Environmental Performance Report 2021

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ALTERA INFRASTRUCTURE ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) ANNUAL PUBLIC STATEMENT

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Abbreviations

BEIS	Department for Business, Energy and Industrial Strategy
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CoP	Cessation of Production
EEMS	Environmental Emissions Monitoring System
EMS	Environmental Management System
EU ETS	European Union Emission Trading System
FPSO	Floating Production Storage and Offloading
HSSE	Health, Safety, Security and Environment
HSSEQ	Health, Safety, Security, Environment and Quality
H_2S	Hydrogen Sulphide
ISO	International Organization for Standardization
mg/l	Milligrams per Litre
NC	Non-Conformance
NOx	Nitrous Oxides
N_2O	Nitrogen Dioxide
OCR NCN	Offshore Chemical Regulations Non-Compliance Notification
OIW	Oil in Water
OPPC	Oil Pollution Prevention and Control
OSPAR	Oslo Paris Convention for the Protection of the Marine Environment of the-East Atlantic
PLANC	Permits, Licences, Authorisation, Notifications and Consents
PMCR	Produced Main Control Room
PON	Petroleum Operations Notice
PPC	Pollution Prevention and Control
PW	Produced Water
PWRI	Produced Water Re-injection
SICI	Scale Inhibitor Corrosion Inhibitor
SO2	Sulphur Dioxide
SUB	Chemicals Rated for Substitution
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
VOCs	Volatile Organic Compounds

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1 INTRODUCTION

This report is the 2021 Annual Public Statement for environmental management covering the United Kingdom Continental Shelf (UKCS) operations of Altera Infrastructure.

This document is prepared in line with the reporting requirements of the United Kingdom (UK) Department for Business, Energy and Industrial Strategy (BEIS) and meets the requirements of the Oslo Paris (OSPAR) Convention recommendations 2003/5. This report outlines Altera Infrastructure Offshore Environmental Management System (EMS) and details the 2021 environmental performance.

2 OVERVIEW OF NORTH SEA ASSETS

Petrojarl Foinaven

The Petrojarl Foinaven Floating Production System (FPSO) is the host installation of the Foinaven Field producing for BP. The Petrojarl Foinaven FPSO (Figure 2-1) is located 190 km west of the Shetland Islands, predominantly in Blocks 204/24a and 204/19, in a water depth of 480 m.

Figure 2-1 Petrojarl Foinaven FPSO

Sevan Hummingbird

The Sevan Hummingbird is a SEVAN 300 unit located in the Chestnut field, producing for Spirit Energy (Figure 2-2).

Discovered in 1986, the Chestnut oilfield is one of the oldest standalone oilfield developments in the North Sea. Production came online in September 2008, and in the first quarter of 2009, the Chestnut satellite field was tied into the newly installed Hummingbird FPSO. The Hummingbird is a cylindrical geo-stationary FPSO, the first of its kind to be utilised in the North Sea, designed around a hexagonal shaft with a cargo storage capacity of 300,000 barrels. The FPSO's topside provides accommodation for 47 crew members. Tanks for diesel and fresh water and utility equipment are situated beneath the accommodation. Seawater is injected to maintain reservoir pressure, and produced fluids are received from two risers before fluids are separated and produced water treated and discharged directly into the sea. Oil is routed to Cargo tanks and periodically offloaded via shuttle tanker.

Figure 2-2 Sevan Hummingbird FPSO

3 ENVIRONMENTAL MANAGEMENT SYSTEM

3.1 HSSEQ Policy

Altera Infrastructure's commitment to the environment, as well as health, safety and security, are detailed within its policy statement, shown in Figure 3-1. The Health, Safety, Security, Environment and Quality (HSSEQ) policy is a public commitment to conducting business in a manner that protects the health and safety of people and preserves the integrity of the environment.

The main commitments of the policy are:

- Providing a safe working environment with no harm to personnel;
- Achieving our goal of zero incidents with major accident potential;
- Preventing spills and minimising our environmental footprint; and
- Meeting or exceeding all applicable HSSEQ legislation and regulatory requirements.

3.2 EMS

Altera Infrastructure's commitment to the highest levels of HSSE is achieved through the HSSEQ Management System, which contains an EMS utilised to identify, assess and mitigate environmental risks and mange environmental performance of all its operations.

The EMS is an integral element of the HSSEQ Management System and is based on the principle, "plan, do, check and act". The EMS is designed to achieve the environmental goals of the prevention and elimination of pollution from offshore sources, the protection and conservation of the maritime area against other adverse effects of offshore activities and the continual improvement in environmental performance. Altera Infrastructure produces an annual Sustainability Report which includes the status of its environmental performance.

The EMS is verified against the International Organization for Standardization (ISO) 14001 Standard for EMS and includes all their North Sea assets. Altera Infrastructure ensures maintenance and compliance with ISO 14001 (Figure 3-2). Environmental compliance is also managed through the development of an asset specific Permits, Licences, Authorisations, Notifications and Consents (PLANC) Register and an Environmental Compliance Plan.

altera
INFRASTRUCTURE

Global HSSEQ Policy

Our commitments to Health, Safety, Security, Environment, and Quality ("HSSEQ") are directly linked to the long-term success of Altera Infrastructure. It is our vision to lead the offshore energy industry to a sustainable future and our policy is to incorporate a strong risk and opportunity-based approach to HSSEQ in our strategic and daily decisions.

