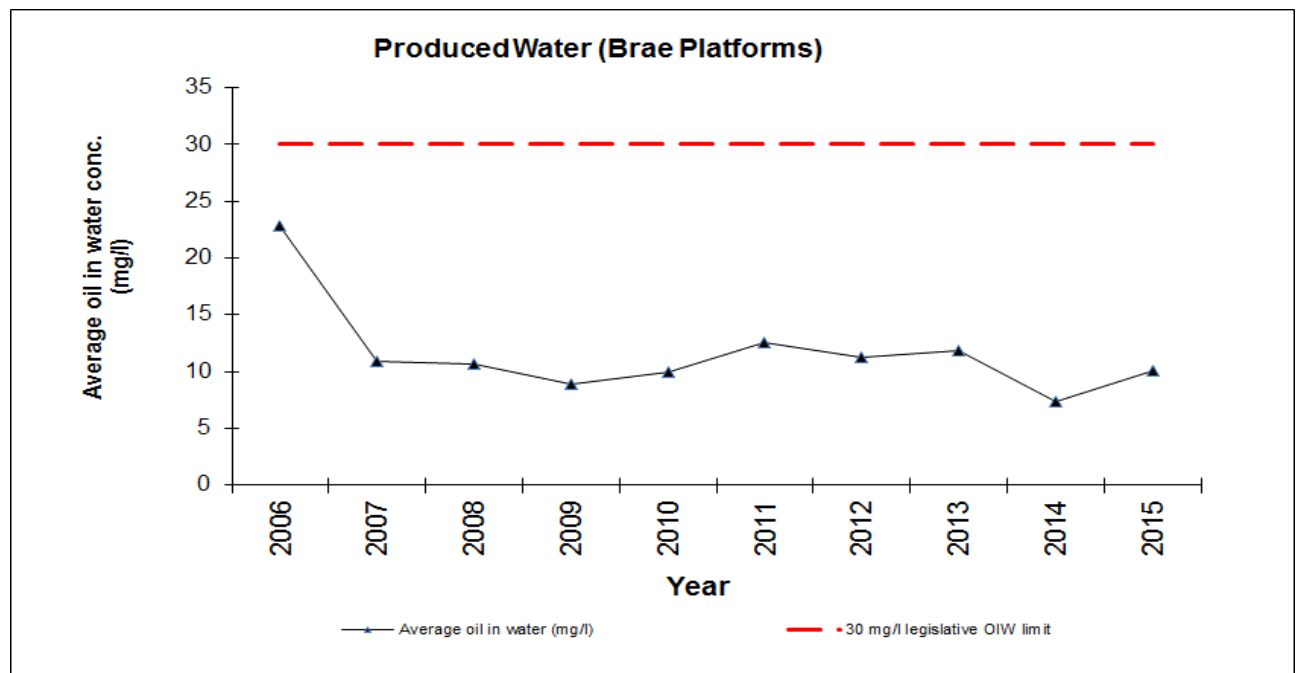
The discharge of produced water in the UK is regulated by the Offshore Petroleum Activities (Oil Pollution Prevention and Control) (Amended) Regulations 2011.

Marathon Oil continues to operate well below the legislative 30mg/l limit for concentration of oil in produced water discharged and has done so throughout the reporting period.

The average oil in water concentration for the Brae Field in 2015 was 10 mg/l. This represents a slight increase from 7 mg/l in 2014. This was mainly due to new West Brae wells coming online following a drilling programme and the return to production of the subsea Enoch well in Q4 following a shut in period of approximately four years.

In total, 2,625,100 m<sup>3</sup> of produced water and 26.6 tonnes of permitted oil was discharged in 2015, the largest producer being the Brae Alpha platform. This is due to the nature of the reservoirs that are produced to Brae Alpha which bring high produced water volumes.

The sharp decrease in oil concentration between 2006 and 2007 was due to the installation of new advanced produced water treatment facilities and a change in the oil in water analysis method prescribed by the regulator (DECC).



