

Implementation of OSPAR Recommendation 2006/3 on environmental goals for the discharge by the offshore industry of chemicals that are, or which contain substances identified as candidates for substitution Implementation of OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution – 2022

OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

Contents

С	onter	nts	. 3
E	xecut	tive Summary	.4
R	écapi	itulatif	. 4
1	. In	ntroduction	. 5
	1.1	OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02	.5
	1.2	Implementation reporting	. 5
2.	. 0	verview of compliance	. 5
3	. Ef	ffectiveness of reporting	. 6
	3.1	Candidates for substitution that have been substituted	.6
	3.2 is cu	Candidates for substitution where the relevant regulatory authority is satisfied that there urrently no suitable alternative, including justification	.7
	3.3	Measures taken to reduce use or discharge of chemicals with no suitable alternative	.8

Annex 1: Denmark Implementation Report Annex 2: Ireland Implementation Report Annex 3: Netherlands Implementation report Annex 4: Norway Implementation Report Annex 5: United Kingdom Implementation Report Implementation of OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution – 2022

Executive Summary

This document provides an overview of implementation of OSPAR Recommendation 2006/03 as amended by OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge of the Offshore Industry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution and the effectiveness of reporting.

National implementation reports have been received from Denmark, Ireland, the Netherlands, Norway and the United Kingdom. These reports are included as annexes. Germany and Spain have no discharging offshore installations and therefore have not submitted their national implementation report.

Progress has been made in reducing the use and discharge of chemicals identified as candidates for substitution since the adoption of OSPAR Recommendation 2006/03, although phase-out has not been achieved. The Offshore Industry Committee recognises that more needs to be done to reduce discharges of chemicals identified as candidates for substitution and the OSPAR Recommendation 2006/03 as amended by OSPAR Recommendation 2019/02 sets a new deadline to phase out by 1 January 2026.

Récapitulatif

Ce document donne une vue d'ensemble de la mise en œuvre, et de l'efficacité de la notification, de la Recommandation OSPAR 2006/03, telle qu'amendée par la Recommandation OSPAR 2019/02, sur les objectifs environnementaux visant les rejets, par l'industrie de l'offshore, de produits chimiques qui sont ou qui contiennent des substances ayant été identifiées comme étant candidates à la substitution.

Des rapports nationaux ont été reçus du Danemark, de l'Irlande, des Pays-Bas, de la Norvège, et du Royaume-Uni. Ces rapports se trouvent en annexe. L'Allemagne et l'Espagne ne possèdent pas d'installations offshore qui rejettent en mer et n'ont donc pas soumis de rapport national de mise en œuvre.

Des progrès ont été réalisés pour réduire l'utilisation et le rejet de produits chimiques identifiés comme candidats à la substitution depuis l'adoption de la Recommandation OSPAR 2006/03, bien que l'élimination progressive n'ait pas été atteinte. Le Comité industrie de l'offshore reconnaît qu'il faut faire davantage pour réduire les rejets de produits chimiques identifiés comme candidats à la substitution, et la Recommandation OSPAR 2006/03 telle qu'amendée par la Recommandation OSPAR 2019/02 fixe une nouvelle date limite pour l'élimination progressive au 1er janvier 2026.

1. Introduction

1.1 OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02

The purpose of OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02 is to set an environmental goal for the discharge of offshore chemicals that are, or which contain substances identified as candidates for substitution, in order to move towards the cessation of these discharges from offshore installations.

The Recommendation applies to Contracting Parties which have offshore installations under their jurisdiction in their internal waters or territorial sea, or on their continental shelf.

1.2 Implementation reporting

Reports on the implementation of this Recommendation should be submitted by Contracting Parties with offshore installations that make discharges, using as far as possible the format set out in Appendix 1.

The reports should be submitted to the appropriate OSPAR subsidiary body by 31 January 2022 and every three years thereafter, unless otherwise specified by the Commission.

In their implementation reports, Contracting Parties should confirm:

- a. the candidates for substitution included in their national list that have been substituted;
- b. the practicability, efficacy, cost and environmental impact of offshore chemicals that are being discharged as alternatives to specific candidates for substitution included in their national lists; and
- c. details of those candidates for substitution where, despite considerable efforts, it has not been feasible for technical or safety reasons to phase out the discharge, including a justification for the continued discharge; a description of the efforts made to phase out the discharge; and any related measures taken to reduce the discharge of the candidate for substitution including the development of alternative substances or technical solutions.

2. Overview of compliance

OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02 requires Contracting Parties with discharging offshore installations to submit implementation reports to the Secretariat by 31 January 2022, and every three years thereafter.

The responses received from Contracting Parties were as follows:

Implementation of OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution – 2022

Table 1: Overview of the implementation and associated reporting on OSPAR Recommendation 2006/3 asamended by OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the OffshoreIndustry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution.

Means of implementation						
Contracting Party	Report available	Year of report ¹	Reservation	Legislation	Administrative action	Negotiated agreement
Denmark	Yes	2022	no	no	yes	no
Germany	No*					
Ireland	Yes	2022	no	no	yes	no
The Netherlands	Yes	2020	no	yes	no	no
Norway	Yes	2020	no	yes	yes	No
Spain	No*					
United Kingdom	Yes	2020	no	no	yes	yes

*No discharging offshore facilities, and therefore no requirement for an implementation report

All Contracting Parties that have provided implementation reports have implemented the Recommendation. No Contracting Party has exercised a reservation and the measure is therefore applicable to all Contracting Parties with discharging offshore facilities.

3. Effectiveness of reporting

3.1 Candidates for substitution that have been substituted

Some Contracting Parties have indicated that several candidates for substitution have been phased out.

Denmark has reported that two offshore chemical products containing candidates for substitution have been phased out by end of 2021 and are no longer in use by the operators.

Ireland has reported that no candidates for substitution are being discharged in Irish waters. As part of the decommissioning of three gas fields, there has been small operational discharges of a residual offshore chemical containing candidates for substitution. An application by the operator for consent to leave in place pipelines and umbilicals, which contain residual quantities of this substance, is under consideration by the regulator. Prior to disconnection of subsea umbilicals during the decommissioning operations the operator recovered as much of the control umbilical contents as possible.

The Netherlands compiles the number of candidate for substitution offshore chemical products and substitutable substances permitted for use and discharge according to the Harmonised Mandatory Control Scheme (HMCS) category. The Netherlands report in Annex 3 shows the downward trend in the number of

¹The Danish results are from 2021. The Norwegian reported data is from 2020. The report from the Netherlands and the United Kingdom relates to the period 2010-2020 and focusses on 2020.

products which are candidates for substitution and substitutable substances used and discharged between 2010 and 2020.

Norway has stated that the choice and ranking of chemicals, their environmental and substitution assessment are the responsibility of the operators in Norway. Therefore, no complete list of all substituted chemicals is available for the Norwegian Environment Agency (NEA). Plans and status for substitution of chemicals are reported in the operator's annual reports but collecting information about individual products is time-consuming. A list of candidates for substitution has been provided by Norway.

The United Kingdom compiles the number of candidate for substitution offshore chemical products permitted for use and discharge each year into three categories: phased-out completely; not phased out for some functions, applications and/or locations; or not phased-out. In total 255 substitutable substances have been reported as being phased out completely between 2010 and 2020. In 2020, 220 candidate for substitution offshore chemical products were included on a chemical permit for discharge on the UK Continental Shelf (UKCS). One or more operators reported that of the 220 offshore chemicals discharged, 26 were phased-out completely; therefore 194 offshore chemical products could be expected to be discharged in the future. Out of the 194, 28 were phased-out for some, functions, applications and/or locations and 166 were not phased-out. Further details can be seen in the UK report in Annex 5.

3.2 Candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification

Subject to a suitable justification, all reporting Contracting Parties have indicated that they will continue to permit the use of products that are, or contain, substances identified as candidates for substitution. Denmark, Norway and the United Kingdom have provided a list of candidates for substitution that currently have no suitable alternative. Denmark and the United Kingdom have provided details of each candidate for substitution where it has not been feasible for technical or safety reasons to phase out the discharge.

Denmark has reported 21 candidates for substitution with discharge permits in 2022. The Danish Environmental Protection Agency (DEPA) is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, that are environmentally more acceptable. For some corrosion inhibitors trials are ongoing to find a substitute chemical as reported by the operators.

The Netherlands has reported that in 2020 a total of 36 candidates for substitution are still in use., In 2018 the Dutch national legislation changed to forbid the discharge of substitutable chemicals unless an extended justification is provided by the operator. Some products have been reclassified in a different HMCS category due to new data coming to light at the hazard assessment stage. The quantity used and discharged of substitutable substances on the Netherlands Continental Shelf (NLCS) has decreased between 2008 and 2020. The total use and discharge of substitutable substances in 2010 was 1,141,789.0 kg and 56,818.9 kg respectively. In 2016, use and discharge was 207,127.3 kg and 6,086.7 kg respectively and in 2020, it was 137,786.6 kg and 1,889.0 kg respectively.

Norway has reported that in 2020 a total of 178 substitution candidates are still in use. Operators on the Norwegian Sector are required to report their substitution plans, the reasons why they still have to use or discharge substitution candidates, and when they plan to phase out these substances.

In Norway the discharge of substitution candidates has increased from 106 tons in 2016 to 408 tons in 2020. The bulk of this increase (317 tonnes) is due to the inclusion of in situ produced hypochlorite into the regulatory and reporting regime. Hypochlorite is categorised as "Inorganic LC50 or EC50 <1 mg/L". Other product groups contribution to the discharges are other biocides (61 tonnes) and scale inhibitor (13 tonnes).

Implementation of OSPAR Recommendation 2006/3 as amended by OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that Are, or Which Contain Substances Identified as Candidates for Substitution – 2022

The United Kingdom has reported that 194 offshore chemical products could be expected to be discharged in the future. Out of the 194, 28 were phased-out for some, functions, applications and/or locations and 166 were not phased-out. Technical justification reports for the continued use and discharge of the 194 candidate for substitution offshore chemical products not phased out for discharge can be found in Annex 5.

The use and discharge of substitutable substances on the UKCS has decreased between 2006 and 2020. The total use and discharge of substitutable substances in 2006 was 7,718,194 kg and 2,195,753 kg respectively. In 2010, use and discharge was 4,788,938 kg and 1,335,558 kg respectively, in 2016, it was 2,652,288 kg and 1,291,966 kg respectively and in 2020, it was 3,717,455 kg and 859,235 kg respectively.

3.3 Measures taken to reduce use or discharge of chemicals with no suitable alternative

Denmark and Norway utilise a 'traffic-light' prioritisation system for the identification of products that are, or contain, candidates for substitution. The phase-out of 'red' or 'black' chemicals is prioritised relative to 'yellow' or 'green' chemicals.

The Danish Environmental Protection Agency (DEPA) give permits to discharges of red chemicals if proved that they are the best solution due to technical and safety reasons.

Operators in Ireland are required to use chemicals that do not contain substances that have been identified as candidates for substitution. In cases where no alternative substances exist operators must demonstrate their requirement to use such substances for technical and safety reasons. If alternatives exist but operators elect not to use them, they must provide a technical justification as to why the alternative cannot be used, which is subject to review and approval by the Regulator.

The Dutch State Supervision of Mines (SodM) issues temporary permits, instead of long-term permits, to handle the use or discharge of substitutable chemicals with no suitable alternative.

The Norwegian national regulation states that it is the operator's responsibility to choose as environmentally friendly chemicals as possible, and to reduce discharges as much as possible. This is followed up by the authorities through auditing and the operator's annual reports, and justification for technical/safety needs in applications for discharge permits.

The United Kingdom publishes a list of all offshore chemical products currently registered for use on the UKCS, which confirms whether the offshore chemical products are, or contain, a candidate for substitution. Operators intending to use offshore chemical products on the UKCS are additionally provided with a template that also confirms whether the product is, or contains, a candidate for substitution. The United Kingdom had previously produced a National Plan for the reduction of the use and discharge of all offshore chemical products that have been assigned a substitution warning. The United Kingdom continues to review data, in line with objectives of HMCS, HOCNF Guidelines and this OSPAR Recommendation, that has been provided in support of offshore chemicals registered for use in UK waters on the UK's Offshore Chemicals Notification Scheme database. Taking this approach has resulted in offshore chemical products being reclassified as containing a candidate for substitution, when previously not so.

In the United Kingdom a number of measures have been implemented by offshore operators, chemical manufacturers and suppliers to reduce the use and discharge of candidates for substitution:

• reformulation of existing offshore chemical products resulting in the removal of the substitution warning;

- further environmental testing resulting in the removal of the substitution warning;
- research and development into alternative offshore chemical products, including trials of alternatives;
- replacement of candidate for substitution offshore chemical products with non-substitution offshore chemical products;
- cessation of use of substitution offshore chemical products;
- cessation of discharge of substitution offshore chemical products;
- offshore operators using multiple suppliers instead of one supplier to avoid candidates for substitution; and
- one-off use or trial of substitution offshore chemical products.



Appendix 1

Format for implementation reports concerning OSPAR

Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that are, or contain Substances that have been Identified as Candidates for Substitution

(Note: In accordance with paragraph 5.1 of the Recommendation, this format should be used as far as possible in implementation reports)

1. Implementation Report on Compliance

Year of Report:	2022
Country:	Denmark
Reservation applies	no
Is measure applicable in your country?	yes

If measure is not considered to be applicable, please state the reasons (e.g. no relevant uses or discharges of chemicals that are candidates for substitution)

Means of Implementation of the measure in § 3.1 of the Recommendation (phase- out of discharge of candidates for substitution):	by legislation	by administrative action	by negotiated agreement
	no	yes	no

Overview of the candidates for	CI-6E is no longer discharged by operator in 2022	
substitution that have been replaced or	KI-384 is no longer discharged by operator in 2022	
are no longer discharged		

Overview of the candidates for substitution where the relevant	*KI-3130 KI-3142
is currently no suitable alternative,	КІ-384
including justification	MB-5952
	MEXEL 432/336/1
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, that are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical Name	KI-3130
Supplier	M-I SWACO – Schlumberger Oilfield UK Plc
Registered Category	Offshore chemical
Function/Application	Corrosion inhibitor
Use	Production
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	YES Trials are reported to be ongoing by the operator to substitute the chemical with the product CRW85735
Justification for continued use and discharge	High corrosion rate observed
Reason(s) for	Trials are ongoing in 2022 to identify a suitable substitute

non-replacement	
Evidence in support of continued discharge	Trials are taking place in 2022. At this stage of reporting, there are no further information to be provided.

1. Contains a component that is a surfactant and has a tox value <10 mg/l $\,$

In DK surfactants with a mol. weight less than 700 are considered to bio-accumulate.

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative

KI-3130

*KI-3142

MB-5951

MEXEL 432/336/1

DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, that are environmentally more acceptable.

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical	KI-3142
Namo	
Name	
Supplier	M-I SWACO – Schlumberger Oilfield UK Plc
Registered Category	Offshore chemical
Function/Application	Corrosion inhibitor
Use	Production
Discharge phased out	N/A
Replacement	N/A
chemicals	
enemieais	
Trials Undertaken (Yes	YES
or No)	Trials are reported to be engoing by the energiar to substitute the chemical with
	the resolute CDW05725
	the product CRW85735
Justification for	High corrosion rate observed
continued use and	
continued use and	
discharge	
Reason(s) for	Trials are ongoing in 2022 to identify a suitable substitute
non-replacement	

Evidence in support of continued discharge	Trials are taking place in 2022. At this stage of reporting, there are no further information to be provided.

1. Contains a component that is a surfactant and has a tox value <10 mg/l

In DK surfactants with a mol. weight less than 700 are considered to bioaccumulate. Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative

KI-3130 KI-3142

*MB-5952

MEXEL 432/336/1

DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical	MB-5952
Namo	
Name	
Supplier	M I SWACO - Schlumbargar Oilfield LIK Pla
Supplier	Nei Swaco – Schlumberger Onneid OK Pic
Registered Category	Offshore chemical
Function/Application	Biocide
	Production
Ose	Floudetion
Discharge phased out	N/A
	,
Replacement	N/A
chomicals	
chemicals	
Trials Undertaken (Yes	Νο
or NO)	
Justification for	Used as a biocide to prevent biofouling in oil pipes
continued use and	
discharge	
Poscon(c) for	No suitable substitute identified up till now
Reason(s) for	No suitable substitute luentineu up till now
non-replacement	
non replacement	

Contains sodium hypochlorite. Assessed to be a substitution chemicals according to OSPAR pre-screenings rules.

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative

DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	MEXEL 432/336/1
Supplier	MEXEL Industries S.A.S.
Registered Category	Offshore chemical
Function/Application	Biocide
Use	Production
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used as a biocide to prevent biofouling in oil pipes
Reason(s) for	No suitable substitute identified up till now
non-replacement	
Evidence in support of continued discharge	Contains surfactants. No suitable substitute identified up till now

Reason(s) why identified as a candidate for substitution

Contains surfactants. In DK, surfactants are assessed to bioaccumulate when mol. weight is less than 700.

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification	*PI-79030 A272
	M295 Hydrogen Sulfide Scavenger M295
	M296 Coiled Tubing Lubricant M296
	F100 EZEFLO* F100 Surfactant
	DP/LCH 5160
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical	PI-79030
Name	
Supplier	M-I SWACO Danmark ApS
Registered Category	Offshore chemical
Function/Application	Wax Inhibitor
Use	Production
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	PI-79030 is a wax inhibitor and assist in dissolving wax in oil pipes.