We are committed to:

- Providing a safe and healthy working environment with no harm to personnel
- Achieving our goal of zero incidents with major accident potential
- Protecting the environment by preventing pollution
- Minimizing our environmental footprint
- Delivering operational excellence every day by living our TEAM values
- Meeting or exceeding all applicable HSSEQ legislation and regulatory requirements

To meet our commitments, we:

- Ensure HSSEQ is a line responsibility
- Systematically manage health, safety, security, and environmental risks through elimination of hazards
- Actively engage with our employees and their representatives
- Continuously improve our processes and performance
- Prioritize our HSSEQ commitments in strategic and daily decisions
- Empower everyone to stop work where safety is at risk
- Manage hazards to prevent major accidents
- Engage in the innovation of environmentally friendly technology
- Promote ethical and compliant decision-making
- Only engage with business partners and suppliers who share our approach to HSSEQ

If there are discrepancies between the English version of this Policy and any translated version, the English version will prevail.

Ingvild Sæther

INGVILD SÆTHER
President & Chief Executive Officer
Altera Infrastructure Group Ltd.

June 2021

Figure 3-1 Altera Infrastructure HSSEQ Policy

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 174287-2015-AE-NOR-NA
Initial certification date: 28 December 2004
Valid: 14 March 2021 – 13 March 2024

This is to certify that the management system of

Altera Infrastructure Production AS

Brattørkaia 17A, 7010 Trondheim, Norway

and the sites and vessels as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:

ISO 14001:2015

This certificate is valid for the following scope:

Activities on- and offshore, to operate FPSO's.

Place and date:
Høvik, 10 March 2021

NORWEGIAN ACCREDITATION
MSVS 002

For the issuing office:
DNV - Business Assurance
Veritasveien 1, 1363 Høvik, Norway

Jøran Laukholm
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV Business Assurance Norway AS, Veritasveien 1, 1363 Høvik, Norway - TEL: +47 67 57 99 00. www.dnvgl.com/assurance

Figure 3-2 Altera Infrastructure ISO14001 certificate

4 ENVIRONMENTAL PERFORMANCE

Altera Infrastructure has identified the following significant environmental aspects of its operations:

- Atmospheric emissions;
- Oil and sand discharges to sea in produced water;
- Chemical use and discharge to sea;
- Solid waste generation and disposal; and
- Oil and chemical spills.

Altera Infrastructure routinely monitors and reports its performance in terms of environmental emissions and discharges as required by UK legislation and the internal HSSEQ Management System. This information is reported via the Environmental and Emissions Monitoring System (EEMS), which is a database of environmental information that is accessible to oil and gas operators and to the regulator, BEIS.

4.1 Petrojarl Foinaven

Environmental data for the Petrojarl Foinaven FPSO is presented for the period of only January 2021 to April 2021, as a result of Cessation of Production (CoP).

4.1.1 Water and Oil in Water Discharges

Water discharges are monitored and reported in accordance with the Oil Pollution Prevention and Control (OPPC) Permit.

The average Oil in Water (OIW) concentration for the main discharge route (Produced Water Flash Drum) was 56.3 mg/l, which is above the permitted 30 mg/l limit. Details of non-conformances are provided in Section 5. A produced water volume of 225,770 m^3, and 12,587 kg of oil, was discharged during the year (Figure 4-1).