FACILITY	Average Oil in Produced Water concentration (mg/l)	Total Oil Discharged in Y2015 (Tonnes)	Total Produced Water Discharged in Y2015 (m <sup>3</sup> )
BRAE ALPHA	11.1	20.92	1,890,545
BRAE BRAVO	7.4	5.33	719,729
EAST BRAE	20.9	0.31	14,826
<b>TOTAL BRAE</b>	<b>10.1</b>	<b>26.57</b>	<b>2,625,100</b>

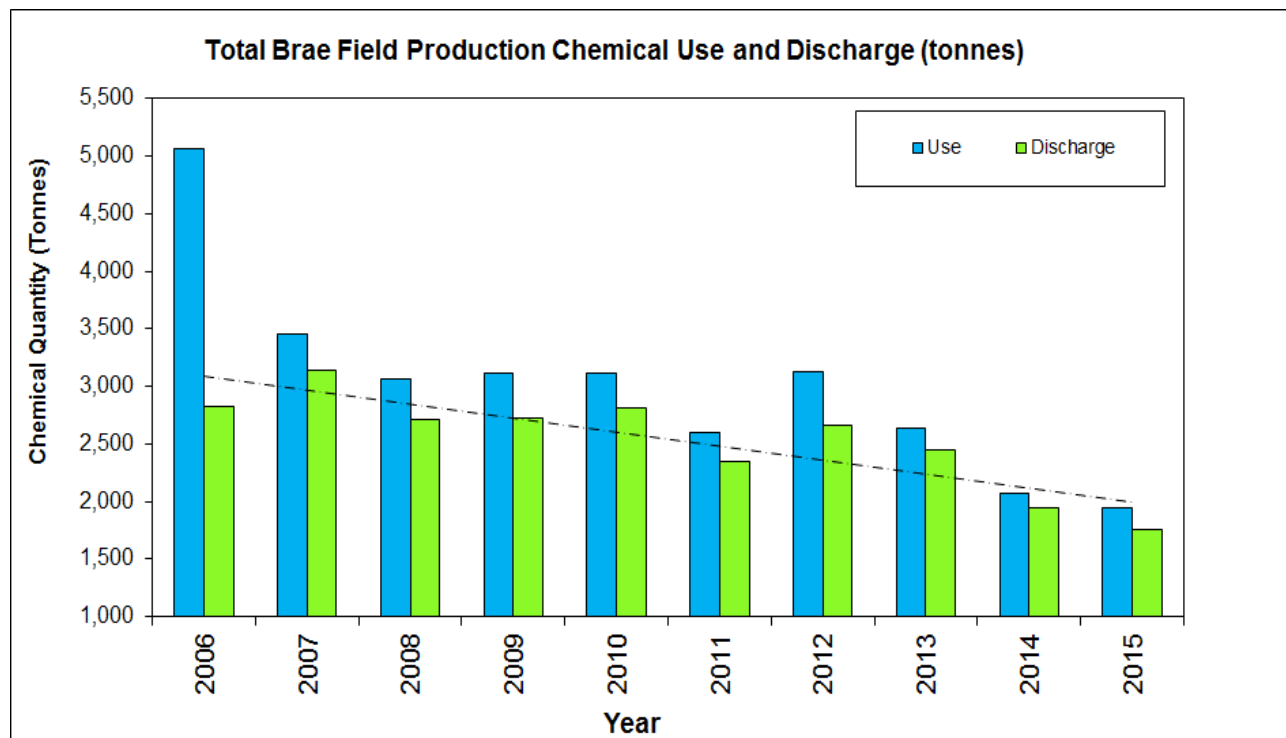
### 4.3 CHEMICAL USE AND DISCHARGE

The use and discharge of chemicals in the UK is regulated under the Offshore Chemical Regulations 2002 (amended 2011) and enforces a number of OSPAR requirements.

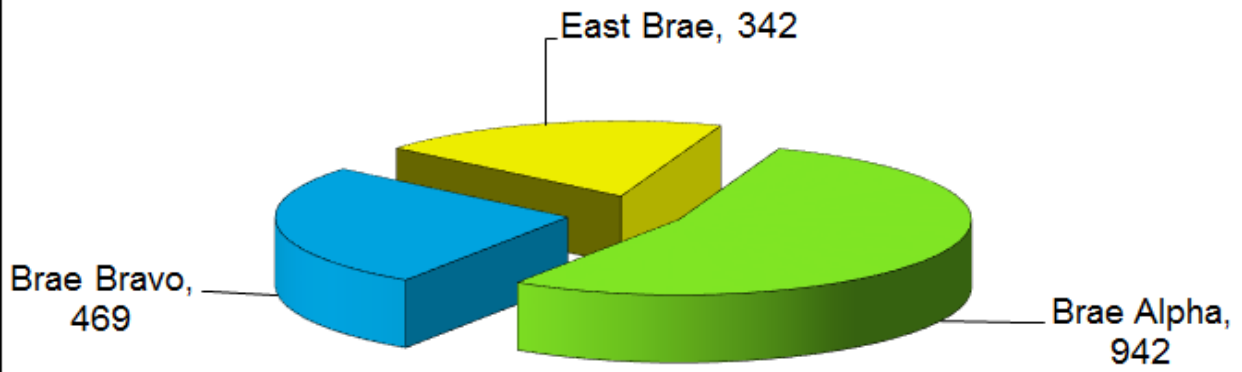
OSPAR recommendations require the phase out of any chemicals which carry substitution warnings, i.e. those chemicals that are considered to be harmful. Marathon Oil is committed to a programme of systematic reduction/removal of all chemicals carrying a substitution warning by the end of 2016 unless their use is required on technical and/or safety grounds. Over the last four years Marathon Oil has removed 19 chemicals carrying a substitution warning from the Brae Field chemical permits. Only 7% of the total quantity of chemicals discharged from the Brae platforms during 2015 carried substitution warnings.