Reason(s) for	No suitable substitute identified up till now
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

Due to their inherent non-biodegradable nature, wax inhibitors are red chemicals (i.e., poly-acrylates or poly vinyl acetates). Nevertheless, the red wax inhibitor component of PI-79030 is highly oil-soluble and the discharge to sea will be minimal of this red component. A calculation using the relevant oil-partitioning and discharge points show that only 0.03% of the chemical's red component will be discharged to sea.

Overview of the candidates for substitution where the relevant	PI-79030 *A272
is currently no suitable alternative,	M295 Hydrogen Sulfide Scavenger M295
including justification	M296 Coiled Tubing Lubricant M296
	F100 EZEFLO* F100 Surfactant
	DP/LCH 5160
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical	A272
Name	
Supplier	Schlumberger Danmark A/S
Registered Category	Offshore chemical
Function/Application	Organic Acid Inhibitor
Use	Completion
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Chemical recipes are under review to provide a greener chemical by end of Q2 2022
Justification for continued use and discharge	A272 is used as organic acid inhibitor since there is no substitution with the same required properties, protection and temperature ranges.

Reason(s) for	No suitable substitute identified up till now
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

Contains surfactants. In DK, surfactants with mol weight less than 700 are
assessed to bioaccumulate. One surfactant is at the same time toxic, i.e.
meets the 2 out of 3 criteria.

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification	PI-79030 A272
	*M295 Hydrogen Sulfide Scavenger M295
	M296 Coiled Tubing Lubricant M296
	F100 EZEFLO* F100 Surfactant
	DP/LCH 5160
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical	M295
Name	
Supplier	Schlumberger Danmark A/S
Registered Category	Offshore chemical
Function/Application	H2S Scavenger
Use	Completion
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	The supplier is working to get the optimum environmental solution which requires doing design engineering and all regulatory qualifications for the Danish sector.
Justification for continued use and discharge	This chemical is required to be used as H2S scavenger as there is currently no substitution that has the required performance of the chemistry in the wellbore environment.

Reason(s) for non-replacement	This chemical is required to be used as H2S scavenger as there is currently no substitution that has the required performance of the chemistry in the wellbore environment.
Evidence in support of continued discharge	No suitable substitute identified up till now

Contains surfactants. In DK, surfactants with mol weight less than 700 are
assessed to bioaccumulate. One surfactant is at the same time toxic, i.e.
meets the 2 out of 3 criteria.

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification	PI-79030 A272
	M295 Hydrogen Sulfide Scavenger M295
	*M296 Coiled Tubing Lubricant M296
	F100 EZEFLO* F100 Surfactant
	DP/LCH 5160
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical	M296 Coiled Tubing Lubricant
Name	
Supplier	Schlumberger Danmark A/S
Registered Category	Offshore chemical
Function/Application	Lubricant agent/Completion
Use	Lubricant agent in coiled tubing
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	No alternatives identified at this stage

Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

Contains surfactants. In DK, surfactants with mol weight less than 700 are	
assessed to bioaccumulate. One surfactant is at the same time toxic, i.e.	
meets the 2 out of 3 criteria.	

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative.	PI-79030 A272 M295 Hydrogen Sulfide Scavenger M295
including justification	M296 Coiled Tubing Lubricant M296 *F100 EZEFLO* F100 Surfactant
	DP/LCH 5160
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical	F100 EZEFLO Surfactant
Name	
Supplier	Schlumberger Danmark A/S
Registered Category	Offshore chemical
Function/Application	Foaming agent for acid treatment Well Service
Use	Completion / Matrix treatment
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No - the supplier is working to get the optimum environmental solution which requires doing design engineering and all regulatory qualifications for the Danish sector.
Justification for continued use and discharge	This chemical is required to be used as surfactant as there is currently no substitution that has the required performance of the chemistry in the wellbore environment.

Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

Contains surfactants. In DK, surfactants with mol weight less than 700 are assessed to bioaccumulate. Surfactant are at the same time toxic, i.e. meets the 2 out of 3 criteria.

Overview of the candidates for substitution where the relevant	PI-79030 A272
is currently no suitable alternative,	M295 Hydrogen Sulfide Scavenger M295
including justification	M296 Coiled Tubing Lubricant M296
	F100 EZEFLO* F100 Surfactant
	*DP/LCH 5160
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

Registered Chemical Name	DP/LCH 5160
Supplier	SNF SA
Registered Category	Offshore chemical
Function/Application	Water Shut Off
Use	
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	It is a new product developed for conformance control with simplified operational procedures. DP/LCH 5160 is a temperature activated gel intended to be used for reservoir restoration. There is no substitution for DP/LCH 5160 (i.e., with biodegradability >20% in 28 days) that can withstand the shear forces in the process or the reservoir.

Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

Biodegradability less than 20%

Overview of the candidates for	*DCA-19006 (Crosslinker)
substitution where the relevant regulatory authority is satisfied that there	DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	J622
	J636
	SAFE-SOLV 148
	SAFE-SURF Y
	Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	DCA-19006
Supplier	HALLIBURTON DENMARK ApS:
Registered Category	Offshore chemical
Function/Application	Drilling/Completion
Use	Sealing/Fluid loss control chemical
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο

Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

< 20% biodegradable

Overview of the candidates for	DCA-19006 (Crosslinker)
substitution where the relevant regulatory authority is satisfied that there	*DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	J622
	J636
	SAFE-SOLV 148
	SAFE-SURF Y
	Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	DCA-25012
Supplier	HALLIBURTON DENMARK ApS:
Registered Category	Offshore chemical
Function/Application	Drilling/Completion
Use	Sealing/Fluid loss control chemical
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No

Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

< 20% biodegradable

Overview of the candidates for	DCA-19006 (Crosslinker)
substitution where the relevant regulatory authority is satisfied that there	DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	*J622
	J636
	SAFE-SOLV 148
	SAFE-SURF Y
	Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	J622
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Offshore chemical
Function/Application	Fracturing/Drilling/Diverter
Use	Fracturing chemical
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο

Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

< 20% biodegradable
Overview of the candidates for	DCA-19006 (Crosslinker)
substitution where the relevant regulatory authority is satisfied that there	DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	J622
	*J636
	SAFE-SOLV 148
	SAFE-SURF Y
	Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	J636
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Offshore chemical
Function/Application	Fracturing/Drilling
Use	Fracturing chemical
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No

Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

< 20% biodegradable

Overview of the candidates for	DCA-19006 (Crosslinker)
substitution where the relevant regulatory authority is satisfied that there	DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	J622
	J636
	*SAFE-SOLV 148
	SAFE-SURF Y
	Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	SAFE-SOLV 148
Supplier	M-I SWACO Schlumberger Oilfield UK PLC
Registered Category	Offshore chemical
Function/Application	Stimulation/Drilling
Use	Enhanced oil recovery
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No

Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

Contains surfactant with tox value less than 10 mg/l.

Overview of the candidates for substitution where the relevant	DCA-19006 (Crosslinker) DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	J622
	J636
	SAFE-SOLV 148
	*Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	Well Life 665
Supplier	HALLIBURTON DENMARK ApS
Registered Category	Offshore chemical
Function/Application	Cement or Cement Additive/Drilling
Use	Cementing
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and	At this stage there are no substitutes identified

discharge	
Reason(s) for non-replacement	No alternatives identified at this stage
Evidence in support of continued discharge	No suitable substitute identified up till now

Non-biodegradable

Overview of the candidates for substitution where the relevant	DCA-19006 (Crosslinker) DCA-25012 (Gelling Agent)
is currently no suitable alternative,	DCA-25013
including justification	J622
	J636
	SAFE-SOLV 148
	Well Life 665
	*MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical	MS-250
Nume	
Supplier	M-I Swaco Schlumberger Oilfield UK PLC
Registered Category	Offshore chemical
Function/Application	Coloring Dye/Drilling
Use	Oil field water systems
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and	At this stage there are no substitutes identified

discharge	
Reason(s) for non-replacement	No alternatives identified at this stage
Evidence in support of continued discharge	No suitable substitute identified up till now

Non-biodegradable

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	Biotreat 13983
Supplier	Clariant Oil Services Scandinavia AS
Registered Category	Offshore chemical
Function/Application	Biocide
Use	In the production
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for non-replacement	No alternatives identified at this stage
Evidence in support of	No suitable substitute identified up till now

MB-5952

Waxtreat DF 3738

DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

continued discharge			

Contain surfactant, less than 700 mol. weight and toxic (2 out of 3 –criteria)

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	Waxtreat DF 3738
Supplier	Clariant Oil Services Scandinavia AS
Registered Category	Offshore chemical
Function/Application	Wax dissolver/inhibitor
Use	In the production
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for non-replacement	No alternatives identified at this stage
Evidence in support of	No suitable substitute identified up till now

2

MB-5952

*Waxtreat DF 3738

DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

Contain polymer, non biodegradable.

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical	Sodium Hypochlorite
Name	
Supplier	Clariant Oil Services Scandinavia AS
Registered Category	Offshore chemical
Function/Application	Biocide
Use	In the production
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of	No suitable substitute identified up till now

MB-5952

Waxtreat DF 3738

*Sodium Hypochlorite

DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

continued discharge	

Inorganic, tox. Value less than 1 mg/l

Overview of the candidates for	DCA-19006 (Crosslinker)
substitution where the relevant regulatory authority is satisfied that there	DCA-25012 (Gelling Agent)
is currently no suitable alternative,	*DCA-25013
including justification	J622
	J636
	SAFE-SOLV 148
	SAFE-SURF Y
	Well Life 665
	MS-250
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	DEPA is asking the operators to justify the use and discharge of substitution chemicals and at the same time encourage the operators to seek for alternatives, which are environmentally more acceptable.

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	DCA-25013
Supplier	HALLIBURTON DENMARK ApS:
Registered Category	Offshore chemical
Function/Application	Drilling/Completion
Use	Sealing/Fluid loss control chemical
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No

Justification for continued use and discharge	At this stage there are no substitutes identified
Reason(s) for	No alternatives identified at this stage
non-replacement	
Evidence in support of continued discharge	No suitable substitute identified up till now

< 20% biodegradable

Format for implementation reports concerning OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that are, or contain Substances that have been Identified as Candidates for Substitution

(Note: In accordance with paragraph 5.1 of the Recommendation, this format should be used as far as possible in implementation reports)

1. Implementation Report on Compliance

Year of Report:	2022
Country:	Ireland
Reservation applies	yes/ no*
Is measure applicable in	yes/ no*
your country?	

If measure is not considered to be applicable, please state the reasons (e.g. no relevant uses or discharges of chemicals that are candidates for substitution)

Means of Implementation of the measure in § 3.1 of the Recommendation (phase- out of discharge of candidates for substitution):	by legislation	by administrative action	by negotiated agreement
	yes /no*	yes/ no*	yes /no*

^{*} Delete whichever is not appropriate

Overview of the candidates for substitution that have been replaced or are no longer discharged There are currently no substances Identified as Candidates for Substitution being discharged in Irish waters.

Following the cessation of production operations from a cluster of three gas fields that are now being decommissioned, HW-540 V3 hydraulic fluid, which was used in production operations, is no longer being discharged. Prior to disconnection of subsea umbilicals the operator recovered as much of the control umbilical contents as possible, including HW 540 V3.

Disconnection operations during decommissioning resulted in the discharge of small volumes of residual umbilical contents.

As part of the decommissioning project the Operator has applied for consent to leave pipelines and umbilicals, which contain residual HW 540 V3, in situ. This is currently being considered under Irish Dumping at Sea legislation (Dumping at Sea Act, 1996, as amended).

Overview of the candidates for N/A substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification For oil and gas activities offshore Ireland Operators are required Overview of the measures taken to to use chemicals that do not contain Substances that have been reduce use or discharge of chemicals with Identified as Candidates for Substitution. no suitable alternative In cases where no alternative substances exist Operators must demonstrate their requirement to use such substances for technical and safety reasons. If alternatives exist but operators elect not to use them, they must provide a technical justification as to why the alternative cannot be used, which is subject to review and approval by the Regulator.

Please provide information on:

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	Oceanic HW 540 V3
Supplier	MacDermid Offshore Solutions
Registered Category	OCNS Category A
Function/Application	Hydraulic fluid
Use	Water based hydraulic fluid for production control
Discharge phased out	No longer in use as the gas fields are being decommissioned. Very small quantities of residual HW-540 hydraulic fluid discharged as a result of disconnection of subsea umbilicals, associated with decommissioning operations.
Replacement chemicals	Oceanic HW 540E, Oceanic HW 443R
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The gas fields are currently being decommissioned so this chemical is no longer in active use, however its use was extended in the past for the reasons set out below.
Reason(s) for	[Information provided should confirm the reason or reasons (if more than one operator) for non-replacement of a chemical from the categories listed below:
non-replacement	2 Compatibility issues with alternative
	3. Operational constraints by third party
	6. Unable to allocate time for trial(s)
	8. Other (please explain below)]
Evidence in support of	
continued discharge	2. Compatibility issues with alternative
	The Operator advised that any change to the hydraulic fluid would require testing to ensure material compatibility and the potential requirement for equipment change.
	3. Operational constraints by third party
	Chemical supplier informed Regulator that use of alternative fluids would require acceptance by the subsea equipment manufacturer, who were unlikely to approve if changing fluids increased the risk with safety of their critical hydraulic systems.
	6. Unable to allocate time for trial(s)
	Fields too near to end of production and decommissioning
	8. Other (please explain below)]
	Replacement would have resulted in excessive discharge of the existing hydraulic fluid in addition to the discharge of the replacement hydraulic fluid. This could

	not be justified given that the fields were too near to end of production and
	decommissioning.
4	

1. Oceanic HW 540 V3 is ranked as high environmental hazard based on high toxicity and/or low biodegradation of a number of components.



Implementation report The Netherlands 2022

Format for implementation reports concerning OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that are, or contain Substances that have been Identified as Candidates for Substitution

(Note: In accordance with paragraph 5.1 of the Recommendation, this format should be used as far as possible in implementation reports)

1. Implementation Report on Compliance

Year of Report:	2022 (data assessed 2010-2020)
Country:	The Netherlands
Reservation applies	no*
Is measure applicable in your country?	yes*

If measure is not considered to be applicable, please state the reasons (e.g. no relevant uses or discharges of chemicals that are candidates for substitution)

ble
2

^{*} Delete whichever is not appropriate

Overview of the candidates for substitution that have been replaced or are no longer discharged Following the adoption of Recommendation 2006/3, offshore oil and gas operators in Netherlands (NL) waters have been required to complete an annual return confirming the use and discharge of offshore chemical products that are/or contain candidates for substitution, including information on those products replaced during the calendar year. The number of chemical products which are candidates for substitution permitted for use and discharge offshore each year (2010 to 2020) was compiled by the NL (based on annual return data submitted by permit holders).

In addition to analysing annual returns data, NL also collects data on the actual use and discharge of chemical products which are candidate for substitution offshore. Table 1 provides an overview of chemical products which are classed as candidate for substitution and substitutable substances that were actually used and/or discharged between 2010 and 2020. The table demonstrates a downward trend in the number of products which are candidates for substitution and substitutable substances used and discharged between 2010 and 2020. The breakdown of the Harmonised Mandatory Control Scheme (HMCS) category at both product and substance level is also shown. It is important to note that the query run to provide these HMCS category figures are based on the latest assessment information at the time of running the query (March 2022) and therefore do not necessarily reflect the HMCS category may change during any given reporting year when new data comes to light about a substance which results in a reclassification.

Most products used and discharged are hazard assessed as either HMCS C (highly persistent) or HMCS D (fulfils 2 out of 3 of the persistence, biodegradation or toxicity (PBT) criteria in the OSPAR pre-screening scheme). Only one occurrence of HMCS A (containing a substance on OSPARs list of chemicals for priority action) was noted in 2013 which was flagged for Lead and not discharged to the marine environment.

Based on NL returns data, the use and discharge of substitutable substances on the NL continental shelf (NLCS) has decreased between 2008 and 2020 with some variation between 2008 and 2011 but a steady decrease in discharges seen from 2012 onwards.

The total use and discharge of substitutable substances in 2008 was 488,577.4 kg and 34,442.0 kg respectively. In 2010, use and discharge rose to 1,141,789.0 kg and 56,818.9 kg respectively. In 2016, use and discharge was 207,127.3 kg and 6,086.7 kg respectively and in 2020, it was 137,786.6 kg and 1,889.0 kg respectively. Although comparison of the data does not account for year-on-year differences in levels of offshore activity, the data does indicate an overall reduction in the discharge of substitutable substances between 2008 and 2020.

Figure 1 illustrates that there has been an overall decrease in the quantity of substitutable substances used and discharged between 2008 and 2020 with some year-on-year variation. Contracting parties are invited to note the different scales used for Use and Discharge.

A levelling off in use and discharge is yet to be observed but the overall trend appears to be downwards with discharges at their lowest level since 2008. The decrease in the number of products being used and discharged which are candidates for substitution could be due to a number of reasons including:

- Operators using the same products that are candidates for substitution for different applications;
- Substances reclassified and receiving a substitution warning where they did not have one previously due to new data coming to light at the hazard assessment stage.

Table 1. Number of chemical products which are candidates for substitution and substitutablesubstances used and discharged based on NL OSPAR Returns data (2010-2020). The HMCScategory at both product and substance-level is also shown.