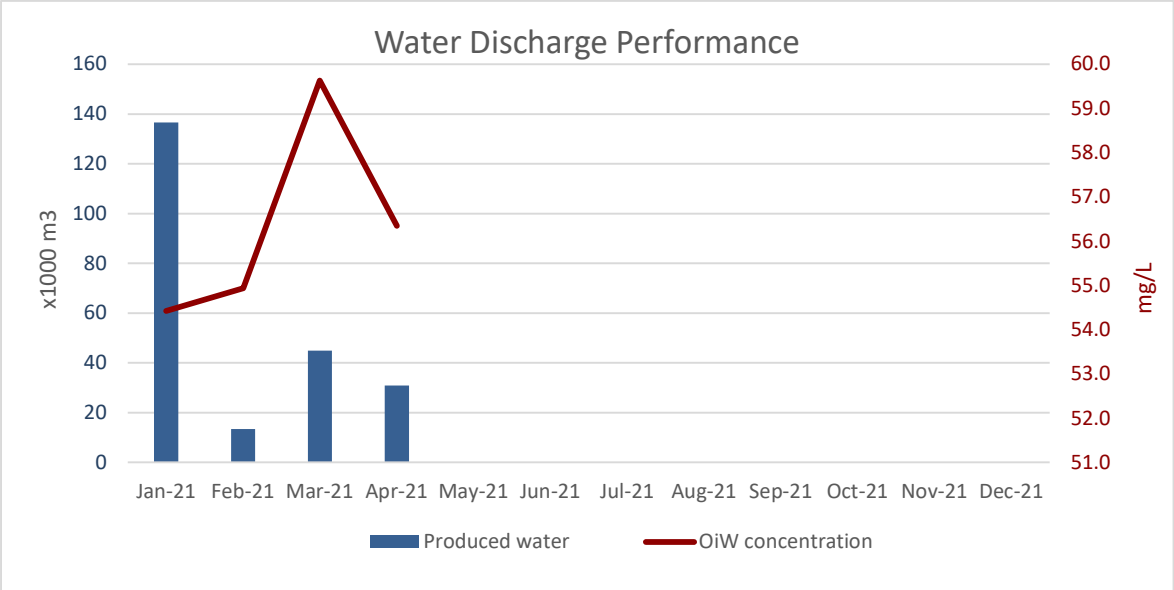

Figure 4-1 Petrojarl Foinaven Water Discharge Performance

4.1.2 Chemical Use and Discharge

The data shows that chemical use in 2021 was 1,640 tonnes and the percentage of these chemicals that may have been discharged was 10.6%. All individual chemical usages/discharges were within approved limits (Figure 4-2), apart from WAX and TAR Remover EF, FIS as the total volume used was 427.2 kg against a total permit allowance of 332.4 kg.

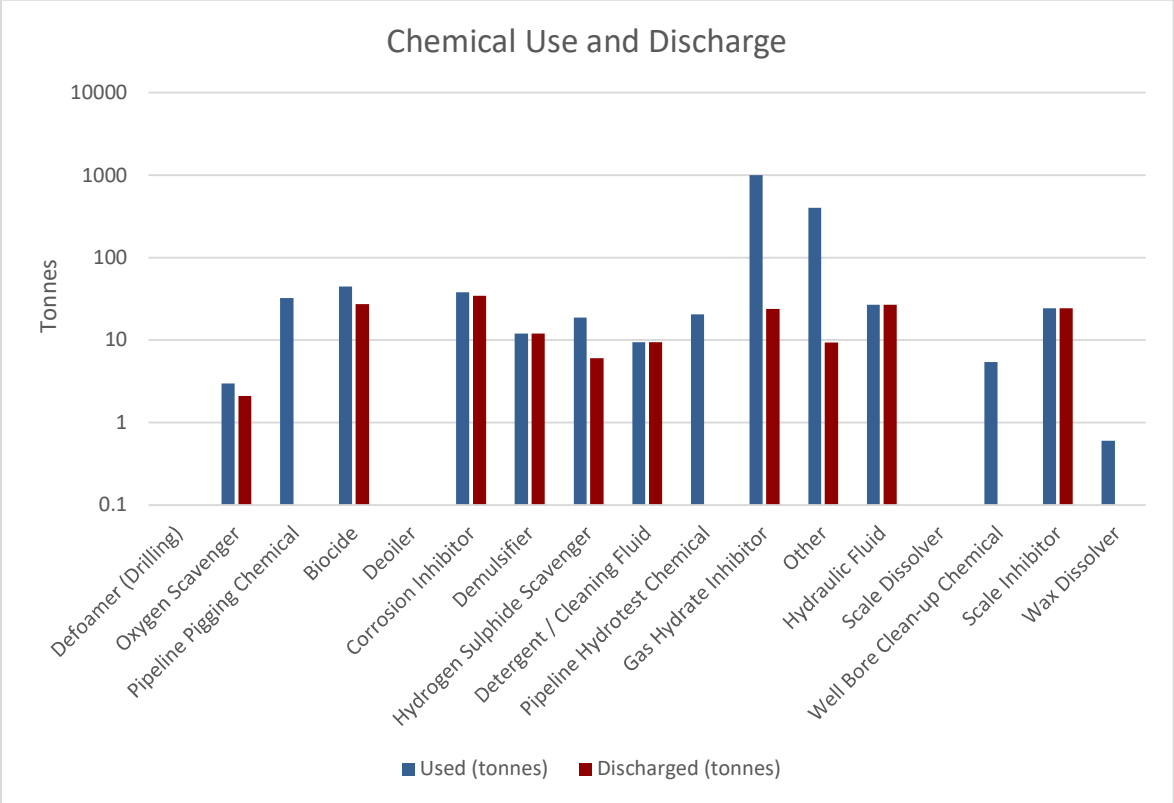

Figure 4-2 Petrojarl Foinaven Chemical Use and Discharge

The majority of chemicals in use on the Petrojarl Foinaven FPSO do not have a substitution (SUB) warning (see Figure 4-3). Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