The vast majority of chemicals used and discharged in the Brae Field (96%) fall within Offshore Chemical Notification Scheme (OCNS) categories Gold and E which are least hazardous to the environment.

Production chemical discharges in the Brae Field decreased by 10% in 2015 compared to 2014, despite a slight increase in cumulative produced water discharged for the year.



**Production Chemical Discharge by Platform in 2015  
(tonnes)**



FACILITY	Chemicals Used (Tonnes)	Chemicals Discharged (Tonnes)
BRAE ALPHA	1,080	942
BRAE BRAVO	500	469
EAST BRAE	369	342
<b>TOTAL BRAE</b>	1,950	1,753

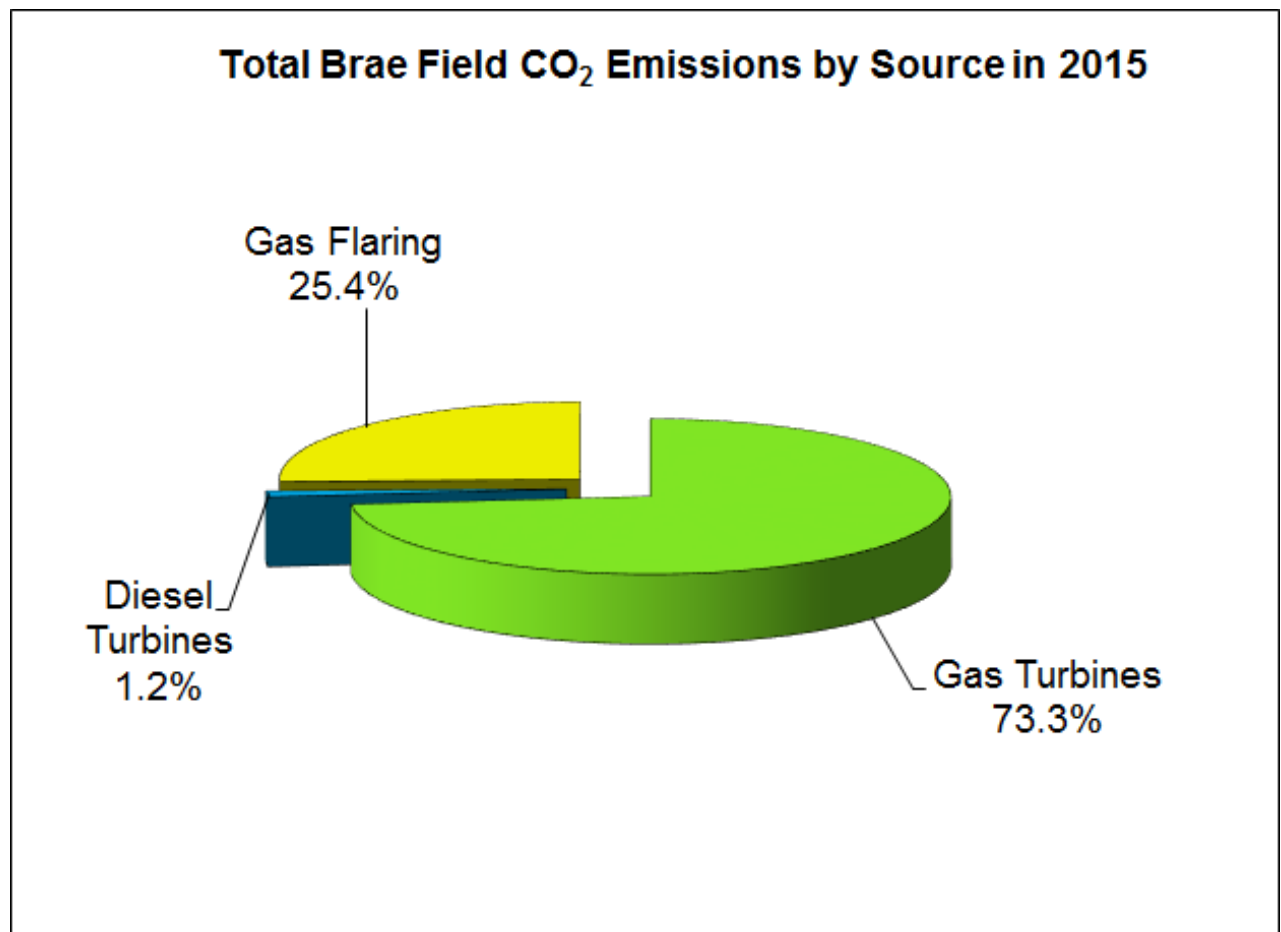
#### 4.4 CARBON DIOXIDE EMISSIONS

Carbon dioxide (CO<sub>2</sub>) is the largest atmospheric emission from the Brae Field, being produced by the combustion of natural gas and diesel and also from process gas flaring for safety purposes. The largest sources of these emissions are the gas turbines followed by the flares and these are regulated under “The Greenhouse Gas Emissions Trading Scheme and National Emissions Inventory (Amendment) Regulations 2013”.