	Number of products used		Number of products discharged		Number of substances used		Number of substances discharged	
2010	<u>81</u>	40 C	19	19 C	85	36 C	53	16 C
2010	01	41 D	75	30 D	05	49 D	55	37 D
2011	85	41 C	18	20 C	103	51 C	56	25 C
2011	85	44 D	40	28 D	105	52 D	50	31 D
2012	62	34 C	22	15 C	70	40 C	54	24 C
2012	05	29 D	55	18 D	79	39 D	54	30 D
		1 A		0 A		1 A		0 A
2013	60	30 C	32	13 C	81	36 B	47	22 C
		29 D		19 D		44 C		25 D
2014	61	32 C	31	12 C	74	31 C	43	16 C
2014	01	29 D		19 D		43 D		27 D
2015	62	35 C	21	15 C	01	37 C	10	21 C
2015	05	28 D	21	16 D	01	44 D	40	27 D
2016	57	28 C	10	5 C	74	33 C	25	6 C
2010	57	29 D	10	13 D	74	41 D	25	19 D
2017	20	20 C	10	6 C	10	25 C	19	10 C
2017	50	10 D	10	4 D	40	21 D		9 D
2019	2018 32 20 C 12 D	20 C	E	1 C	10	20 C	F	1 C
2010		12 D	5	4 D	40	20 D	5	4 D
2010	0010 44	29 C	C	1 C	40	30 C	E	1 C
2019	44	15 D	0	5 D	49	19 D	5	4 D
2020	26	17 C	7	0 C	38	16 C	5	0 C
2020 36	30	19 D	19 D 7	7 D		22 D		5 D



Figure 1. The quantity (kg) of substitutable chemicals used and discharged between 2008 and 2020 on the Netherlands Continental Shelf based on NL Returns data. Please note the differing scales for use and discharge.

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification In general, a decrease in use and discharge of chemicals which are candidates for substitution is observed.

For 2020 we see the following issues with the candidates for substitution chemicals:

- One product is a biocide for which the Dutch Board for the Authorisation of Plant Protection Products and Biocides (Ctgb) was not able to process the approval in time. Therefore, the State Supervision of Mines (SodM), issued a permit to extend the use of this substitution product.
- Changes in HMCS category were noted in the following cases:
 - Three products changed from HMCS category R (non-substitutable) to D (substitutable) in 2020. Due to this category change these products were defined as chemicals for substitution in 2020 where they were not in previous years.
 - (2) Four products were registered as HMCS category R (notifiable products) in 2020 and changed HMCS category after 2020.
 - (3) One product changed from HMCS category R to D in 2018.

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative Following adoption of Recommendation 2006/3, SodM issued temporary permits, instead of long-term permits, to handle the use or discharge of substitutable chemicals with no suitable alternative.

(a) specific measures taken to give effect to this Recommendation;

The SodM issues a permit to discharge for substitutable chemicals and requires an extended justification from operators.

(b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure;

Two specific difficulties have been encountered and are summarised below:

- (1) Legal: In the Netherlands, the CTGB list details the biocides authorised for use in the Netherlands. This means that authorised biocides on this list can be used offshore even if they attract a substitution warning.
- (2) Practical: Although outside the scope of the years evaluated in this report (2010-2020) it was reported that in 2021 1 kg of product containing Copper was authorised for use in high-temperature, high-pressure wells and was authorised for safety reasons where no suitable alternative could be found.
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

In the Netherlands, up until 2018, Dutch national legislation allowed discharge of all chemicals. However, since 2018 the legislation changed to forbid the discharge of substitutable chemicals unless a robust case for discharge is provided by the operator. An example of a reasonable case would be where a HMCS category change takes place which reclassifies a previously non-substitutable product as substitutable and therefore forbidden from being discharged under the Netherlands legislation.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	[Confirm product trade name as registered on national list]
Supplier	[Chemical Supplier Company Name]
Registered Category	[National registered category e.g. HQ/OCNS Category at time of template completion]
Function/Application	[Registered Primary OSPAR Function]
	Choose an item.
Use	[If use is different from registered OSPAR function then a brief description of the use of the chemical as provided by the operator. The information provided should also confirm if the chemical is used in production, drilling, well intervention, pipeline or decommissioning operations. Where there is more than one use or more than operator using the chemical then information should be collated and summarised by the Contracting Party]
Discharge phased out	[Where the phase-out of discharge has not involved a replacement chemical then please provide details of the method and operational use. If the discharge has not been phased out, then complete as n/a]

Replacement	[Confirmation of chemical use where with the candidate for substitution has been
chemicals	replaced by a suitable alternative. Confirm replacement chemical(s) and if that
	Where available, please also provide details of the practicability, efficacy, cost
	and onvironmental impact of replacement chemicals
	If there are no replacement chemicals, then complete as n/al
Trials Understelson (Ves	[Have trials been undertaken to identify a suitable replacement chemical. Ves or
Trials Undertaken (Yes	In a suitable replacement chemical, res of
or NO)	If yos, then a summary of any unsuccessful trials undertaken should be provided
	holow in Evidence in support of continued discharge section
least field and any fam	(Present a summary of technical or continued discharge section)
Justification for	(Present a summary of technical of safety reasons(s) for the continued use and
continued use and	Uscharge of the chemical as provided by the operators.
discharge	information should be collated and summarised by the Contracting Party
	Information should be conated and summarised by the contracting Party
Reason(s) for	(information provided should commin the reason of reasons (in more than one consistent) for non-replacement of a chemical from the categories listed below:
non-replacement	1. No suitable alternative
	Compatibility issues with alternative
	2. Compatibility issues with alternative
	A Trial angoing
	4. That ongoing
	6. Unable to allocate time for trial(s)
	9. Other (place explain below)]
	a. Other (please explain below)]
Evidence in support of	[Evidence should be provided in support of those chemicals that are, or which
continued discharge	contain substitutable substances, where it has not been feasible to either phase
	out the discharge or replace those chemicals for technical or safety reasons.
	If trials of alternative chemical products have been undertaken then a summary
	of any trial(s) should be provided, including confirmation of chemicals considered
	as a suitable alternative(s).
	If trials are ongoing, then please provide details.
	If awaiting trials then please provide evidence of when the trials will proceed.
	If there are operational constraints by a third party then please provide details.
	If there are other reasons then please provide relevant evidence in support]

1. [Reason for categorisation as a substitutable substance]	
2. [Reason for categorisation as a substitutable substance]	п



Implementation report Norway 2022

Format for implementation reports concerning OSPAR Recommendation 2019/02 on Environmental Goals for the Discharge by the Offshore Industry of Chemicals that are, or contain Substances that have been Identified as Candidates for Substitution

(Note: In accordance with paragraph 5.1 of the Recommendation, this format should be used as far as possible in implementation reports)

1. Implementation Report on Compliance

Year of Report:	2022
Country:	Norway
Reservation applies	yes /no*
Is measure applicable in your country?	yes /no*

If measure is not considered to be applicable, please state the reasons (e.g. no relevant uses or discharges of chemicals that are candidates for substitution)

Means of Implementation of the measure in § 3.1 of the Recommendation (phase- out of discharge of candidates for substitution):	by legislation	by administrative action	by negotiated agreement
	yes/ no *	yes/ no*	yes /no*

Overview of the candidates for substitution that have been replaced or are no longer discharged Choice and ranking of chemicals, their environmental and substitution assessment are the responsibility of the operators in Norway. Therefore, no complete list of all substituted chemicals is available for the Norwegian Environment Agency (NEA).

^{*} Delete whichever is not appropriate

Overview of the candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification	Plans and status for substitution of chemicals are reported in the operator's annual reports but collecting information about individual products is time-consuming and we were not able to perform this task within the given deadline. The discharge of substitution candidates has increased from 106 tons in 2016 to 408 tons in 2020. The bulk of this increase (317 tonnes) is due to the inclusion of in situ produced hypochlorite into the regulatory and reporting regime. Hypochlorite is categorised as "Inorganic LC50 or EC50 <1 mg/L". Other product groups contribution to the discharges are other biocides (61 tonnes) and scale inhibitor (13 tonnes).
	Sodium hypochlorite is a commonly used biocide showing acute toxicity to aquatic organisms. It quickly disintegrates in the aquatic environment to less toxic compounds and, therefore, the environment risk has been expected to be negligible. There is however increased focus on possible harmful halogenated by-products, and NEA is currently investigation environmental effects from discharge of in situ produced hypochlorite from offshore installations.
Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	The Norwegian HSE regulation for the petroleum industry states that operators shall select those chemicals with the lowest risk of environmental harm. Furthermore, use and discharge of chemicals shall be reduced to the extent possible. This is followed up by NEA through scrutinizing and commenting the annual reports of the operators and regular auditing activities

- (a) specific measures taken to give effect to this Recommendation;
- (b) any special difficulties encountered, such as practical or legal problems, in the implementation of this measure; and
- (c) any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews.

Note: In accordance with paragraph 5.2c of the Recommendation, the table below should be used in the implementation reports to provide details of each candidate of substitution, where despite considerable effort, it has not been feasible for technical or safety reasons to phase out the discharge.

2. Candidate for Substitution Information

Registered Chemical Name	[Confirm product trade name as registered on national list]
Supplier	[Chemical Supplier Company Name]
Registered Category	[National registered category e.g. HQ/OCNS Category at time of template completion]
Function/Application	[Registered Primary OSPAR Function]

	Choose an item.
Use	[If use is different from registered OSPAR function then a brief description of the use of the chemical as provided by the operator.
	The information provided should also confirm if the chemical is used in production, drilling, well intervention, pipeline or decommissioning operations.
	Where there is more than one use or more than operator using the chemical then information should be collated and summarised by the Contracting Party]
Discharge phased out	[Where the phase-out of discharge has not involved a replacement chemical then please provide details of the method and operational use.
	If the discharge has not been phased out, then complete as n/a]
Replacement chemicals	[Confirmation of chemical use where with the candidate for substitution has been replaced by a suitable alternative. Confirm replacement chemical(s) and if that replacement has proved successful.
	Where available, please also provide details of the practicability, efficacy, cost and environmental impact of replacement chemicals
	If there are no replacement chemicals, then complete as n/a]
Trials Undertaken (Yes or No)	[Have trials been undertaken to identify a suitable replacement chemical, Yes or No;
	If yes, then a summary of any unsuccessful trials undertaken should be provided below in Evidence in support of continued discharge section]
Justification for continued use and	[Present a summary of technical or safety reasons(s) for the continued use and discharge of the chemical as provided by the operators.
discharge	Where there is more than one operator using and discharging the chemical then information should be collated and summarised by the Contracting Party]
Reason(s) for	[Information provided should confirm the reason or reasons (if more than one operator) for non-replacement of a chemical from the categories listed below:
non-replacement	1. No suitable alternative
	2. Compatibility issues with alternative
	3. Operational constraints by third party
	4. Trial ongoing
	5. Awaiting trial (installation/supplier)
	6. Unable to allocate time for trial(s)
	8. Other (please explain below)]
Evidence in support of continued discharge	[Evidence should be provided in support of those chemicals that are, or which contain substitutable substances, where it has not been feasible to either phase out the discharge or replace those chemicals for technical or safety reasons.
	If trials of alternative chemical products have been undertaken then a summary of any trial(s) should be provided, including confirmation of chemicals considered as a suitable alternative(s).
	If trials are ongoing, then please provide details.
	If awaiting trials then please provide evidence of when the trials will proceed.
	If there are operational constraints by a third party then please provide details.

If there are other reasons then please provide relevant evidence in support]

- 1. [Reason for categorisation as a substitutable substance]
- 2. [Reason for categorisation as a substitutable substance]

List of chemical products containing substitution candidate substances used in Norway in 2020

Trade name	Function group (description)
1. 2,6-DFBA	37 - Other Chemicals
2. AFMR12915A	04 - Defoamer
3. AFMR19242A	04 - Defoamer
4. AFMR20369A	04 - Defoamer
5. ARC 1x1 NV	28 - Fire protection
6. Adapta	18 - Viscosifier
7. Amerel 2000	04 - Defoamer
8. BARAZAN L	18 - Viscosifier
9. BDF-513	18 - Viscosifier
10. BENTONE 38	18 - Viscosifier
11. BIOC41000A	01 - Biocides
12. BR-ELT	37 - Other Chemicals
13. Balder in-situ hypokloritt	40 - Hypochlorite
14. BaraFLC IE-513	17 - Lost Circulation
15. BaraFLC IE-513	18 - Viscosifier
16. BaraFLC IE-513	37 - Other Chemicals
17. Bentone 38	18 - Viscosifier
18. Biotreat Sodium Hypochlorite 13-15%	01 - Biocides
19. CC-5167	27 - Cleaning agent
20. CLAR13208A	06 - Flocculant
21. Castrol Transaqua HC 10	10 - Hydraulic liquid
22. Castrol Transaqua HT2	10 - Hydraulic liquid
23. Castrol Transaqua HT2-N	10 - Hydraulic liquid
24. DF-510	04 - Defoamer
25. DF-9020	04 - Defoamer
26. DFW81935 Defoamer	04 - Defoamer
27. Defoam NS	04 - Defoamer
28. EB-80101	15 - Demulsifier
29. EB-8062	15 - Demulsifier
30. EB-8063	15 - Demulsifier
31. EB-8075	15 - Demulsifier
32. EB-8199	15 - Demulsifier
33. EB-830	15 - Demulsifier
34. EB-8314	15 - Demulsifier
35. EB-8315	15 - Demulsifier
36. EB-8316	15 - Demulsifier
37. EB-8331	15 - Demulsifier
38. EB-8399	15 - Demulsifier
39. EB-8528	15 - Demulsifier
40. EB-89089	15 - Demulsifier
41. EC 9242A	04 - Defoamer
42. EC1575A	02 - Corrosion inhibitors

Trade name	Function group (description)
43. ECOTROL RD	17 - Lost Circulation
44. ECOTROL RD	18 - Viscosifier
45. ECOTROL RD	37 - Other Chemicals
46. EMBR12257A	04 - Defoamer
47. EMBR12257A	15 - Demulsifier
48. EPT-3370	15 - Demulsifier
49. EPT-3371	15 - Demulsifier
50. EPT-3440	06 - Flocculant
51. EPT-4163	15 - Demulsifier
52. EPT-4480	15 - Demulsifier
53. EPT-4481	15 - Demulsifier
54. EZY-TURN© #12	23 - Dope
55. Egenprodusert NaOCl	40 - Hypochlorite
56. FAZE-MUL CW	22 - Emulsifiers
57. FLOCTREAT 7924	06 - Flocculant
58. FLOCTREAT 7926	06 - Flocculant
59. GELTONE II	16 - Weighting. Gelling
60. GELTONE II	18 - Viscosifier
61. Glythermin P 44-00	09 - Antifreezer
62. Goliat in-situ hypokloritt	40 - Hypochlorite
63. HOUGHTO-SAFE NL1	10 - Hydraulic liquid
64. Houghto-Safe 273CTF	10 - Hydraulic liquid
65. Hypersperse MDC150	03 - Scale inhibitors
66. Hypokloritt	40 - Hypochlorite
67. IC-Dissolve 1 - CONC	27 - Cleaning agent
68. IFE-WT-1	37 - Other Chemicals
69. IFE-WT-15	37 - Other Chemicals
70. IFE-WT-16	37 - Other Chemicals
71. IFE-WT-17	14 - Dye
72. IFE-WT-17	37 - Other Chemicals
73. IFE-WT-2	37 - Other Chemicals
74. IFE-WT-20	37 - Other Chemicals
75. IFE-WT-3	37 - Other Chemicals
76. IFE-WT-30	14 - Dye
77. IFE-WT-4	37 - Other Chemicals
78. IFE-WT-41	37 - Other Chemicals
79. IFE-WT-42	37 - Other Chemicals
80. IFE-WT-44	14 - Dye
81. IFE-WT-5	37 - Other Chemicals
82. IFE-WT-60	37 - Other Chemicals
83. IFE-WT-62	37 - Other Chemicals
84. IFE-WT-7	37 - Other Chemicals
85. IFE-WT-8	37 - Other Chemicals
86. INVERMUL NT	22 - Emulsifiers

Tra	Trade name		Function group (description)
	87. Irgatreat CI 740		32 - Water treatment chemical
	88. J622 - Low Temperature Fiber		26 - Completion fluids
	89. J622 - Low Temperature Fiber		34 - Diverting agent
	90. J636 -	Diverting Agent J636-BroadBand™	34 - Diverting agent
	91. J677 La	arge particle diverting agent J677	34 - Diverting agent
	92. JET-LU	BE KOPR-KOTE©	23 - Dope
	93. Jet-Lul	be Alco EP 73 PLUS	24 - Drilling Lubricants
	94. Klor		40 - Hypochlorite
	95. L49 - O	SYBAN* L49 SCALE INHIBITOR	03 - Scale inhibitors
	96. MB-51	23	01 - Biocides
	97. MB-54	9	01 - Biocides
	98. MB-59	27	01 - Biocides
	99. MDEA		36 - CO2 remover
	100.	MS-200	14 - Dye
	101.	Nalfleet 2000	02 - Corrosion inhibitors
	102.	Natrium Hypokloritt	40 - Hypochlorite
	103.	OCEANIC HW 443 v2	10 - Hydraulic liquid
	104.	OXYGEN SCAVENGER PLUS	05 - Oxygen Scavengers
	105.	Optiprop G2 coated Bauxlite Plus (all	37 - Other Chemicals
	sieve s	izes)	
	106.	Optiprop G2 coated Carbolite	37 - Other Chemicals
	107.	PARA20276A	13 - Wax inhibitor
	108.	PFR797 Sodium Hypochlorite	01 - Biocides
	109.	PI-7192	13 - Wax inhibitor
	110.	PI-7194	13 - Wax inhibitor
	111.	PI-7393	13 - Wax inhibitor
	112.	PI-7676	13 - Wax inhibitor
	113.	PROXEL XL2	01 - Biocides
	114.	PermaClean© PC-98 PLUS	27 - Cleaning agent
	115.	PermaClean [®] PC-11	01 - Biocides
	116.	Phasetreat 14862	37 - Other Chemicals
	117.	Polybutene multigrade (PBM)	24 - Drilling Lubricants
	118.	Polybutene multigrade (PBM)	37 - Other Chemicals
	119.	RBW26094	06 - Flocculant
	120.	RE-HEALING FOAM™ RF3 3%	28 - Fire protection
	121.	RE-HEALING RF1, 1% Foam	28 - Fire protection
	122.	RE-HEALINGmRF3, 3% Low Viscosity	27 - Cleaning agent
	Freeze	Protected Foam Concentrate	
	123.	RE-HEALING RF3, 3% Low Viscosity	28 - Fire protection
	Freeze	Protected Foam Concentrate	
	124.	RE-HEALING™ RF1, 1% Foam	28 - Fire protection
	125.	RE-HEALING [™] RF3, 3% Low Viscosity	28 - Fire protection
	Freeze	Protected Foam Concentrate	
	126.	RE-HEALING™ RF3X3% FREEZE	28 - Fire protection