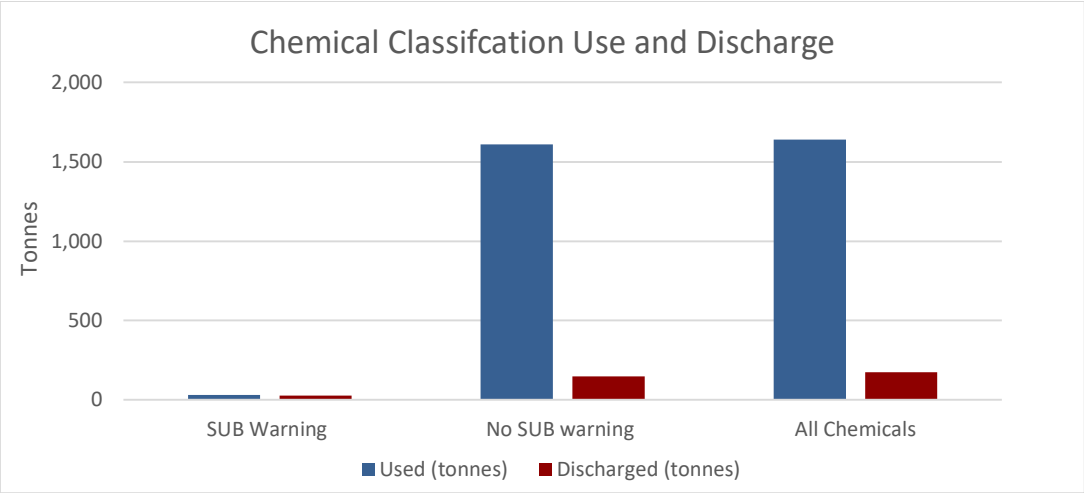

Figure 4-3 Petrojarl Foinaven Chemical Use and Discharge - Chemicals with Substitution Warning Label

4.1.3 Atmospheric Emissions

The primary source of carbon dioxide (CO_2) emissions from Petrojarl Foinaven FPSO is diesel, which supplies power generation (Figure 4-4). Note the field operator, BP, is responsible for managing the flare consent and EU ETS permit associated with the Foinaven fields.

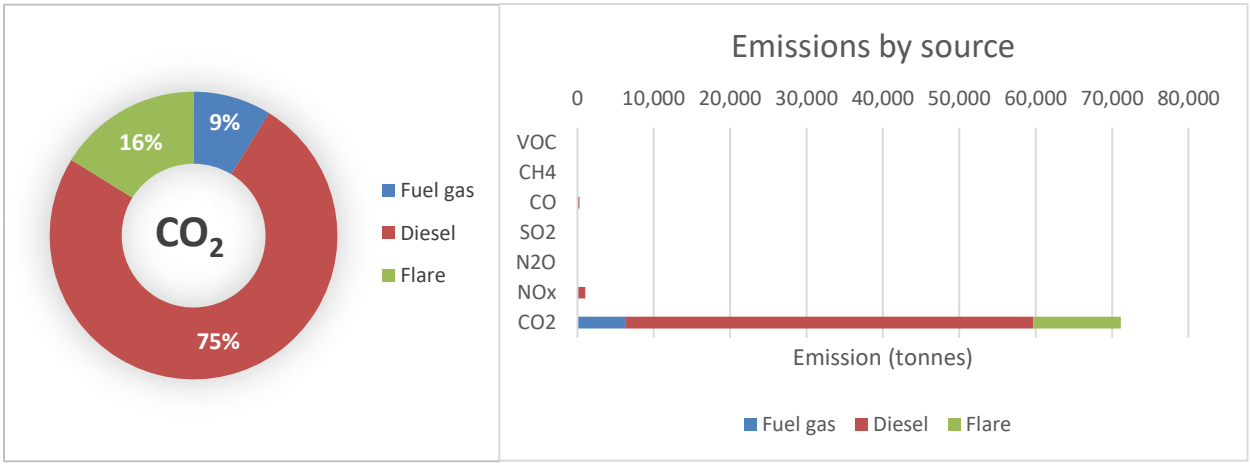

Figure 4-4 Petrojarl Foinaven Emissions

4.1.4 Waste Management

The Petrojarl Foinaven FPSO generated 364.5 tonnes of waste which was segregated into the following disposal routes (Figure 4-5).

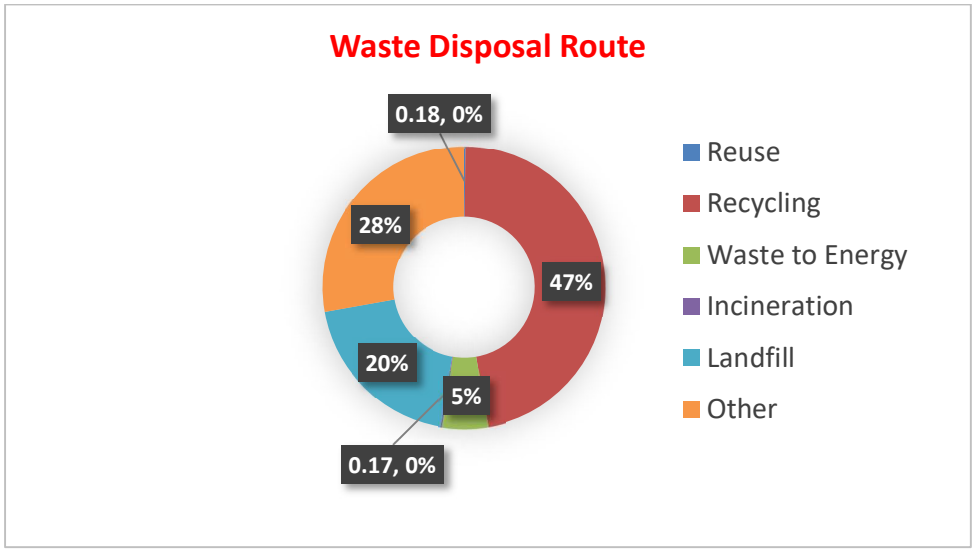

Figure 4-5 Petrojarl Foinaven Waste Disposal Route Breakdown

4.2 Sevan Hummingbird

Environmental data for Sevan Hummingbird is presented for the period January 2021 to December 2021.