A key energy efficient feature of the Brae Field is the power sharing ring main. Alpha and Bravo supply power to East Brae which allows the installation to have no energy generating facilities of its own thus improving the energy efficiency of the field overall.

In 2015 Marathon Oil continued to operate in an energy efficient manner by consolidating the energy efficient changes from 2009 onwards and by continuing to minimise the power requirements within the Brae Field using the power ringmain between the three platforms.

623,000 tonnes of CO<sub>2</sub> were emitted from the Brae platforms in 2015.



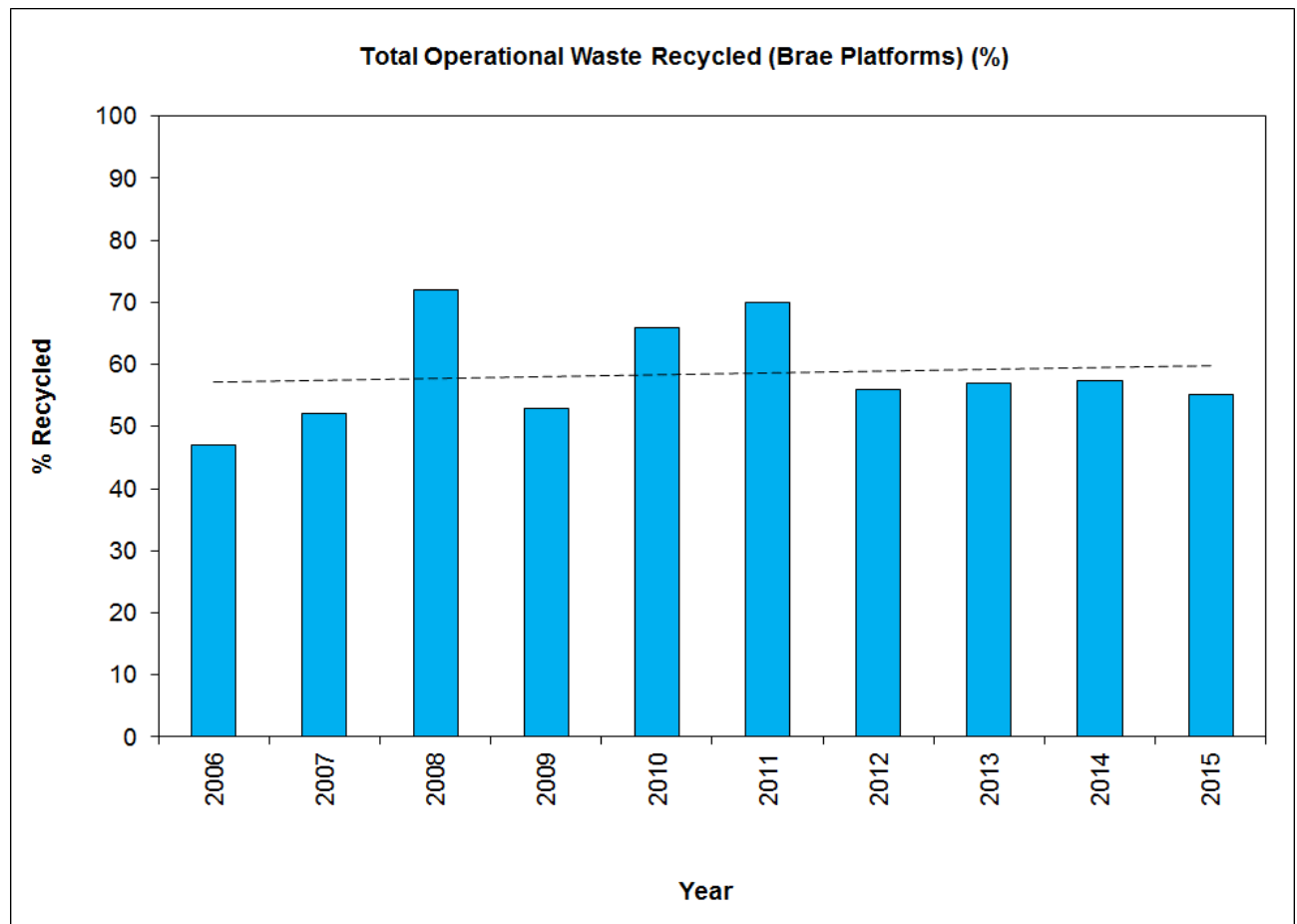
FACILITY	TOTAL CO2 EMISSIONS BY SOURCE		
	Gas Turbines (Tonnes)	Diesel Turbines (Tonnes)	Gas Flaring (Tonnes)
BRAE ALPHA	149,550	2,629	88,617
BRAE BRAVO	240,997	4,967	46,971
EAST BRAE	66,228	45	22,783
<b>TOTAL BRAE</b>	456,775	7,641	158,371