Trade name		Function group (description)
PROTECTED ATC™ FOAM CONCENTRATE		
127.	RF1	28 - Fire protection
128.	RGTW-001	37 - Other Chemicals
129.	RGTW-002	37 - Other Chemicals
130.	RGTW-003	37 - Other Chemicals
131.	RGTW-004	37 - Other Chemicals
132.	RGTW-01-01	37 - Other Chemicals
133.	RGTW-01-02	37 - Other Chemicals
134.	RGTW-04-01	37 - Other Chemicals
135.	RGTW-04-02	37 - Other Chemicals
136.	RGTW-10-02	37 - Other Chemicals
137.	RGTW-24-02	37 - Other Chemicals
138.	RP 15-1027	22 - Emulsifiers
139.	SCALETREAT 8217	03 - Scale inhibitors
140.	SCALETREAT DF 13935	03 - Scale inhibitors
141.	SI-40035	03 - Scale inhibitors
142.	SI-4038	03 - Scale inhibitors
143.	SOC 313	04 - Defoamer
144.	Safe-Surf E	27 - Cleaning agent
145.	Sand SDC	26 - Completion fluids
146.	Self-generated hypochlorite	01 - Biocides
147.	Self-generated hypochlorite	40 - Hypochlorite
148.	Sodium Hypochlorite	40 - Hypochlorite
149.	Sodium hypochlorite 13-15%	01 - Biocides
150.	Soltex [®] E Additive	21 - Shale inhibitors
151.	Spacer Pod NS	34 - Diverting agent
152.	TRACERCO (TM) 158C	37 - Other Chemicals
153.	TRETOLITE¿ DMO86701K	15 - Demulsifier
154.	TRETOLITE™ DMO86675	15 - Demulsifier
155.	TROSKIL 92C	01 - Biocides
156.	Tracerco 190b	37 - Other Chemicals
157.	Ultralube lle	12 - Friction reducing agent
158.	VAPTREAT	03 - Scale inhibitors
159.	VAPTREAT	32 - Water treatment chemical
160.	VERSAMOD	17 - Lost Circulation
161.	VERSAMOD	18 - Viscosifier
162.	VERSAMOD	19 - Dispersants
163.	VERSAPRO P/S	22 - Emulsifiers
164.	VERSATROL M	17 - Lost Circulation
165.	VERSATROL M	18 - Viscosifier
166.	VERSATROL M	22 - Emulsifiers
167.	VERSATROL M	37 - Other Chemicals
168.	VG Supreme	18 - Viscosifier
169.	Vaptreat	01 - Biocides

Trade name		Function group (description)
170.	Vaptreat	03 - Scale inhibitors
171.	Vaptreat	32 - Water treatment chemical
172.	Versatrol	18 - Viscosifier
173.	WT-1099	06 - Flocculant
174.	WT-1099	32 - Water treatment chemical
175.	WT-1378	06 - Flocculant
176.	WT-1378	32 - Water treatment chemical
177.	WT-1432	06 - Flocculant
178.	self produced hypochlorite	40 - Hypochlorite
Implementation report concerning OSPAR Recommendation 2006/3 on environmental goals for the discharge by the offshore industry of chemicals that are, or contain substances that are, identified as 'Candidates for Substitution'

Year of Report:	2020
Country:	UK
Reservation applies	No
Is measure applicable in your country?	Yes

If not applicable, then state why not (e.g. no relevant uses or discharges of candidates for substitution)

Means of Implementation of the measure in § 3.1 of the Recommendation (phase-out of discharge of candidates for substitution):

by legislation	by administrative action	by negotiated agreement
No	Yes	Yes

Overview of the candidates for substitution that have been replaced or are no longer discharged Following the adoption of Recommendation 2006/3, offshore oil and gas operators in UK waters have been required to complete an annual return confirming the use and discharge of offshore chemical products that are/or contain candidates for substitution, including information on those products replaced during the calendar year. The number of candidate for substitution offshore chemical products permitted for use and discharge each year (2010 to 2020) was compiled by the UK (based on annual return data submitted by permit holders) into three categories: phasedout completely; not phased out for some functions, applications and/or locations; or not phased-out. Thus identifying candidate for substitution offshore chemical products and substitution substances (substitutable substances) that have been and are actively being replaced by operators and suppliers. It should also be noted that not all permitted offshore chemical products will be used/and or discharged by the permit holder.

In total, 441 candidate for substitution offshore chemical products included in a chemical permit for use and/or discharge in UK waters were reported as being phased-out completely between 2010 and 2020. However, in 2020, 42 of those candidate for substitution offshore chemical products previously reported as being phased-out completely were either reported as not phased-out or not-phased out for some functions, applications and/or locations, with 16 out of the 42 products reported as discharged.

For the purpose of identifying candidates for substitution substances that have been phased-out completely it is necessary to analyse the data at the substance level, because specific substances can be present in more than one offshore chemical product. There has been a decrease in the number of substitutable substances identified for use on the chemical permits between 2010 and 2020 with some variation in the number of substances used between the years. In total 255 substitutable substances have been reported as being phased-out completely between 2010 and 2020. However, in 2020, 46 of those substitutable substances previously reported as phased out completely were either reported as not phased-out or not-phased out for some functions, applications and/or locations, of 46, 23 of those were not discharged.

In addition to analysing annual return data, the UK also collects data on the actual use and discharge of candidate for substitution offshore chemical products via the Environmental Emissions Monitoring System (EEMS). Table 1 provides an overview of candidate for substitution offshore chemical products and substitutable substances that were actually used and/or discharged between 2010 and 2020 and demonstrates the trend in the number of candidate for substitution offshore chemical products and substitutable substances used and discharged between 2010 and 2020.

Based on EEMS data, the use and discharge of substitutable substances on the UKCS has decreased between 2006 and 2020. The total use and discharge of substitutable substances in 2006 was 7,718,194 kg and 2,195,753 kg respectively. In 2010, use and discharge was 4,788,938 kg and 1,335,558 kg respectively, in 2016, it was 2,652,288 kg and 1,291,966 kg respectively and in 2020, it was 3,717,455 kg and 859,235 kg respectively. Although comparison of the data does not account for year on year differences in levels of offshore activity, the data does indicate an overall reduction in the discharge of substitutable substances between 2006 and 2020

Figure 1 illustrates that there has been an overall decrease in the quantity of substitutable substances used and discharged between 2006 and 2020. This appears to have levelled off with no obvious trends and some small variation in quantity discharged between years with discharges at their lowest level since 2006. The levelling of the use and discharge of candidate for substitution offshore chemical products and substitutable substances could be due to a number of reasons including:

- substances were reclassified as substitutable substances;
- candidate for substitution offshore chemical products replaced with more environmentally friendly or alternative candidate for substitution offshore chemical products;
- candidate for substitution offshore chemical products remaining on permits for contingency purposes;
- reintroduction of candidate for substitution offshore chemical products due to issues with non-substitution replacements;
- addition of substitutable legacy offshore chemical products to permits due to discharge in decommissioning operations;
- rebranding exercise by a supplier. Operators have used a combination of old and new names from 2017 to 2020;
- candidate for substitution offshore chemical product cannot be replaced for technical and/or safety reasons;
- continued use of existing stocks of a candidate for substitution offshore chemical product;
- the substitutable substance may be found in one or more offshore chemical product(s); and
- operators may use the same candidate for substitution offshore chemical products for different applications.

Some operators may also continue to discharge a candidate for substitution offshore chemical product when other operators have either

replaced or ceased discharging the product and is justified via technical justification reports in Appendix 1.

Table 1. Number of candidate for substitution offshore chemicalproducts and substitutable substances used and discharged based onEEMS data

	Number of products used	Number of products discharged	Number of substances used	Number of substances discharged
2010	262	262	264	226
2011	226	226	280	215
2012	235	235	279	228
2013	223	223	257	205
2014	191	191	254	179
2015	189	189	246	210
2016	172	172	210	166
2017	237	174	220	158
2018	269	185	244	168
2019	300	223	262	189
2020	267	196	247	182

Figure 1. The quantity of substitutable substances use and discharged on the UKCS based on EEMS data.



Candidates for substitution where the relevant regulatory authority is satisfied that there is currently no suitable alternative, including justification In 2020, 220 candidate for substitution offshore chemical products were included on a chemical permit for discharge on the UKCS. One or more operators reported that of the 220 offshore chemicals discharged, 26 were phased-out completely; therefore 194 offshore chemical products could be expected to be discharged in the future. Out of the 194, 28 were phased-out for some, functions, applications and/or locations and 166 were not phased-out.

Candidate for substitution offshore chemical products phased-out completely or phased-out for some functions, applications and/or locations were replaced with either an offshore chemical product containing no substitutable substance or for one of the following reasons:

- replaced in some applications only;
- operator changed chemical supplier;
- chemical product no longer certified for use offshore;
- substitution warning removed for the offshore chemical product;
- offshore chemical product only used in an unsuccessful trial;
- one off use of an offshore chemical product;
- no future use of the chemical product planned; and
- change of asset owner or Cessation of Production (CoP).

More than one return for a candidate for substitution offshore chemical product will have been received if more than one operator used the product. Of the 194 offshore chemicals products not phased-out for discharge: 48 trials had or were being undertaken for 34 offshore chemical products; for the other 155 offshore chemical products there were 283 statements of no trials being undertaken to find a suitable alternative. Please note some operators stated they were trialling replacements for a particular candidate for substitution offshore chemical product, whereas other operators using the same offshore chemical product stated they were not trialling replacements.

Technical justification reports for the continued use and discharge of the 194 candidate for substitution offshore chemical products not phased out for discharge can be found in Appendix 1.

Overview of the measures taken to reduce use or discharge of chemicals with no suitable alternative	Following adoption of Recommendation 2006/3, the UK implemented a national plan for the phase-out of offshore chemicals containing candidates for substitution or the reduction and phase-out of discharges. A number of measures have been implemented by offshore operators, chemical manufacturers and suppliers to reduce the use and discharge of candidates for substitution:
	 reformulation of existing offshore chemical products resulting in the removal of the substitution warning; further environmental testing resulting in the removal of the substitution warning; research and development into alternative offshore chemical products, including trials of alternatives; replacement of candidate for substitution offshore chemical products are substitution offshore chemical

- products with non-substitution offshore chemical products;
 cessation of use of substitution offshore chemical products;
- cessation of discharge of substitution offshore chemical products;
- offshore operators using multiple suppliers instead of one supplier to avoid candidates for substitution; and
- one-off use or trial of substitution offshore chemical products.

Research and development and trials are undertaken to determine the suitability of potential replacement offshore chemical product(s) and information is summarised within the Technical justification reports in Appendix 1.

Please provide information on:

a. specific measures taken to give effect to this recommendation;

The UK publishes a list of all offshore chemical products currently registered for use on the UKCS, which confirms whether the offshore chemical products are, or contain, a Candidate for Substitution. Operators intending to use offshore chemical products on the UKCS are additionally provided with a template that also confirms whether the product is, or contains, a Candidate for Substitution. The UK had previously produced a National Plan for the reduction of the use and discharge of all offshore chemical products that have been assigned a substitution warning, and details of the plan were included in the UK paper submitted to OIC 2007 (OIC 07/3/6-E). The UK continues to review data, in line with objectives of HMCS, HOCNF Guidelines and this OSPAR Recommendation, that has been provided in support of offshore chemicals registered for use in UK waters on the UK's Offshore Chemicals Notification Scheme database. Taking this approach has resulted in offshore chemical products being reclassified as containing a candidate for substitution, when previously not so.

b. Any special difficulties encountered, such as practical or legal problems, in the implementation of this measure;

No specific difficulties have been encountered; however the following observations are relevant:

- Operators in the UK do not have access to substance level information and therefore can only report against offshore chemical products assigned a substitution warning (a product that is, or contains, a Candidate for Substitution). The focus of the Recommendation on substances that are Candidates for Substitution means that substance level data has to be collated based on operators returns on the chemical products. Therefore, substance level data has to be extracted for each product from the UK Offshore Chemical Notification Scheme database.
- Annual returns provided by operators cover a calendar year. EEMS data will be reported when a term permit has expired or every quarter for production permits and therefore EEMS use and discharge data for a product could cover more than one calendar year depending on operation type, therefore if can be difficult to draw direct comparisons between data sets.
- Some operators appear to have reported products as being replaced when it was not used during a calendar year. Therefore, there is uncertainty as to whether or not a product considered to have been phased out will not be used and/or discharged in the future by the same operator that had previously reported the product as being phased out.
- Chemical manufacturers have renamed chemical products with or without reformulating the product, resulting in operators reporting against both old and new product names.
- Operators may continue to use up existing purchased stocks of a substitution product rather than investigating alternatives.
- c. any programme of review of authorisations for the discharge of candidates for substitution, and the progress of such reviews;

All authorisations for chemical use and discharge (UK 'Chemical Permits') must be supported by an annual report detailing the Candidates for Substitution that are still in use, any trials that have been undertaken to seek replacements and any Candidates for Substitution that have been replaced. These reports are reviewed on an annual basis to inform discussion of the phase-out of offshore chemicals that are, or contain, Candidates for Substitution.

Appendix 1

UK Technical Justification Reports

During 2020, 220 offshore chemical products that are, or contain substances that are, identified as 'Candidates for Substitution', were discharged on the UK Continental Shelf (UKCS). Of the 220 chemicals discharged, 26 of the chemicals had been phased-out completely, 28 had been phased-out for some applications and 166 had not been phased-out.

Of the chemicals phased out for all or some applications, there were a number of reasons provided for the changes:

- Replaced with a chemical containing no substitutable substance;
- Discontinued use of a chemical;
- One-off use of chemical;
- Chemical used in an unsuccessful trial;
- Cessation of Production (CoP);
- Chemical re-assessed and substitution warning removed;
- Chemical no longer certified for offshore use;
- Operator changed chemical supplier;
- Change of asset owner and chemical strategy.

Of the 189 chemicals still in use, most were not replaced for either technical or safety reasons. Operator returns confirmed that 48 trials had been, or were being, undertaken to replace chemicals; 283 returns indicated that no trials had been undertaken.

Technical Justification Reports (TJRs) for the 194 discharged chemicals are provided below:

17 ppg Export NeoSuperSlurry System

Product Information		
Registered Chemical Name	17 ppg Export NeoSuperSlurry System	
Supplier	Neo Products, LLC	
Registered Category	Gold	
Function/Application	Cement or Cement Additive	
Use	Used during well intervention and production operations as a specialist cement system. Increases the life expectancy of the bridge plug and can also be used to set a water shut-off plug	
Discharge phased out	 N/A Product used by several operators. The operator responsible for the discharge in 2020 has transferred the assets to another operator who did not use or discharge the product in 2020. 	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	Has the ability to withstand high temperatures and prevents the migration of hydrocarbons to the surface.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: Laboratory testing to identify an alternative product is ongoing and yet to be completed. Research work is ongoing into alternative chemistries. 	

1. Biodegradation <20%
2. Biodegradation <20%

AFMR19149A		
Product Informati		

Product Information	
Registered Chemical Name	AFMR19149A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Antifoam (Hydrocarbons)
Use	Used during production operations as an antifoam designed to improve the oil/water interface and avoid liquid being carried over into the production/ gas processing facilities.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Best technically available antifoam specifically designed to reduce foam within the hydrocarbon streams. Not interchangeable with antifoams used in other systems.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Difficult to replace with substitution free alternative products that perform to the same standard.

AFMR19242A	

Product Information		
Registered Chemical Name	AFMR19242A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Silver	
Function/Application	Antifoam (Hydrocarbons)	
Use	Used during production and drilling operations as an antifoam designed to improve the oil/water interface and avoid liquid being carried over into the production/ gas processing facilities.	
Discharge phased out	 N/A One operator states zero discharge One operator has removed product from permit on one installation. One operator has replaced with AFMR20360A 	
chemicals	AFMIK20360A	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Reduces foam in produced fluids and the risk of fluid carryover, thus reducing the risk of process upsets and damage to compressors.	
Reason(s) for non- replacement	 Compatibility issues with alternative Awaiting trial (installation/supplier) Other 	
Evidence in support of continued discharge	 Compatibility issues with alternative: Alternative products cause process difficulties and decrease in performance. Awaiting trial (installation/supplier): Trials of alternative products are considered to be of low priority due to infrequent use of incumbent. One operator plans to replace with an alternative product subject to laboratory testing and field trials. Other: Substitution free alternative product, Defoamer AF360 was trialled. The volume required to control foaming was twice that of the incumbent and was unsustainable. Alternative products are available but also have substitution warnings Incumbent has proven to be more effective at lower dose rates than alternative products. 	