4.2.1 Water and Oil in Water Discharges

Water discharges are monitored and reported in accordance with the OPPC Permit.

The average OIW concentration for the period was 21.15 mg/l, which is below the permitted 30 mg/l limit. A produced water volume of 633,758 m^3 and 13,405 kg of oil was discharged during the year (Figure 4-6).

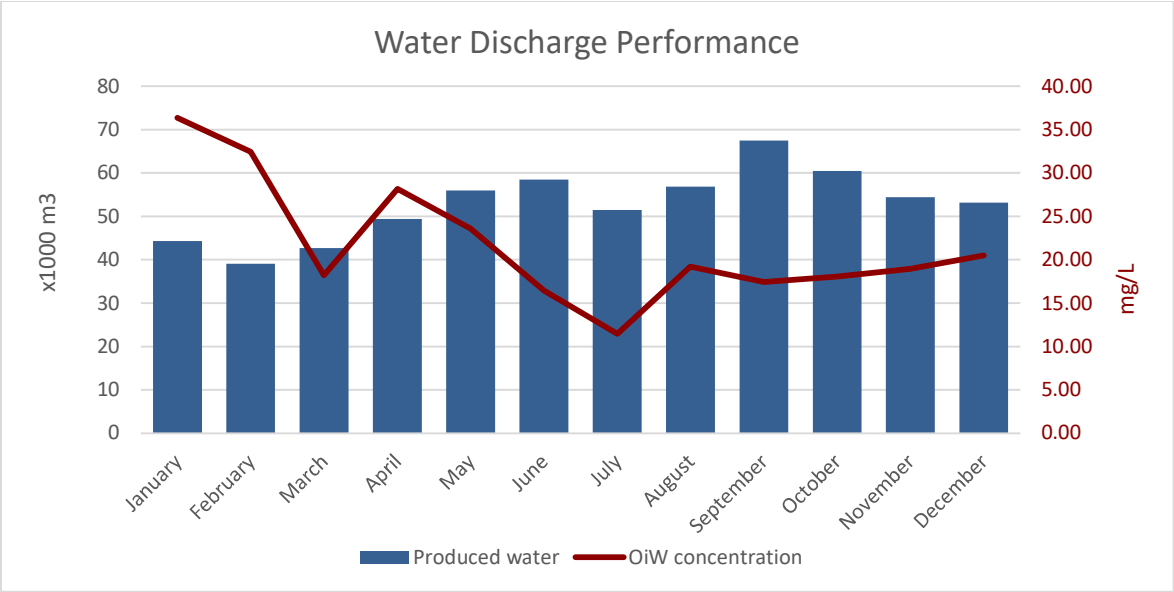

Figure 4-6 Sevan Hummingbird Water Discharge Performance

4.2.2 Chemical Use and Discharge

The data shows that chemical use in 2021 was 273.79 tonnes and the percentage of these chemicals that may have been discharged was 92 % (Figure 4-7).

All individual chemical usages/discharges were within approved limits, apart from SICI1000A, SCAL1110A and CLAR13281A during March. This was due to a fault with the Produced Water (PW) meters which meant that the chemicals were applied at concentrations greater that those allowed under the terms of the Hummingbird Chemical permit. Greater chemical concentrations than permitted also occurred in May, which was the result of an automated alarm that stops pump operation failed to activate resulting in an over application of biocide MB-5028.

Both were reported to BEIS as Offshore Chemical Regulations Non-Compliance Notifications (OCR NCN).