## 4.5 WASTE DISPOSAL

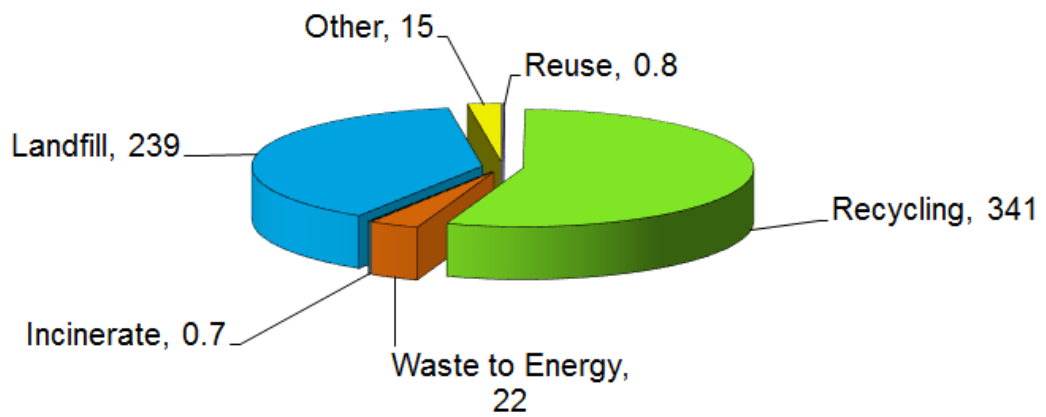
Marathon Oil's aim is to minimise waste produced and reduce dependence on landfill; as such there are robust arrangements in place for the segregation and management of these wastes. Waste is disposed of in line with the waste hierarchy.

Since 2012 waste produced across the Brae Field has remained relatively constant and during 2015 there has been a slight decrease in the percentage of waste recycled.

During 2015 Marathon Oil undertook quarterly onshore skip audits at the waste management contractor's yard to assess how well offshore personnel segregate waste to be sent to landfill. Overall performance continued to improve with 98% of waste produced being segregated correctly. These audits are useful in identifying the composition of the waste produced and opportunities for minimisation.



### Total Brae Field Operational Waste Disposal Routes in 2015 (Tonnes)



FACILITY	WASTE STREAMS						
	Reuse	Recycling	Waste to Energy	Incinerate	Landfill	Other	Totals
	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)
<b>BRAE ALPHA</b>	0.1	148.5	10.7	0.5	128.9	10.4	299.0
<b>BRAE BRAVO</b>	0.7	90.1	8.4	0.1	79.0	3.6	181.9
<b>EAST BRAE</b>	0.0	102.6	2.4	0.1	31.0	0.6	136.8
<b>TOTAL BRAE</b>	0.8	341.2	21.5	0.7	238.9	14.6	617.7