<u>AFMR20119A</u>		
Product Information		

Registered Chemical Name	AFMR20119A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Antifoam (Hydrocarbons)	
Use	Used during production operations as an antifoam designed to prevent liquid carryover into the processing stream. Also used to alleviate foam or emulsions formed with the produced water when flowing oil from the reservoir prior to separation and flaring during clean-up.	
Discharge phased out	N/A	
Replacement chemicals	 FOAMTREAT 12201 One operator replaced with FOAMTREAT 12201 in 2019. 	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Reduces the risk of process upsets which can result in production shutdown due to fluid carryover.	
Reason(s) for non- replacement	8. Other	
Evidence in support of continued discharge	 Other: An effective defoamer is required should oil drop-out during flaring become a problem. 	

Antifoam Agent D175A Product Information

Product information	
Registered Chemical Name	Antifoam Agent D175A
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive. Added to the water prior to the addition of cement preventing foam formation in the slurry. Specifically formulated to be effective in GASBLOK* systems.
Discharge phased out	N/A
Replacement chemicals	 Liquid Antifoam B411 and Liquid Antifoam D242 Alternative products, Liquid Antifoam B411 and Liquid Antifoam D242 have limitations of use in certain cement formulations.
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Prevents foaming or entrapped air, which can pose operational issues that results in lost of pump efficiency. Foaming can also affect slurry properties causing a potential risk to personnel, the environment and equipment.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Substitution free alternative products, Liquid Antifoam B411 and Liquid Antifoam D242, are not effective and have limitations of use in GASBLOK* systems, therefore the incumbent is still required under these conditions.

 Biodegradation <pass and="" log="" pow="" rate="">3</pass>
 Biodegradation <pass and="" log="" pow="" rate="">3</pass>
3. Biodegradation <20%

Antifoaming Agent D206 Product Information

Product Information		
Registered Chemical Name	Antifoaming Agent D206	
Supplier	Schlumberger Oilfield UK Plc	
Registered Category	Gold	
Function/Application	Cement or Cement Additive	
Use	Used during drilling and well intervention operations as a cement additive. Added to the water prior to the addition of cement to preventing foam formation in the slurry. Specifically formulated to be effective in GASBLOK* systems.	
Discharge phased out	 N/A One operator has replaced with Antifoam Agent D175 	
Replacement chemicals	Antifoam Agent D175A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Prevents foaming or entrapped air, which can pose operational issues that results in lost of pump efficiency. Foaming can also affect slurry properties causing a potential risk to personnel, the environment and equipment.	
Reason(s) for non- replacement	8. Other	
Evidence in support of continued discharge	 Other: Substitution free alternative product, Liquid Antifoam D242, is not effective and has limitations of use in GASBLOK* systems, therefore the incumbent is still required under these conditions. 	

1. Biodegradation <pass <10ppm<="" and="" rate="" th="" toxicity=""></pass>	
2. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>	
3. Biodegradation <pass and="" log="" pow="" rate="">3</pass>	
4. Biodegradation <20%	
5. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>	

Atlas Pig	3
Product	Inform

Product Information	
Registered Chemical Name	Atlas Pig
Supplier	SANCCUS LIMITED
Registered Category	Gold
Function/Application	Pipeline Pigging Chemical
Use	Used during pipeline operations as a gel pig for pipeline pigging.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	The substance which is subject to the substitution warning is widely used in this application and at present there are no other suitable alternative substances.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: During tests a potential alternative product did not perform as expected and testing was discontinued. Used in short-term operations and quantities of anticipated discharge are relatively small.

BARACO	R	100	
Product	In	forr	nati

Product information	
Registered Chemical Name	BARACOR 100
Supplier	Baroid Drilling Fluids (Halliburton Manufacturing and Services Ltd.)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during drilling operations as a corrosion inhibitor designed for completion or packer fluids due to its effectiveness in both monovalent and divalent brines and high pressure, high temperature (HPHT) environments.
Discharge phased out	N/A
Replacement chemicals	 BARACOR 700E BARACOR 700E is not suitable for use with divalent brines.
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Application deemed critical for integrity reasons to provide the required level of protection in the HPHT conditions of the subsea pipework.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Alternative product, BARACOR 700E, with better environmental properties was identified, however, it is not effective for divalent brines as the incumbent. Previous research and development programme to replace BARACOR 100, with alternative products indicated that to meet the technical performance in divalent brines, environmental properties and health and safety would be challenging. None of the chemistries investigated was as effective as the incumbent.

I. Biodegradation <20%	
2. Biodegradation <20%	

BIOC16633A

Product Information	
Registered Chemical Name	BIOC16633A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Biocide
Use	Used in production and pipeline operations as a biocide to prevent and control bacteria levels within the seawater systems and process plants.
Discharge phased out	 N/A One operator is removing the product from use.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Regular biocide treatments are necessary to prevent microbially induced corrosion that lead to problems with asset integrity. Prevents hydrogen sulphide formation from bacterial by product and reservoir souring.
Reason(s) for non- replacement	 No suitable alternative Trial ongoing Other
Evidence in support of continued discharge	 Trial Ongoing: One operator is trialling different combinations of biocide treatment to find which provides optimal protection.
	 Supplier currently testing and working to commercialise a substitution free alternative product. Substitution free alternative products are not as effective under extreme conditions at low dose rates as the incumbent.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

BIOC16718A

Product Information	
Registered Chemical	BIOC16718A
Name	
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Biocide
Use	Used in production operations to manage and control microbial activity and fouling.
Discharge phased	N/A
out	
Replacement	N/A
chemicals	
Trials Undertaken	No
(Yes or No)	
Justification for	Applied in various locations to provide protection to the subsea oil storage system and
continued use and	the produced water treatment package.
discharge	
Reason(s) for non-	1. No suitable alternative
replacement	8. Other
Evidence in support	Other
of continued	 Available green alternative products have been shown to be less effective.
discharge	 Trials of available alternative products are considered too high a risk and
	require to show improved performance before trials can be undertaken.
	•

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

BIOGEN Tuflube Product Information

Registered Chemical Name	BIOGEN Tuflube
Supplier	ROCOL
Registered Category	E
Function/Application	Jacking Grease
Use	Used during drilling and well intervention operations as a heavy duty jacking grease. Designed to protect slow moving mechanisms in the wettest and most corrosive conditions.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The lubricant protects jacking and open gear systems in marine, offshore and freshwater environments. Protection is essential to ensure the safety and maintenance of critical assets and maintain production.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Selected for use when it was substitution free. Additional data has been requested for the formulation as the product has gained a substitution warning. Additional information was submitted for consideration.

Reason why substance(s) are identified as a candidate for substitution

Bic	ogua	ard	Plus
_			-

Product Information		
Registered Chemical Name	Bioguard Plus	
Supplier	Wilhelmsen Chemicals AS	
Registered Category	Gold	
Function/Application	Other	
Use	Used during production operations to treat the cooling water and control marine growth, as an alternative to the electro-chlorination unit, when this unit is offline for maintenance or repair.	
Discharge phased out	 N/A To be removed from permit on one installation in 2021 as it will no longer be required. 	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	Prevents marine growth within the seawater system avoiding blockages of the filters or seawater exchangers. The system provides water to safety related systems, essential processes and platform cooling requirements.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: Research and development to identify alternative products is ongoing. Operator is considering reinstatement of Hypo unit to remove the requirement for this product. 	

BRIGHT GLIDE

Product Information		
Registered Chemical Name	BRIGHT GLIDE	
Supplier	M-I Drilling Fluids UK Limited	
Registered Category	Gold	
Function/Application	Drilling Lubricant	
Use	Used in drilling operations as a drilling lubricant designed to reduce the metal to metal friction when added to brines and completion fluids at low concentrations.	
Discharge phased out	 N/A One operator discharged well annulus fluids during scale squeeze operations. One operator has no plans to use in 2021. 	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Demonstrates superior reduction in metal to metal friction in critical drilling applications in comparison to alternative products.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Incumbent has better environmental classification than existing alternative products. Alternative products do not give the results required by operator for their drilling operations. 	

Reason why substance(s) are identified as a candidate for substitution

Brine Lubricant RX-72TL Broduct Information

Product Information	
Registered Chemical Name	Brine Lubricant RX-72TL
Supplier	Roemex Ltd
Registered Category	Gold
Function/Application	Brine (Completion)
Use	Used in drilling and well intervention operations as a drilling lubricant designed to reduce metal to metal friction in a variety of applications.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Significantly reduces the down-hole torque and drag forces exerted on subsurface strings.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Additional data has been requested for the formulation of the product. Operator is anticipating the removal of the recently assigned substitution warning if updated data is acceptable.

Reason why substance(s) are identified as a candidate for substitution

Cal Acid	
Product	Informat

Product Information	
Registered Chemical	Cal Acid
Name	
Supplier	Schlumberger Production Technologies
Registered Category	Silver
Function/Application	Scale Dissolver
Use	Used during drilling and well intervention operations as a scale dissolver as fast acting, non-corrosive, alternative product to conventional treatments of scales.
Discharge phased out	N/A
Replacement chemicals	 Cal Acid 2020 One operator will replace with Cal Acid 2020 when lower temperature conditions allow.
Trials Undertaken (Yes or No)	Yes
Trials Undertaken (Yes or No) Justification for continued use and discharge	Yes Specifically formulated to be a less corrosive alternative product for dissolving scales. Prevents possible corrosion failures in treated systems which in turn may lead to environmentally harmful discharges.
Trials Undertaken (Yes or No) Justification for continued use and discharge Reason(s) for non- replacement	Yes Specifically formulated to be a less corrosive alternative product for dissolving scales. Prevents possible corrosion failures in treated systems which in turn may lead to environmentally harmful discharges. 1. No suitable alternative 8. Other

 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>
2. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>

CARBOBOND® LITE® EU

Product Information		
Registered Chemical Name	CARBOBOND® LITE® EU	
Supplier	CARBO Ceramics, Inc.	
Registered Category	Gold	
Function/Application	Proppant	
Use	Used during production operations as a high performance proppant designed to keep production fractures open. It has a high cyclic loading tolerance and reduces the effective stresses encountered at deeper depths.	
Discharge phased out	 N/A Operator has removed from production permit as no longer required. 	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Effective at greater well depths, temperatures and stresses than other proppants in keeping production fractures open to optimise oil and gas recovery.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Research and development into suitable alternative products is on-going. Engineered to be durable and stable at down-hole conditions in aqueous and hydrocarbon bearing rock reaching high temperatures. 	

1. Biodegradation <20%
2. Biodegradation <pass and="" log="" pow="" rate="">3</pass>

Castrol BioBar 100

Product Information	
Registered Chemical Name	Castrol BioBar 100
Supplier	Castrol Limited
Registered Category	В
Function/Application	Hydraulic Fluid
Use	Used in drilling operations as a hydraulic fluid primarily within closed hydraulic systems.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Provides the correct lubricating and cooling properties for the cement unit and cuttings reinjection pumps. Reliable operation of these pumps is critical to safe drilling and completion operations.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: An alternative product is not yet available for trials. Only used in small quantities with discharge following dilution in cement slurry.

1. Biodegradation <20%
2. Biodegradation <20%
3. Biodegradation <20%
4. Biodegradation <20%
5. Biodegradation <pass and="" log="" pow="" rate="">3</pass>

CemFIT Shield D266

Product Information		
Registered Chemical Name	CemFIT Shield D266	
Supplier	Schlumberger Oilfield UK Plc	
Registered Category	Gold	
Function/Application	Cement or Cement Additive	
Use	Used in drilling operations as a cement additive improves zonal isolation in wells drilled with non-aqueous fluid especially in long horizontal wells.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	During stimulation interacts with any remaining mud to reduce mud mobility and communication along channels reducing pressure.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: There is currently no substitute available. Compatible with conventional equipment, blending processes, additives, laboratory testing and design considerations, making it easy to use in field. 	

Reason why substance(s) are identified as a candidate for substitution

Chelating Agent U42

Product Information	
Registered Chemical	Chelating Agent U42
Name	
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Other
Use	Used in well intervention operations as a well stimulating chemical. Designed to prevent precipitation.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Effective in preventing precipitates from forming in oil or gas wells, thus maintaining well flow and production.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Product is especially useful in acidizing water-injection wells.

Reason why substance(s) are identified as a candidate for substitution

Product Information	
Registered Chemical Name	CLAR10628A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to aid the separation of dispersed oil from the produced water.
Discharge phased out	 N/A One operator to remove from permit in 2021 as no longer required.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used to help meet oil in water (OIW) legislative limits in production water prior to discharge.
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 5. Awaiting trial (installation/supplier) One operator completed bottle testing in 2020 and an alternative chemistry is waiting to be field trialled.
	 Other: One operator plans to review the separation process chemicals and bottle test in 2021. Existing stock on an installation is sufficient to undertake preparation for decommissioning activities. Used in a contingency in the event of severe plant / OIW issues. Offshore tests show the product to be a top performing deoiler. Currently not in use by one operator, however, remains on permit due to existing offshore stock.

Product Information	
Registered Chemical Name	CLAR13208A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to aid the separation of dispersed oil from the produced water.
Discharge phased out	 N/A One operator has removed from permit due to poor performance in trial.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used to help meet oil in water (OIW) legislative limits in production water prior to discharge.
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 5. Awaiting trial (installation/supplier) One operator completed bottle testing in 2020 and an alternative chemistry is waiting to be field trialled. Other: One operator plans to review the separation process chemicals and bottle test in 2021. Existing stock on an installation is sufficient to undertake preparation for decommissioning activities. Currently not in use by one operator, however, remains on permit due to existing offshore stock.

<u>CLAR13281A</u>

Product Information	
Registered Chemical Name	CLAR13281A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Deoiler
Use	Used in production operations as a deoiler, to improve the removal of oil from the produced water prior to re-injection or discharge to sea.
Discharge phased out	 N/A One operator has removed from permit due to poor performance in trial.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Used to help meet oil in water (OIW) legislative limits in production water prior to discharge.
Reason(s) for non- replacement	4. Trial ongoing5. Awaiting trial (installation/supplier)8. Other
Evidence in support of continued discharge	 Trial ongoing : Supplier proposed alternative products could not be trialled due to Covid-19 restrictions. Work is on-going to see if product is still required. Awaiting trial (installation/supplier): Trials of alternative product, WT-510, planned for February 2020 were postponed due to offshore restrictions and Covid-19. Other:
	 One operator plans to review the separation process chemicals and bottle test in 2021. Currently not in use by one operator, however, remains on permit due to existing offshore stock. Bottle testing in 2019 by one operator did not identify a substitution free alternative. Alternative product, WT-1432, was trialled in May 2019. Results showed little improvement in performance compared to the incumbent.

Reason why substance(s) are identified as a candidate for substitution

Product Information	
Registered Chemical Name	CLAR16028A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Deoiler
Use	Used in productions operations as a deoiler to mitigate against the formation of stable emulsions and maintain oil in water (OIW) concentrations below OIWlimits.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Application of deoiler is necessary to maintain the OIW concentration below the legal limit while accommodating changing process conditions/process upsets.
Reason(s) for non- replacement	 Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Offshore laboratory trials in 2019 showed incumbent was a top performing deoiler. Trial cleaning of the mechanical oil removal process equipment took place allowing installation to operate without deoiler requirements. Supplier to investigate substitution free alternative products on one installation in September 2021. Other: Offshore bottle tests for alternative deoilers by the supplier on one installation was cancelled due to Covid-19. Remains on installations as a contingency product in event of severe OIW issues.

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

CLAR16036A

Product Information	
Registered Chemical Name	CLAR16036A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Deoiler
Use	Used in productions operations as a deoiler to mitigate against the formation of stable emulsions and maintain oil in water (OIW) concentrations below OIW limits.
Discharge phased out	 N/A One operator no longer using due to Cessation of Production.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The application of deoiler is necessary to maintain the OIW concentration below the legal limit while accommodating changing process conditions/process upsets.
Reason(s) for non- replacement	 No Suitable alternative Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Trials by one operator to compare the efficiency of the incumbent and any alternative products was cancelled in 2020 due to Covid-19 restrictions; these have been rescheduled for 2021. Offshore laboratory trials in 2019 showed that existing products were the top performing deoilers. Trial cleaning of the mechanical oil removal process equipment took place allowing installation to operate without deoiler requirements. Supplier to investigate substitution free alternative products on one installation in September 2021. Other: Previous bottle tests were carried out to evaluate the technical performance of alternative de-oiler products for one installation, no products were found that performed as well as the incumbent. A field trial of alternative product, CLAR10570A, was completed in May 2019 and indicated the incumbent deoiler has a wider operating band for dealing with OIW upsets. Offshore bottle tests for alternative deoilers by the supplier on one installation were cancelled due to Covid-19. Remains on installations as a contingency in event of severe OIW issues. The type of chemistry involving the incumbent attracts a substitution warning. The supplier is working to source alternative chemistries that will not attract a substitution warning.
	introduced until chemical contract tendering is completed.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

Cleartron KZB-282

Product Information	
Registered Chemical	Cleartron KZB-282
Name	
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Deoiler
Use	Used during production operations as a deoiler to reduce the traces of oil in produced water to ensure overboard water meets the legislative discharge specification.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used to help meet oil in water (OIW) legislative limits in production water prior to discharge as a replacement product for EC6036A due to stability problems.
Reason(s) for non- replacement	5. Awaiting trial (installation/supplier)
Evidence in support of continued discharge	 Awaiting trial (installation/supplier: Field trial of alternative product, FLOCTREAT 7550, is proposed for 2021.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

Product Information	
Registered Chemical Name	CORR01002A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor designed to prevent corrosion and associated pipework failure in the heating/cooling systems.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Corrosion protection must be applied to the heating and cooling systems to maintain integrity. It is not possible to replace this product due to the exotic metals in the system. The product is applied as needed to keep the residual nitrite levels in the system within specification.
Reason(s) for non- replacement	 No suitable replacement Other
Evidence in support of continued discharge	 Other: One operator has been unable to conduct a full drain down and online filtration of the system to allow replacement of the incumbent with an alternative product. A substitution free alternative product has not been identified due to compatibility issues with the metallurgy present within the closed loop system. Used by one operator from 2020 as an alternative product to EC1188A due to supply issues.