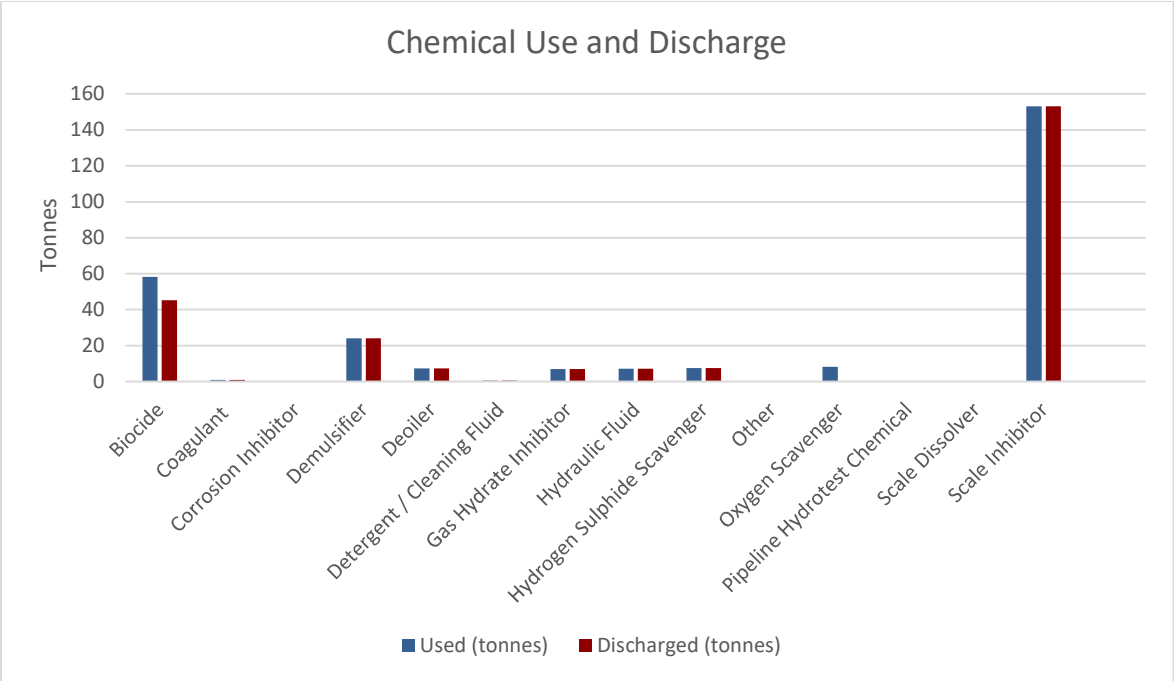

Figure 4-7 Sevan Hummingbird Chemical Use and Discharge

The majority of chemicals in use on the Sevan Hummingbird FPSO have a substitution warning (Figure 4-8). Ongoing chemical management aims to continue to minimise the impact of chemicals on the environment.

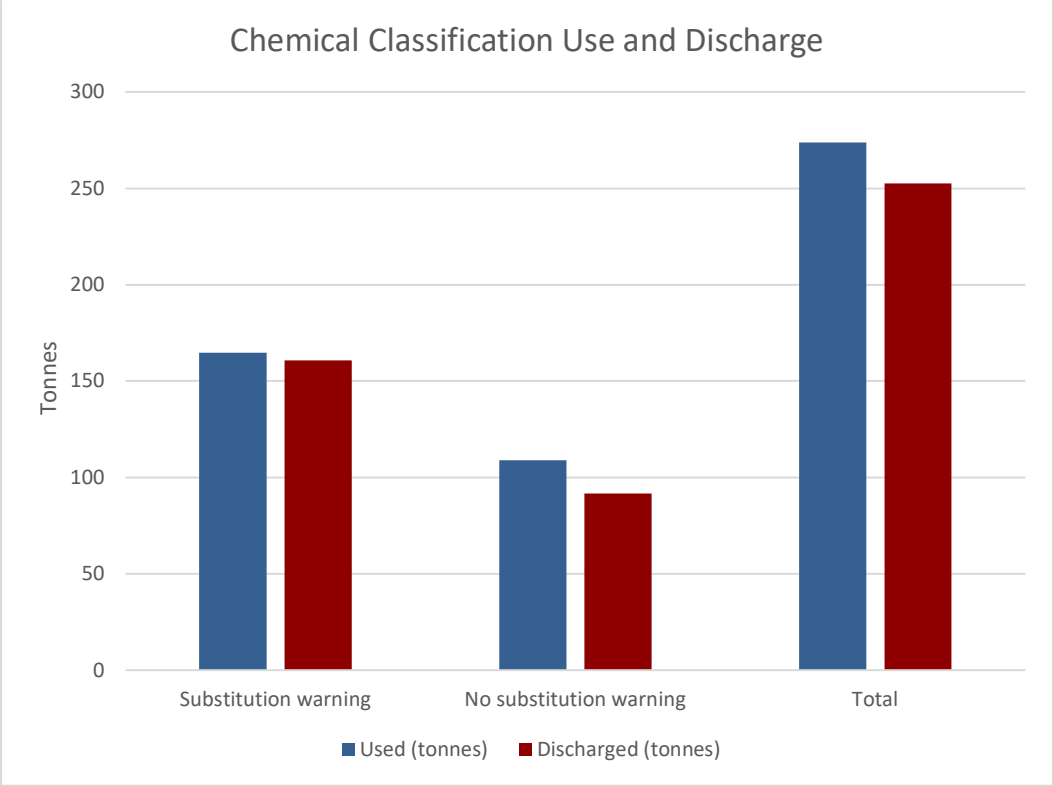

Figure 4-8 Sevan Hummingbird Chemical Use and Discharge - Chemicals with Substitution Warning Label

4.2.3 Atmospheric Emissions

The primary source of CO_2 emissions from the Sevan Hummingbird FPSO is flaring (see Figure 4- 9), for which Spirit Energy hold the Flare Consent. This is followed by fuel gas and diesel use. Combustion plant on the Sevan Hummingbird FPSO falls below the regulatory reporting thresholds and therefore there is no Pollution Prevention and Control (PPC) permit.