1. Biodegradation <20%
2. Biodegradation <20%
3. Biodegradation <20%
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
5. Biodegradation <20%

Product Information	
Registered Chemical Name	CORR10003A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	C
Function/Application	Corrosion Inhibitor
Use	Used in production operations in closed loop systems as a corrosion inhibitor to prevent corrosion within the heating and cooling medium systems.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents integrity failure in heating and cooling medium systems by controlling corrosion.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: No work is currently ongoing to develop an alternative product due to current research and development priorities. Used in closed loop systems with minimal chemical discharge. The mixed chemical allows ease of replenishment of large volumes of heating and cooling medium without the manual mixing of separate chemicals.

_

1. Biodegradation <20%
2. Biodegradation <20%

CORR10633A Product Inform

Product Information	
Registered Chemical Name	CORR10633A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor to prevent corrosion in subsea pipelines and control corrosion rates in production systems.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Has been in use for many years and is proven to be effective in preventing corrosion and maintaining the intergrity of subsea pipelines.
Reason(s) for non- replacement	 No suitable alternative. Other
Evidence in support of continued discharge	 Other: Has been extensively optimised by operators to prevent corrosion.

Reason why substance(s) are identified as a candidate for substitution

Product Information		
Registered Chemical Name	CORR10929A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor to control corrosion throughout the production process and crude oil export line.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	There is no suitably qualified replacement for this product and it must be applied to protect the integrity of the pipelines.	
Reason(s) for non- replacement	8. Other	
Evidence in support of continued discharge	 Other: Two potential corrosion inhibitors have been identified which meet the inhibition requirement of the installation flow line, which are compatible with the incumbent. Results from tests at the supplier are due March 2021, if successful, the products will progress to independant verification. 	

1. Biodegradation <pass <10ppm<="" and="" rate="" th="" toxicity=""></pass>
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
3. Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
CORR10990A

Product Information	
Registered Chemical Name	CORR10990A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor designed to protect the topsides, subsea pipework and export pipelines from corrosion failures.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Prevents corrosion to maintain the integrity of topsides, subsea pipework and export pipelines.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Installations are entering Cessation of Production (COP) in 2020 and 2021 and existing stocks of incumbent are sufficient for use during the decommissioning activities. Proposed replacement testing is under review. Supplier has been working towards creating new corrosion inhibitors with better environmental characteristics, however, there is no anticipated timeline for suitable replacements.

-

 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass> 	
2. Log Pow >3 and Toxicity <10ppm	

CORR11011B	
Product Information	

rioduce information		
Registered Chemical Name	CORR11011B	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor applied to protect the feed gas cooler and prevent fouling in low-pressure gas compressor systems.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	Has been effective in extending the life and improving the performance of the gas compressor systems failure would result in more gas being flared from the platform.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: One operator continues to stock product for contingency use. Installations are entering Cessation of Production (COP) in 2020 and 2021 and existing stocks of incumbent are sufficient for use during the decommissioning activities. The supplier is working to source alternative chemistries that will not attract a substitution warning. 	

1. Biodegradation <Pass rate and Log Pow >3

CORR11389A	
Product Information	۱

Registered Chemical Name	CORR11389A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	C	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor. Added to the cooling/heating medium to maintain nitrite and pH levels preventing corrosion within the system.	
Discharge phased out	 N/A One operator has replaced with a substitution free product from a different supplier. One operator states zero discharge to marine environment. One operator currently using EC1188A as a replacement product, which will be replaced by CORR01002A subject to qualification 	
Replacement chemicals	EC1188A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	Corrosion protection must be applied to the heating and cooling systems to maintain integrity. It is not possible to replace this product due to the exotic metals in the system.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: One operator has changed supplier and potential replacement product, Versalis e[®]-cori 373 R, has been proposed for field trial. Systems into which this product is applied are termed as 'closed' systems. However top ups are required due to losses through degradation, evaporation and the procss which result in subsequent discharge to sea. Product is used in small volumes and any discharges are infrequent. One operator is using exisiting stocks. A substitution free alternative product has not been identified due to compatibility issues with the metallurgy present within the closed loop system. Subject to continuing development and review and work is on-going to develop an alternative product. 	

1. Biodegradation <20%	
2. Biodegradation <20%	

CORR11426A

Product Information		
Registered Chemical Name	CORR11426A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during production and pipeline operations as a corrosion inhibitor designed to mitigate against corrosion in subsea flowlines. Provides protection in high pressure, high temperature (HPHT) and high shear conditions.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Application of this product is deemed critical for integrity reasons as it provides the required level of protection in the HPHT and high shear conditions of operators pipelines, tanks and other production tubulars.	
Reason(s) for non- replacement	 No suitable alternative Trial ongoing Other 	
Evidence in support of continued discharge	 Trial ongoing: Testing of alternative products are ongoing at field. Incumbent may be only corrosion inhibitor suitable for use. Other: Incumbent has excellent application record supported by inspection data. Therefore the time scale and economics for replacement before Cessation of Production are unrealistic. Able to withstand long-term storage at sea bed temperatures. 	

 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>

<u>CORR11571A</u>		
Product Information		

Registered Chemical Name	CORR11571A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor and is required due to the corrosion tendency of produced fluids.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents corrosion to maintain the intergrity of topsides, subsea pipework and export pipelines.
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Potential alternative products are awaiting trials at the supplier.

CORR11589A	
Product Informatio	

Product information	
Registered Chemical Name	CORR11589A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor. Designed to protect the topsides and subsea pipework from corrosion failures.
Discharge phased out	N/AOne operator has removed from permit.
Replacement chemicals	 N/A Product was re-certified in August 2020 and the substitution warning was removed.
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	 Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Trials by one operator are pending prior to stock reduction on installation and delays in trialling due to Covid-19. Incumbent is to be replaced with a suitable product from another supplier, that has not currently been tested.
	 Other: Product was re-certified in August 2020 and the substitution warning was removed.

<u>CORR12</u>	617A
Dura alternati	1

Product Information	
Registered Chemical Name	CORR12617A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor. Applied to the satellite wellheads, gas production manifolds and various process locations to provide corrosion protection for the carbon steel pipework.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: One operator has changed supplier and potential replacement product, Versalis e[®]-cori HG10 R, has been proposed for field trial.

Product Information	
Registered Chemical	CORR17030A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor designed to protect the integrity of the carbon steel pipelines from corrosion.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	High CO_2 levels and on-going operational challenges with the deposition of naphthenates require a corrosion inhibitor with a proven synergy with other production chemicals.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Substitution free product, CORR12452A, was trialled during 2020. Its performance was poor in comparison to the incumbent resulting in very high oil in water (OIW) concentration.

 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>

3. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

Corrosion Inhibitor B559 Product Information

Product Information	
Registered Chemical Name	Corrosion Inhibitor B559
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used in drilling and well intervention operations as a corrosion inhibitor to protect low- alloy carbon and 15% chrome steels.
Discharge phased out	 N/A Two operators have replaced with substitution free Corrosion Inhibitor B661.
Replacement chemicals	Corrosion Inhibitor B661
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Suitable for use to protect low-alloy carbon and 15% chrome steels from corrosion and pitting, thus maintaing integrity.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Trials to replace incumbent have shown that Corrosion Inhibitor B661 provides good corrosion rate inhibition, however it has not been tested for corrosion inhibition with other acid systems. Continued use due to suitability for use in systems. . One operator expects to be able to replace incumbent with substitution free product, Corrosion Inhibitor B661.

Reason why substance(s) are identified as a candidate for substitution

|--|

Product Information	
Registered Chemical Name	Corrtreat 705
Supplier	Clariant Oil Services UK Ltd
Registered Category	Silver
Function/Application	Pipeline Hydrotest Chemical
Use	Used during production operations as a corrosion inhibitor, applied to the flowline to protect from corrosion and bio-fouling.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Application is deemed critical for integrity reasons.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Due to age of the subsea pipeline and infrastructure, the critical nature of this application and assessing future severe conditions qualification of new inhibitor is complex and robust. Initial screening work has been completed, the replacement testing required will be extensive and includes umbilical material compatibility testing. Testing is to be completed sometime in 2021, followed by squirt test and change out. Although this product was not developed specifically for this application, it performed best in corrosion inhibitor efficiency testing.

1. Biodegradation <pass <10ppm<="" and="" rate="" th="" toxicity=""></pass>
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>

CORRTREAT 7073

Product Information	
Registered Chemical Name	CORRTREAT 7073
Supplier	Clariant Oil Services UK Ltd
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor, designed to maintain the integrity of the export pipeline.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Application is deemed critical for integrity reasons.
Reason(s) for non- replacement	 No suitable alternative Operational constraints by third party Other
Evidence in support of continued discharge	 Operational constraints by third party: Replacement product has been identified and is awaiting approval from pipeline operator.
	 Other: Alternative substitution free products have been identified by current supplier and another vendor. No laboratory trials have been carried out as the economics of testing are prohibitive. A review of test results indicated the proposed replacement corrosion inhibitor required significantly increased chemical usage compared to the incumbent to achieve the target corrosion rate. The integrity of the export pipeline has been maintained due to the effectiveness of the incumbent product and the current integrity management programme. The performance has been verified by an Intelligent pigging campaign carried out in 2015. Changing the export corrosion inhibitor introduces significant integrity unknowns for the pipeline in the medium to long term. Trial of alternative product, MULTITREAT 16740, was unsuccessful, bottle tests suggested a decrease in oil in water performance and this was also witnessed during trial. CORRTREAT 7073 is the new name for TROS C787C.

1. Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
2. Log Pow >3 and Toxicity <10ppm
3. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>

Product Information	
Registered Chemical Name	Corrtreat 77-780
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production and pipeline operations as a corrosion inhibitor to provide long term protection of subsea pipelines and flowlines ensuring integrity.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Provides corrosion protection to subsea pipelines requiring chemical inhibition, is deemed critical for integrity reasons.
Reason(s) for non- replacement	5. Awaiting trial (installation/supplier) 8. Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier) Trial of a potential replacement product, CORR10974A, has been delayed due to the Covid-19 and has been rescheduled for 2021. Other: Due to the flowlines exceeding their design life, any product change may
	significantly increase risk to the integrity of the system.

CORRTREAT 799

Product Information	
Registered Chemical	CORRTREAT 799
Name	
Supplier	Clariant Oil Services UK Ltd
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor injected into subsea wells to maintain integrity of the flowlines.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Required to achieve Basic Sediment and Water (BS&W) and Oil in Water (OIW) targets and maintain the integrity of the flowlines.
Reason(s) for non- replacement	 No suitable alternative Compatibility issues with alternative
Evidence in support of continued discharge	 Compatibility issues with alternative: Replacement product, CRW85735UC, showed process instability, incumbent was reinstated. Risk of significant impact both on production and operational expenditure on use of alternative.

1. Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>	
 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>	
3. Log Pow >3 and Toxicity <10ppm	

<u>Cortron®</u>	[®] RN-617
Product	Informatio

Product information	
Registered Chemical Name	Cortron [®] RN-617
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor. Applied to the satellite wellheads, gas production manifolds and various process locations to provide corrosion protection for the carbon steel pipework.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Laboratory testwork and final technical review of the potential identified candidates with the supplier was completed. In January 2021 a new substitution free corrosion inhibitor, CORR22617A, was selected as a replacement product. Awaiting final laboratory tests before change out is initiated, no trials are currently planned.

.

Product Information	
Registered Chemical Name	CRW83133
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor designed to protect metallic surfaces in surface and down hole equipment preventing corrosion of pipelines.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Data has been collected for supplier to carry out laboratory work in 2021. Installation has ceased production. The chemical has been retained on installation permit as there may be a requirement for the incumbent to be used in 2021 for pipeline flush and protection during CoP.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

Product Information	
Registered Chemical	CRW85194
Name	
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor injected into wellheads, gas lift wells, pipelines, topside processes and storage cell rundown lines from corrosion.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.
Reason(s) for non-	1. No suitable alternative
replacement	8. Other
Evidence in support of continued discharge	 Other: This is the only product that fulfils the strict corrosion inhibition requirements for the wells. This is the only product that currently works with the Kinetic Hydrate Inhibitor (KHI) used in the field. Work is ongoing to qualify a substitution free Anti-Agglomerant (AA) and is expected to be completed by the end of 2020. If successful this would allow the selection of a potentially substitution free corrosion inhibitor, however replacement is only possible if the KHI is replaced. Product will not be replaced due to impending Cessation of Production.

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

CRW854	06
Droduct	Informatio

Product Information	
Registered Chemical Name	CRW85406
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production and pipeline operations as a corrosion inhibitor to provide long term protection of subsea pipelines and flowlines ensuring integrity.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Residual product remains in the chemical injection umbilical post Cessation of Production. A single discharge of product will occur during umbilical flushing operations.

Product Information	
Registered Chemical Name	CRW85440
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor to protect against corrosion in subsea carbon steel pipelines.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Product is the only corrosion inhibitor that was found to be compatible with the Kinetic Hydrate Inhibitor (KHI) which was determined to be the only KHI suitable for the field conditions after a best in class qualification programme was carried out. Work is ongoing to qualify a substitution free Anti-Agglomerant (AA) and is expected to be completed by the end of 2020. If successful this would allow the selection of a potentially substitution free corrosion inhibitor, however replacement is only possible if the KHI is replaced.

 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass> 	
2. Log Pow >3 and Toxicity <10ppm	

Product Information		
Registered Chemical Name	CRW85689	
Supplier	Baker Hughes Limited	
Registered Category	Silver	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor designed to provide long term protection of carbon steel subsea infrastructure and associated topside pipework.	
Discharge phased out	N/A	
Replacement chemicals	CRW88162Replacement by one operator is on-going.	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: Incumbent was awarded a substitution warning in September 2020 and has undergone tests at the supplier to demonstrate it passes criteria to remove the substitution warning. Currently awaiting feedback on new test data. A substitution free replacement was trialled in 2018/19. The data generated was incomplete and a further field trial was recommended. Due to Covid-19 a further trial could not be carried out in 2020. Replacement with CRW88162 is on-going and will be completed at the end of Q1 2021. Was selected as best in class when evaluated against other similar corrosion inhibitors. Discharge occured during an operation to replace part of production pipeline. As the chemical is used in a closed loop system, futher discharge is not expected. 	

Product Information			
Registered Chemical Name	CRW85719		
Supplier	Baker Hughes Limited		
Registered Category	Gold		
Function/Application	Corrosion Inhibitor		
Use	Used during production operations as a corrosion inhibitor to provide long term protection of carbon steel subsea pipelines.		
Discharge phased out	N/A		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Νο		
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.		
Reason(s) for non- replacement	 No suitable alternative Operational constraints by third party Other 		
Evidence in support of continued discharge	 Operational constraints by third party: Product selected by a third party operator. Alternative product selection and replacement for subsea deployment is expected to take 1-2 years. Other: Incumbent was awarded a substitution warning in September 2020 and has undergone tests at the supplier to demonstrate it passes criteria to remove 		
	the substitution warning. Currently awaiting feedback on new test data.		

<u>CRW85735</u>

Product Information			
Registered Chemical Name	CRW85735		
Supplier	Baker Hughes Limited		
Registered Category	Gold		
Function/Application	Corrosion Inhibitor		
Use	Used during production operations as a corrosion inhibitor designed to provide long term protection of carbon steel subsea infrastructure and associated topside pipework.		
Discharge phased out	 N/A Not discharged at installation by one operator. 		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Νο		
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.		
Reason(s) for non- replacement	 No suitable alternative Other 		
Evidence in support of continued discharge	 Other: Incumbent was awarded a substitution warning in September 2020 and has undergone tests at the supplier to demonstrate it passes criteria to remove the substitution warning. Currently awaiting feedback on new test data. Test work of the product's performance has demonstrated its ability to adequately protect against corrosion. 		

Reason why substance(s) are identified as a candidate for substitution

<u>CRW85735UC</u>

Product Information	
Registered Chemical Name	CRW85735UC
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor designed to provide long term protection of carbon steel subsea infrastructure and associated topside pipework.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	Other:Chemical has only recently aquired a substitution warning.

Reason why substance(s) are identified as a candidate for substitution

Product information		
Registered Chemical Name	CRW85768	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor designed to provide long term protection of wellheads to protect their integrity.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Incumbent was awarded a substitution warning in September 2020 and has undergone tests at the supplier to demonstrate it passes criteria to remove the substitution warning. Currently awaiting feedback on new test data. Product was selected for use when it was substitution free and has been extensively optimised for use . 	