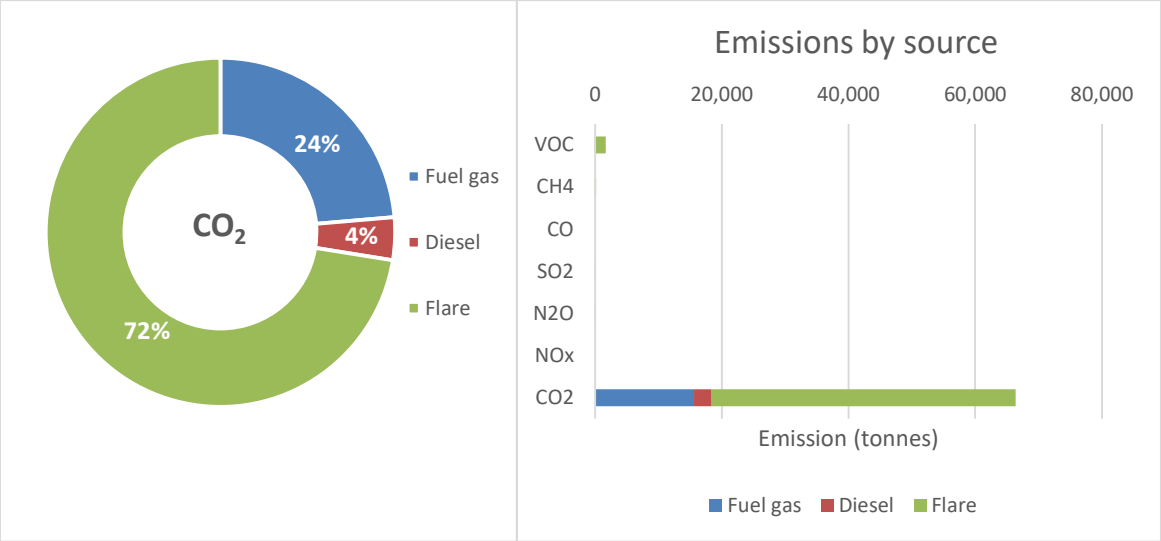

Figure 4-9 Sevan Hummingbird Emissions

4.2.4 Waste Management

The Sevan Hummingbird FPSO generated 50.87 tonnes of waste which was segregated into the following disposal routes (Figure 4-10).

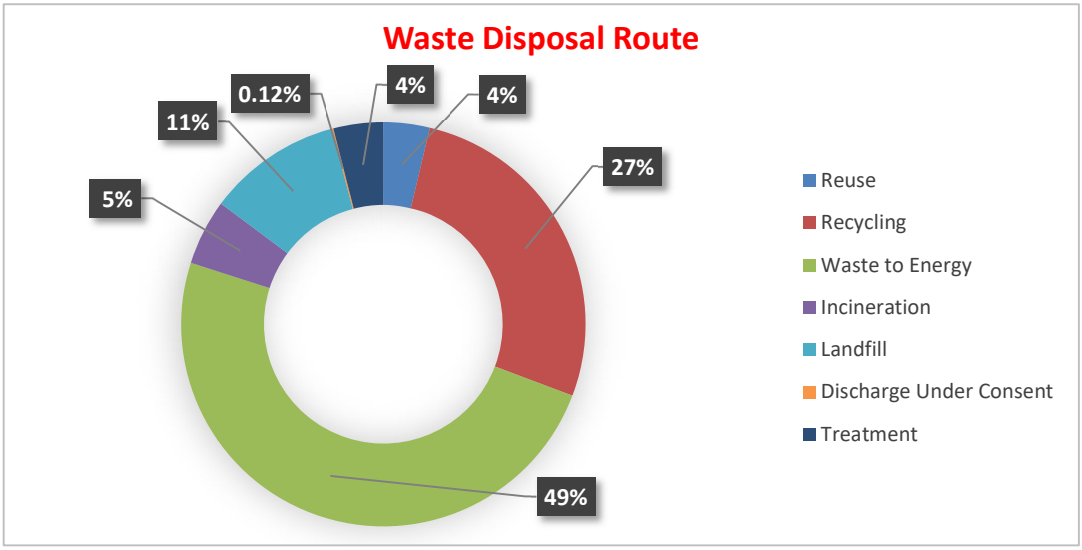

Figure 4-10 Sevan Hummingbird Waste Disposal Route Breakdown

5 INCIDENTS

The reportable incidents that occurred during 2021 are presented in Table 5-1. Most non-conformances are associated with breaching monthly or daily OIW limits on the Petrojarl Foinaven and Sevan Hummingbird assets. There is on-going work to improve this on the Sevan Hummingbird, mainly involving improved chemical management such as replacing current chemicals with alternate ones which impact less on the discharged water quality.