CR	W8	80	0	0	
_		-		_	

Product Information		
Registered Chemical Name	CRW88000	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor to control corrosion throughout the subsea flowline, production process and crude oil export line.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Selected as best in class when evaluated against other similar corrosion inhibitors. Incumbent was awarded a substitution warning in September 2020 and has undergone tests at the supplier to demonstrate it passes criteria to remove the substitution warning. Currently awaiting feedback on new test data. 	

<u>CRW88015</u>

Product Information		
Registered Chemical Name	CRW88015	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during production operations as a corrosion inhibitor to control corrosion throughout the production process and crude oil export line.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	The application of this product is deemed critical for integrity reasons.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: Selected as best in class when evaluated against other similar corrosion inhibitors. Incumbent was awarded a substitution warning in September 2020 and has undergone tests at the supplier to demonstrate it passes criteria to remove the substitution warning. Currently awaiting feedback on new test data. 	

Reason why substance(s) are identified as a candidate for substitution

D600G GASBLOK*Gas-Migration Control Additive Product Information

Product Information		
Registered Chemical Name	D600G GASBLOK*Gas-Migration Control Additive	
Supplier	Schlumberger Oilfield UK Plc	
Registered Category	Gold	
Function/Application	Cement or Cement Additive	
Use	Used during drilling and well intervention operations as a cement additive. Designed to prevent gas migrating through the cement when crossing gas zones at medium to high temperatures during the transition period of the cement.	
Discharge phased out	 N/A One operator has replaced with GASBLOK*Gas Migration Control Additive D620 	
Replacement chemicals	GASBLOK* Gas Migration Control Additive D620	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Provides protection against gas migration, which could significantly affect rig safety during drilling operations	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Alternative product, tested in December 2019, has also been awarded substitution rating. Currently there is not a more environmentally friendly alternative with the same technical performance and reliability. 	

Reason why substance(s) are identified as a candidate for substitution

DCA-17003	
Product Information	

i foddet information	
Registered Chemical Name	DCA-17003
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Other
Use	Used in well intervention operations as a cracking agent in acidising operations Proven to mitigate against hydrogen sulphide production during the dissolution of sulphide scales.
Discharge phased out	 N/A One operator has replaced with substitution free DCA-17009.
Replacement chemicals	DCA-17009
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Required to mitigate against hydrogen sulphide production and maintain integrity.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Acid stimulations during 2019 with the incumbent in conjuction with Barascav W-480 proved hydrogen sulphide production was minimised and allowed the wells to be flowed back through the process within the integrity limits set to prevent sulphide stress cracking. Also improves the performance of conventional acid corrosion inhibitors.

1. Biodegradation <Pass rate and Toxicity <10ppm

Product Information	
Registered Chemical Name	DCA-17006
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during drilling and well intervention operations as a corrosion inhibitor designed to minimise corrosion on surface and downhole metallic surfaces.
Discharge phased out	 N/A One operator has replaced with substitution free DCA-17009.
Replacement chemicals	DCA-17009
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential substance of any acid treatment and is critical for minimising integrity risks.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Successful in treating scale deposits. It has shown to adsorb onto the metallic surfaces providing effective corrosion protection to the pipeline. Incumbent is more environmentally friendly compared to others tested by the manufacturer.

DCA-22001

Product Information	
Registered Chemical Name	DCA-22001
Supplier	Halliburton Energy Services
Registered Category	Silver
Function/Application	Cement or Cement Additive
Use	Used in drilling, pipeline and well intervention operations as a cement additive. When used in conjunction with fluids, it penetrates into formations faciliting the dissolution of soluble materials. Can also used as a water wetting agent and compatibility aid for cementing spacers.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Reduces the volume of seawater required to clean pipelines below permitted oil in water (OIW) concentration.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Product is used to clean pig trains as part of pipeline decommissioning. Operator expects to remove product from permits as decommissioning activities finish. Continuous research is being conducted into alternative products which are technically equivalent but less toxic to the environment, none have been identified.

Reason why substance(s) are identified as a candidate for substitution

DF082773
Product Information

Registered Chemical Name	DF082773
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Antifoam (Hydrocarbons)
Use	Used during production operations as an antifoamrequired to prevent liquid carryover into the processing stream which can result in production shutdown.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Required to prevent foaming within the topsides separation process resulting in unstable level control, reduced vessel capacity, liquid carryover to the gas plant, compressor fouling and potential for process system shut-down.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Selected for use as best in class after laboratory testing of potential antifoams. Alternative supplier was unable to reproduce foaming condition during onshore lab testing to allow testing and performance comparisions of alternative products. Unsuccessful trial with a substitution free alternative product, trial report was provided in 2017. Bottle tests carried out by supplier have identified a potential substitution free alternative product. Field trials have not been carried out due to potential process upsets and a previous unsuccessful trial of substitution free deoiler and demulsifier. One operator has not prioritised replacement of incumbent due to relatively low usage and complexity of change out. One operator has not used, a small volume if required will be used.

DF085434	ļ
Product In	formati

Product Information	
Registered Chemical Name	DFO85434
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Antifoam (Hydrocarbons)
Use	Used during production operations as an antifoam for process separation to avoid liquid hydrocarbon carry over into the gas processing plant.
Discharge phased out	N/A
Replacement chemicals	 DFO82773 To be replaced with DFO82773 in 2021 as the incumbent will no longer be available.
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Critical for production to stop liquid carry over into gas compression, potentially causing damage leading, to significant down time for the asset.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Trials of alternative products comes with significant risk.

DFW43013

Product Information	
Registered Chemical	DFW43013
Name	
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Antifoam (Hydrocarbons)
Use	Used during production and well interventions operations as an antifoam which is used in conjunction with a foaming agent to restart gas production from liquid loaded wells.
Discharge phased out	 N/A Operator has removed from the permit on one installation
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Injected to prevent excessive foaming in the processing plant when high foam content well fluids return to the host installation. Thus preventing unstable level control and the potential for process system shutdown.
Reason(s) for non- replacement	5. Awaiting trial (installation/supplier)
Evidence in support of continued discharge	 Awaiting trial (installation/supplier) A substitution free alternative product, RX-5526, has been selected for field trial in 2021 on one installation. If successful the product will be rolled out to other installations belonging to the operator in relevant fields.

Reason why substance(s) are identified as a candidate for substitution

Product Information	
Registered Chemical Name	DFW80521
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Antifoam (Hydrocarbons)
Use	Used during production operations as an antifoam to prevent foaming in the de-aerator (DA) tower and maximise efficiency by removing entrained air fromseawater.
Discharge phased out	 N/A One operator has removed from the permit following Cessation of Production. One operator used for a one off foaming incident.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Risk of liquid hydrocarbon carry over to the gas handling systems which leads to unnecessary flaring of hydrocarbon material.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Low volumes of product are used therefore the chemical supplier is not investing in new technology.

 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>
2. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>
3. Log Pow >3 and Toxicity <10ppm
4. Biodegradation <20%
5. Biodegradation <20%
6. Biodegradation <pass and="" log="" pow="" rate="">3</pass>

Registered Chemical	DFW82243
Name	
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Antifoam (Water Injection)
Use	Used during production operations as an antifoam to reduce foaming in cooling systems as a result of gas/air being drawn into the expansion tank and dirty filters in amine systems. It is also applied to seawater injection systems to aid deoxygenation in the de-aerator (DA) tower to decrease corrosion of carbon steel pipework.
Discharge phased out	 N/A One operator removing from permit in 2021 following Cessation of Production. One operator used for a one off foaming incident.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for	Prevents issues in cooling, amine and de-aerator systems thus maintaining the safety
continued use and discharge	and integrity of pipework and essential systems required for continued production.
continued use and discharge Reason(s) for non- replacement	 and integrity of pipework and essential systems required for continued production. 1. No suitable alternative 8. Other

DIZZOLVE	
Product Infor	r

Product Information	
Registered Chemical	DIZZOLVE
Name	
Supplier	Apex Industrial Chemicals Limited
Registered Category	Gold
Function/Application	Scale Dissolver
Use	Used during production operations as a scale dissolver to remove radioactive scales from production plant and equipment.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Has a significant health and safety benefit over other scale dissolvers as it uses a unique technology that is reliable in removing radioactive scales without giving rise to inhalable radioactive dust. Scale build-up will impact on production and result in significant losses if not removed.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: One operator is investigating a range of alternative products from multiple suppliers with a view to improving the performance of this application. Incumbent does not form hydrogen sulphide when dissolving scale deposits. Two installations have entered Cessation of Production and will continue to use exisiting stock during decommissioning activities.

|--|

Product Information	
Registered Chemical Name	DM083582
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during production operations as a demulsifier applied on a continuous basis to aid the separation of oil and water.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Application of demulsifier is necessary to provide an operational buffer that facilitates the maintenance of the oil in water (OIW) concentration below the legal limit while accommodating changing process conditions and upsets.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: PHASETREAT 6252 was identified as a possible replacement product, but was more expensive than the incumbent and proceeded to obtain a substitution warning. Thus removing the environmental improvement compared to the incumbent. An improvement in OIW overboard quality was noted when MULTITREAT 12726 was introduced to inhibit scale. Incumbent is currently considered best in class. Performs significantly better at very low injection rates thus minimising the amount of product discharged into the marine environment.

1. Log Pow >3 and Toxicity <10ppm
 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>
DM086101

Product Information

Registered Chemical	DM086101		
Supplier	Baker Hughes Limited		
Registered Category	Gold		
Function/Application	Demulsifier		
Use	Used during production operations as a demulsifier to improve the separation of water from oil, and also to improve the separation of oil from water (OIW) reducing the burden on the produced water processing facilities.		
Discharge phased out	N/A		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Yes		
Justification for continued use and discharge	Application of demulsifier provides an operational buffer that facilitates the maintenance of the OIW concentration below the legal limit while accommodating changing process conditions and upsets.		
Reason(s) for non- replacement	 No suitable alternative Compatibility issues with alternative Other 		
Evidence in support of continued discharge	 Compatibility issues with alternative: Following bottle testing of 2 potential alternative products a field trial was carried out which showed poor performance in comparison with the incumbent. Further work is required to find a suitable alternative product. Other: Conditions of low temperatures and heavy oil restricts the number of potential replacement products. The incumbent is best in class for this installation. 		

DM086538

Product Information	
Registered Chemical Name	DM086538
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during production operations as a demulsifier to aid in the separation of water from the crude oil/produced water emulsion in the first stage separators.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Application of demulsifier provides an operational buffer that facilitates the maintenance of the oil in water (OIW) concentration below the legal limit while accommodating changing process conditions and upsets.
Reason(s) for non- replacement	 No suitable alternative. Other
Evidence in support of continued discharge	 Other: Bespoke trial product which gives a technically superior performance in laboratory tests to other currently available products.

Reason why substance(s) are identified as a candidate for substitution

 Biodegradation < Pass rate and Toxicity <10ppm
2. Log Pow >3 and Toxicity <10ppm
3. Biodegradation <20%
 Log Pow >3 and Toxicity <10ppm
4. Log Pow >3 and Toxicity <10ppm

DN	108	3657	71	
_				

Product Information			
Registered Chemical Name	DM086571		
Supplier	Baker Hughes Limited		
Registered Category	Silver		
Function/Application	Demulsifier		
Use	Used during production operations as a demulsifier to aid in the separation of oil and water topsides.		
Discharge phased out	N/A		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Νο		
Justification for continued use and discharge	Application of demulsifier provides an operational buffer that facilitates the maintenance of the oil in water (OIW) concentration below the legal limit while accommodating changing process conditions and upsets.		
Reason(s) for non- replacement	6. Unable to allocate time for trial(s)8. Other		
Evidence in support of continued discharge	 Unable to allocate time for trial(s): Replacement demulsifier has been previously identified but not trialled due to time constraints. As the process that requires this product remains stable and other processes are problematic it is hoped to replace the product in the future. Other: Contingency product to be trialled to aid the separation process on an 		
	 installation if the use of alternative product, DMO86958, is unsuccessful. No alternative demulsifier has been found that works with the installation's fluid chemistries. Product will not be replaced by operator due to pending cessation of production. 		

1. Biodegradation <Pass rate and Toxicity <10ppm

DM	086	6660)

Product Information			
Registered Chemical Name	DM086660		
Supplier	Baker Hughes Limited		
Registered Category	Silver		
Function/Application	Demulsifier		
Use	Used during production operations as a demulsifier required to enhance oil and water separation throughout the production system. Used as part of the suite of chemicals in the umbilical flush immediately following first oil to aid in separation.		
Discharge phased out	N/A		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Νο		
Justification for continued use and discharge	Application of demulsifier provides an operational buffer that facilitates the maintenance of the oil in water (OIW) concentration below the legal limit while accommodating changing process conditions and upsets.		
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other 		
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Demulsifier DMO86885 was trialled in 2013 its performance was not equivalent to the incumbent. Further bottle test work was carried out in April 2014 and a new alternative DMO86945 was proposed and trialled in Feb 2015. In July 2015 further trials found that alternate demulsifiers were individually less active. Previous work has identified a starting point for further trials. Field trials of revised versions of DMO86945 has been proposed, when pumping capability to blend products is available during the planned trial in 2021. Other: Technically superior in comparison to alternative products previously trialled in terms of reduction of oil concentration in water. 		

 Log Pow >3 and Toxicity <10ppm
 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>
 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>

DRISTEMP® POLYMER

Product Information	
Registered Chemical Name	DRISTEMP [®] POLYMER
Supplier	Drilling Specialties Company LLC
Registered Category	Gold
Function/Application	Fluid Loss Control Chemical
Use	Used in well intervention operations as a fluid loss control chemical in high temperature, high pressure (HPHT) water based drilling fluids, also be used to kill wells.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Currently the best available product to perform HPHT fluid loss in water based drilling fluids during drilling operations.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Operator will replace when alternative products are available for use in this type of application.

Reason why substance(s) are identified as a candidate for substitution

Dulon Eco Safe Rig wash

Product Information	
Registered Chemical	Dulon Eco Safe Rig wash
Name	
Supplier	Dulon International
Registered Category	Gold
Function/Application	Detergent / Cleaning Fluid
Use	Used during drilling and well interventions operations as a detergent required for cleaning decks.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	General detergent cleaner that is required in deck maintenance to remove the build- up of grease and oil grime and residue.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Selected for use when it was substitution free before operations began Additional information was submitted for consideration to demonstrate it passes criteria to remove the substitution warning.

Reason why substance(s) are identified as a candidate for substitution

EC1188/	1
Product	Inform

Product Information	
Registered Chemical Name	EC1188A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	A
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor designed to prevent corrosion and associated pipework failure in the heating/cooling systems.
Discharge phased out	 N/A Will be replaced by CORR01002A subject to suitable qualification information supplied by the supplier.
Replacement chemicals	CORR01002A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Corrosion protection must be applied to the heating and cooling systems to maintain integrity.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Previously not possible to replace due to the exotic metals in the system. Applied as needed to keep the residual nitrite levels in the system within specification.

1. Biodegradation <20%

2. Biodegradation <20%

3. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

<u>EC2217A</u>	
Product Informa	

Product Information		
Registered Chemical Name	EC2217A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Demulsifier	
Use	Used during production operations as a demulsifier to remove water from the produced fluids and improve the efficiency of the separation of oil and water.	
Discharge phased out	N/A (renamed)	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Application of demulsifier provides an operational buffer that facilitates the maintenance of the oil in water (OIW) concentration below the legal limit while accommodating changing process conditions and upsets.	
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other 	
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Substitution free demulsifiers, Emulsotron CC 3344-G and EMBR13442C have been trialled on one installation following favourable results during offshore bottle tests. Field trial showed neither performed better than the incumbent due to issues with oily sand in the separator. The vessels are to be cleaned in 2020 and a further trial will be undertaken. Alternativeproducts, EMBR17852B, EMBR17904B and EMBR13434A, are to be trialled on one installation in 2020. Initial trial has identified a suitable replacement product and a further extended trial is planned for 2021. Other: Proven with regards to the challening oil/water separation and water quality issues on the asset and will be used until a suitable alternative product is found. 	

Product Information		
Registered Chemical	EC6191A	
Name		
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Coagulant	
Use	Used during production operations as a deoiler to improve the clarity of produced water.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Product acts as a reverse emulsion breaker in this application and required to maintain oil in water (OIW) levels within regulatory limits.	
Reason(s) for non- replacement	1. No suitable alternative. 8. Other.	
Evidence in support of continued discharge	 Other: Operator has changed chemical supplier, the potential replacement product, versalis e[®]-embr E200 R, also has a substitution warning. Potential replacement product, EC6029A, was unsuccessfully trialled in 2015. In 2017, bottle testing of substitution free product, CLAR17873A, was followed by an unsuccessful phase 1 field trial. A second field trial during 2018 using an alternative injection point showed OIW levels were reduced to that similar of the incumbent but this required a higher dosage rate. 	

EC61914	<u>\</u>
Product	Informati

EMBR12134A		
Product	Informatio	

FIGURE	
Registered Chemical Name	EMBR12134A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during production operations as a demulsifier to improve separation in the process system. Ensures the crude is dehydrated sufficiently to meet export crude water content specifications. Also used to clean water prior to overboard discharge.
Discharge phased out	 N/A One operator has replaced with EMBR13442C.
Replacement chemicals	EMBR13442C
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in maintaining contractual Basic Sediment and Water (BS&W) specification for export crude and minimising the potential for a corrosion failure in the export pipeline. Reduction of water volumes routed to export oil line also reduces power consumption and emissions generated by unnecessarily pumping water.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: One supplier is working to develop a substitution free alternative product. Offshore testing to identify a suitable substitution free alternative product is planned for September 2021. One operator has identified a replacement product, which will be introduced when chemical contract tendering is complete.