Table 5-1 2021 Reportable Incidents

Date of Report	Asset	Non-Conformance Type	Description
01/01/2021	Hummingbird	OPPC Non-Conformance	Monthly OiW >30 mg/L There has been a build-up of 35,000 bbls slops water onboard due to weather, sand, squeeze flowback to slops and subsea Scale inhibitor Corrosion Inhibitor (SICI) chemical flowback to slops. This has meant that Hummingbird has been processing slops to reduce the overall quantity onboard which in turn has had an impact on the OIW performance.
01/01/2021	Foinaven	OPPC Non-Conformance	Monthly average OIW > 30 mg/l (54.34 mg/l) due to the Produced Water Re-injection (PWRI) system being offline across 24 days in the month of January. Exceedance occurred on the 1st to 5th January (5 Days).
01/02/2021	Foinaven	OPPC Non-Conformance	Monthly average OIW > 30 mg/l (54.93 mg/l) due to the PWRI system being offline across 5 days in the month of February 2021.
01/02/2021	Hummingbird	OPPC Non-Conformance	Monthly OiW >30 mg/L due to an issue with slops processing, the high volumes of cargo water onboard and H_2S risks associated with not processing the slops. This has meant that Hummingbird has been processing slops to reduce the overall quantity onboard which in turn has had an impact on the OIW performance.
01/03/2021	Foinaven	OPPC Non-Conformance	Monthly average OIW > 30 mg/l (59.63 mg/l) due to the PWRI system being offline across 9 days in the month of March 2021. Exceedance occurred on the following dates: 1st to 5th March (5 Days), 7th & 8th March (2 Days), 29th & 30th March (2 Days)
26/03/2021	Hummingbird	Offshore Chemical Regulations	Chemical dosages higher than permitted.

Date of Report	Asset	Non-Conformance Type	Description
		(OCR) Regulations Non-Conformance	After issues occurred with the incumbent PW flow meter discussed below, it was identified between 25-12-20 and 17-3-21 the following chemicals were applied at concentrations greater that those allowed under the Hummingbird Chemical permit: • SICI1000A from 25-12-20 through to 18-03-21 (maximum permitted dose is 163.8 mg/L and due to PW mismeasurement consistent application of this chemical was 15-20% higher than this) • SCAL1110A from 25-12-20 through to 17-03-21 (maximum permitted dose is 13 mg/L and due to PW mismeasurement consistent application of this chemical was 15-20% higher than this) • CLAR13281A from 25-12-20 through to 09-02-21 (maximum permitted dose is 13.6 mg/L and due to PW mismeasurement consistent application of this chemical was 15-20% higher than this).
30/04/2021	Foinaven	OPPC Non-Conformance	Monthly average OIW > 30 mg/l (56.34 mg/l) due to the PWRI system being offline across 6 days in the month of April 2021. Missing chemical use/discharge data from the Q1 EEMs return (PermProd). Missing figures for Q1-2021 for the following chemicals (All non-production ones): Hydrosure HD-5000 (DTI ID: 24858), Rustex DC (DTI ID: 24611), RX-8046 HYDROCARBON CLEANER (DTI ID: 25736), RX-9022 (DTI ID: 4579), STS001 (DTI ID: 26246), Super-Solv (DTI ID: 4232) WAX AND TAR REMOVER EF (DTI ID: 26683).
20/05/2021	Hummingbird	Offshore Chemical Regulations (OCR) Regulations Non-Conformance	Chemical dosages higher than permitted On the 19/05/21 during biociding operations of the slops water tanks containing high levels of produced water following adverse weather, an automated alarm that stops pump operation failed to activate resulting in an over application of biocide MB-5028.
22/05/2021	Hummingbird	OPPC Non-Conformance	Degasser malfunction

Date of Report	Asset	Non-Conformance Type	Description
			OPPC NC was submitted as Altera had been under reporting the volume of PW due to the malfunction on the degasser LCV 0431, which was affecting the PW flow meter readings. Following investigation, the issue was resolved, and below is a summary of the final outcome. Altera have moved the transducers to locations that now provide accurate flow rates. Altera have also created Produced Main Control Room (PMCR) to move across pumps and transducers once every two months, running for 48 hours which allows us to carry out a metering calibration check and if any issues are identified then Altera will mobilise the ABLE clamp on meter to verify accuracy.
July 2021	Foinaven	PON 1	Discharge of oily water through the open overboard block valve and discharged to sea with a total oil volume of 0.006140789 tonnes. Breached the permitted usage allowance of WAX and TAR Remover EF, FIS. Total volume used was 427.2 kg against a total permit allowance of 332.4kg.
01/09/2021	Hummingbird	OPPC Non-Conformance	Late submission of EEMS return

6 CONCLUSIONS

Altera Infrastructure is committed to minimising impacts to the environment from offshore operations. Through the regular review of environmental performance, and the setting and delivery of environmental objectives that are appropriate to environmental risks, Altera Infrastructure shall continue to improve environmental performance.

Altera Infrastructure plans to deliver the following key environmental objectives in 2022:

- Raise environmental awareness on all the assets;
- Reduce the likelihood of accidental discharges to the sea and
- Ensure compliance with environmental regulations.