1. Biodegradation <20%
2. Biodegradation <20%
3. Biodegradation <20%

EMBR13426A		
Product	Informatio	

roduct information		
Registered Chemical Name	EMBR13426A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Demulsifier	
Use	Used in production operations as a demulsifier to break the emulsion formed between crude oil and produced water due to shearing of the fluids and the presence of natural surfactants.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Required to maintain oil in water (OIW) levels to within the defined limit for discharge. Also required to prevent process flow stability and level control problems in the process vessels.	
Reason(s) for non- replacement	 Awaiting trial (installation/supplier) Other 	
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Offshore bottle testing by the supplier in December 2020 identified two alternative substitution free products, EMBR13443A and EMBR13310A. Trial of one alternative product is planned for, after the shut down in May 2021. Bottle testing was conducted in 2019 which identified a substitution free replacement product, however, this has subsequently been given a substitution warning. 	

EMBR19508A	

Product Information	
Registered Chemical Name	EMBR19508A
Supplier	Nalco Champion (Nalco Ltd)
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during production operations as a demulsifier to improve and control the oil in water (OIW) of the crude oil.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	High viscosity of the crude oil coupled with low resevoir temperatures has the potential to cause topside phase seperation issues.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Installation has screened a number of demulsifiers to date, with the incumbent being the best performing product. Only one of the six shortlisted products does not contain the substance that results in a substitution warning. This alternative product has not been field-trialled due to incompatibility with the subsea structures.

1. Biodegradation <Pass rate and Toxicity <10ppm

EMBR22179A duct Info

Product Information	
Registered Chemical Name	EMBR22179A
Supplier	Nalco Champion (Nalco Ltd)
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during production operations as a demulsifier to aid the separation of oil from water.
Discharge phased out	N/A
Replacement chemicals	 Phasetreat 6094 Scheduled to be replaced with substitution free product, Phasetreat 6094, in 2021.
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Application provides an operational buffer that facilitates the maintenance of the oil in water (OIW) concentration below the legal limit while accommodating changing process conditions and upsets.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Trial of substitution free alternative product, Phasetreat 6094, was successful. Existing stocks of incumbent are to be run down before replacement, scheduled for 2021.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Log Pow >3

EMBR23344A

Product Information	
Registered Chemical Name	EMBR23344A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during drilling operations as a demulsifier to assist with the separation of oil from water.
Discharge phased out	 N/A One operator has removed from permit
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Improves the operational efficiency of the well separator and reduces the oil in water content, thus aiding water filtration prior to discharge.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: One operator has identified that potential alternative products are available with the supplier. Due to low usage of incumbent, trials are low priority. One operator is evaluating the suitability of available substitution free alternative products for this application.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

FlexSTONE HT NS B2002 Product Information

Registered Chemical Name	FlexSTONE HT NS B2002
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling operations as a cement additive for long term zonal isolation. Designed to be flexible and expand upon setting to prevent the formation of micro- annuli and stress related cracking. Also designed to fit changes in downhole conditions.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	The FlexSTONE system has tailored mechanical properties that can adapt to changes that will not fail under stress cycles and will maintain cement integrity and optimum zonal isolation. Reduces the potential for cement failure that can result in loss of hydrocarbons and well integrity requiring increased use of chemicals.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Alternative substances are being reviewed due to a technically specific substance, replacement is difficult. Used by one operator in very few operations and is low priority for replacement.

Reason why substance(s) are identified as a candidate for substitution

 Biodegradation <pass and="" log="" pow="" rate="">3</pass>
2. Biodegradation <20%

FLOCTREAT 7856

Product Information	
Registered Chemical Name	FLOCTREAT 7856
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Other
Use	Used during production operations to improve the efficiency of high flow rate water filtration units and maintain pressure in the seawater injection system.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	The performance of seawater injection drops dramatically without use during algal blooms. This could result in shutting in the water injection facilities which could have a detrimental effect in the future oil production potential (due to pressure support) of the fields.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Trial of a substitution free replacement product, FLOCTREAT 13264, was unsuccessful and the operator continues to search for alternative products.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

FLOTREAT DF 3159

Product Information	
Registered Chemical Name	FLOTREAT DF 3159
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Wax Inhibitor
Use	Used in production operations as a wax inhibitor to prevent wax depositing from crude oils in well tubing, production flowlines and transport pipelines.
Discharge phased out	Product not discharged.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Will be contained within the export crude oil, or flared off with gas and is not normally discharged.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Applied on an ad hoc basis if operationally necessary and it would not be discharged. Specifically designed to prevent the growth of interlocking wax crystals in crude oils that contains above normal quantities of wax and will also function as a pour point depressant.

Reason why substance(s) are identified as a candidate for substitution

Fluorescein Liquid Dye, 40% Product Information

Product Information	
Registered Chemical Name	Fluorescein Liquid Dye, 40%
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Pipeline Hydrotest Chemical
Use	Used in pipeline operations as a pipeline hydrotest chemical added to vessels and pipelines as a visual aid during leak testing/hydrotesting.
Discharge phased out	Νο
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Easily visible to the naked eye reducing the need for further detection equipment or chemical testing.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Product is pre-filled in tie-in spools and at present there is no replacement schedule available.

Reason why substance(s) are identified as a candidate for substitution

Registered Chemical Name	Fluorodye UC
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Pipeline Hydrotest Chemical
Use	Used during production, drilling and well intervention operations as a pipeline hydrotest chemical added to vessels and pipelines as a visual aid during a variety of operations including leak testing/hydrotesting and cementing.
Discharge phased out	 N/A 3 operators have replaced with Hydrosure Red Dye Liquid. One operator has no plans to use in 2021.
Replacement chemicals	C-Dye and Hydrosure Red Dye Liquid
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Easily visible to the naked eye reducing the need for further detection equipment or chemical testing.
Reason(s) for non- replacement	4. Trial ongoing 8. Other

1. Biodegradation <Pass rate and Toxicity <10ppm

FOAM17007A Product Inform

Product Information	
Registered Chemical Name	FOAM17007A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Other
Use	Used during production operations downhole as a foamer to help remove excess liquid from gas and gas/condensate wells.
Discharge phased out	Νο
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Removes excess liquid from liquid loaded gas and gas/condensate wells allowing for a more efficent restart.
Reason(s) for non- replacement	 Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Best in class foamer tests have identified an alternative product, MI GT-7929, with technical performance that is equals the incumbent. Awaiting approval to implement trial in 2021. An alternative product has been identified for use on one installation and will be field trialled if laboratory testing is successful. Other: Superior in performance to several substitution free alternative products.

Reason why substance(s) are identified as a candidate for substitution

FOAM20502A

Product Information	
Registered Chemical Name	FOAM20502A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Silver
Function/Application	Other
Use	Used in well and production operations to reduce liquid loading and assist the wells to flow.
Discharge phased out	 N/A Will not be used during 2021 on one platform due to start of decommissioning. One operator will phase out during 2021 and replace with substitution free product, FOAM25005A. One operator will discontinue use in open systems.
Replacement chemicals	 FOAM25005A Replacement product, FOAM25005A, has successfully undergone compatibility testing and will replace the incumbent on one operator's installations during 2021.
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Designed to lift the column of fluids within the well by changing fluids in the wellbore into foam making it easier for the gas from the reservoir to lift, thus increasing oil production.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: One operator has reviewed alternative products on set requirements from several suppliers. Two products passed initial screening, neither met all key performance indicators. However, the intention is to field trial these two alternative products. Long term development of alternative products will continue. Product will continue to be in used in closed systems and use in open systems (e.g. discharge) will be discontinued.

Reason why substance(s) are identified as a candidate for substitution

FOAM20505A

Product Information	
Registered Chemical	FOAM20505A
Name	
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Silver
Function/Application	Other
Use	Used during production operations downhole as a foamer to help remove excess liquid from gas and gas/condensate wells.
Discharge phased out	Νο
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Designed to lift the column of fluids within the well by changing the fluids in the wellbore into foam making it easier for the gas from the reservoir to lift, thus increasing oil production.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	Other: No suitable alternative identified.

Reason why substance(s) are identified as a candidate for substitution

FOAMTREAT 904 Product Information

Registered Chemical Name	FOAMTREAT 904
Supplier	Clariant Oil Services UK Ltd
Registered Category	Silver
Function/Application	Antifoam (Hydrocarbons)
Use	 Used during production operations as an antifoam suited for foam suppression during gas processes.
Discharge phased out	Νο
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for	Used in response to upsets in the amine plan due to the system design. Therefore
continued use and discharge	identifying a suitable replacement is difficult.
continued use and discharge Reason(s) for non- replacement	 identifying a suitable replacement is difficult. 1. No suitable alternative 2. Compatibility issues with alternative 8. Other

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <20%	
2. Biodegradation <20%	
3. Log Pow >3 and Toxicity <10ppm	

FORM-A-BLOK™

Product Information	
Registered Chemical Name	FORM-A-BLOK™
Supplier	M-I Drilling Fluids UK Limited
Registered Category	Gold
Function/Application	Lost Circulation Material
Use	Used during drilling and well intervention operations as a lost circulation additive for wellbore strengthening and a variety of lost circulation scenarios.
Discharge phased out	 N/A One operator has no plans for use in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Recommended for treatment of lost circulation problems associated with drilling through depleted, low-fracture gradient sands where higher mud weights are required to minimize compressive failure in adjacent shales. Suitable for use in high pressure, high temperature (HPHT) wells.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Investigation of an alternative product is on-going. Supplier will continue to work with operators on replacement plans and suitable alternative products.

Reason why substance(s) are identified as a candidate for substitution

 Biodegradation <20% 	
2. Biodegradation <20%	

FYREWASH F3 (O&G)

Product Information	
Registered Chemical Name	FYREWASH F3 (O&G)
Supplier	ROCHEM TECHNICAL SVS (EUROPE) LTD
Registered Category	White
Function/Application	Detergent/Cleaning Fluid
Use	Used in production operations as detergent to clean turbines and maintain turbine efficiency.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Applied periodically at the turbine intakes, the majority will be burnt off during online washes. Any residual chemical will enter the closed drains and will reenter the process prior to discharge.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Alternative products are being investigated as exisiting stocks are used

Reason why substance(s) are identified as a candidate for substitution

GASBLOK* D700 High-Temperature Additive

FIGURE	
Registered Chemical Name	GASBLOK* D700 High-Temperature Additive
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive designed to provide gas migration control in cement slurries at high temperature.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	If the cement slurry is permeable, gas can migrate to the surface with consequent safety risks to personnel and equipment.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: Current alternative methodologies have been shown not to work in a high severity gas migration environment.

Reason why substance(s) are identified as a candidate for substitution

GASBLOK* D701 Stabilizer

Product Information	
Registered Chemical	GASBLOK* D701 Stabilizer
Name	
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive. Designed as a stabilizer in conjunction with GASBLOK* D700 High-Temperature Additive to provide better fluid-loss control and setting properties when gas zones are encountered.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	If the cement slurry is permeable, gas can migrate to the surface with consequent safety risks to personnel and equipment.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Current alternative methodologies have been shown not to work in a high severity gas migration environment.

Reason why substance(s) are identified as a candidate for substitution

GASBLOK* LT D500

Product Information	
Registered Chemical Name	GASBLOK* LT D500
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive to provide gas migration control in cement slurries at low temperatures.
Discharge phased out	No
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Part of a speciality cement design that is required for its technical performance to prevent gas migration. If gas can migrate to the surface there are increased safety risks to personnel and equipment.
Reason(s) for non- replacement	1. No suitable alternative
Evidence in support of continued discharge	 No suitable alternative: No potential replacement product has been identified with the same technical functionality as the incumbent.

Reason why substance(s) are identified as a candidate for substitution

GASSTOP LIQUID

Registered Chemical Name	GASSTOP LIQUID
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive to provide fluid loss control and to prevent gas migration into cement during setting.
Discharge phased out	 N/A One operator will use new supplier product in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used for safety critical applications such as gas migration control, cementing across salt formations or high pressure, high temperature (HPHT) and must be applied. Setting times are decreased preventing annular gas flow and removes the requirement for remedial cementing operations to cure this potentially dangerous phenomena.
Justification for continued use and discharge Reason(s) for non- replacement	Used for safety critical applications such as gas migration control, cementing across salt formations or high pressure, high temperature (HPHT) and must be applied. Setting times are decreased preventing annular gas flow and removes the requirement for remedial cementing operations to cure this potentially dangerous phenomena. 1. No suitable alternative 8. Other

Reason why substance(s) are identified as a candidate for substitution

<u>Glycolube Gel</u> Product Informat

Product Information	
Registered Chemical Name	Glycolube Gel
Supplier	SANCCUS LIMITED
Registered Category	Gold
Function/Application	Pipeline Pigging Chemical
Use	Used during pipeline operations as a gel pig for pipeline pigging.
Discharge phased out	Νο
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	The substance which is subject to the substitution warning is widely used in this application. At present there are no suitable substances that reduce friction more effectively and at a lower addition rate than the incumbent.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Not a substitution product at time of use and has recently gained a substitution warning. Supplier has identified a substitution free alternative for one substance within the product and expects to replace this substance and recertify the product in 2021. Supplier will continue to work on alternative substances to find a candidate that is comparable in terms of efficacy.

Reason why substance(s) are identified as a candidate for substitution

Greenbase ™ Flowzan [®] Biopolymer

Product Information	
Registered Chemical Name	Greenbase [™] Flowzan [®] Biopolymer
Supplier	Drilling Specialties Company LLC
Registered Category	Silver
Function/Application	Viscosifier
Use	Used during production, drilling and well intervention operations as a viscosifier in drilling muds, completion fluids or cement slurries for rheology modification, improved hole cleaning and solids suspension. Also used in combination with a scale dissolver to ensure correct placement of treatments.
Discharge phased out	N/AOne operator has no plans for use in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Provides excellent friction reduction for coil tubing operations. When used in drilling, will significantly enhance product dispersion and solubility, and reduce the formation of fisheyes.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Suspension system with a different base oil and suspension agents is under development, if this performs well with another ingredient the supplier will apply to the incumbent. Product provides extremely low-solids fluids with excellent carrying and suspending characteristics, due to their "shear-thinning" properties when compared to other products used in oilfield drilling and completion applications. Chosen when rapid dispersion or minimal mixing is required.

Reason why substance(s) are identified as a candidate for substitution

HALAD 600LE+
Product Information

Registered Chamical	
Name	HALAD 600LE+
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive for fluid loss control preventing premature dehydration of the cement slurry when placed across permeable formations. Also acts as a mild anti-gas migration additive to prevent annular gas flow as the cement goes through its transition phase.
Discharge phased out	 N/A One operator has changed supplier and will use new supplier products in 2021.
Replacement chemicals	HALAD-300L NSNot suitable in all applications
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Less retarding than conventional substances at lower temperature. This has the technical benefits of providing fluid loss and anti-gas migration properties whilst also providing the required dispersing effect. Can be used over a much wider temperature range than conventional substances and requires less volume of chemical to give the same fluid loss control properties.
Reason(s) for non- replacement	 Compatibility issues with alternative Other
Evidence in support of continued discharge	 Compatibility issues with alternative: Replacement product, HALAD-300L NS, has a secondary effect of increased slurry rheology this is undesirable in high pressure, high temperature (HPHT) heavyweight slurry designs.
	 Other: Test projects are underway to evaluate alternative products. No direct replacement is available.

High Perm CRB Product Information

Registered Chemical Name	High Perm CRB
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Well Stimulation Chemical
Use	Used in drilling and production operations as a well stimulation chemical to increase production by improving hydrocarbon flow from the reservoir into the well bore.
Discharge phased out	 N/A Operator plans to remove from chemical permit as product is no longer required.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential part of the fracturing process preventing damage to the formation facilitating the continued flow of hydrocarbons.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Alternative systems and additives are being evaluated by the supplier. Used in small amounts.

Reason why substance(s) are identified as a candidate for substitution

HIW82	2254

Product Information	
Registered Chemical Name	HIW82254
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Gas Hydrate Inhibitor
Use	Used in production operations as a kinetic hydrate inhibitor (KHI) designed to supress the formation of hydrate thus maintaining flow assurance.
Discharge phased out	N/A
Replacement chemicals	 Methanol One operator plans to use methanol when flushing operations are complete.
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Was selected as best in class from a range of potential KHIs. Provides effective and longest lasting hydrate inhibition, therefore preventing blockages and maintaining flow in subsea pipelines.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Will be retained on permit until flushing operations are complete. Offshore bottle tests took place in 2020 to monitor the impact of a substitution free inhibitor. Work is ongoing to qualify a low dosage substitution free Anti-Agglomerant (AA) for use in the field. Which has perforance advantages over KHIs in terms of hydrate protection and compatibility with corrosion inhibitors. If successful this would allow for the selection of a new, potentially substitution free corrosion inhibitor.

<u>HPT-1</u>	
Product	Information

Registered Chemical Name	HPT-1
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Well Stimulation Chemical
Use	Used in well intervention operations as a well stimulation chemical which reduces water effective permeability in the reservoir, enhancing hydrocarbon flow to the wellbore.
Discharge phased out	N/AOperator has no plans to use in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Improved oil/gas recovery potential from a reduced water column giving natural lift for the residual oil and/or gas. In addition, the incumbent helps prolong and sustain production by enhancing reservoir drainage.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Only product registered that can reduce water effective permeability in the reservoir within the specified range.

1. Biodegradation <20%	
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass> 	

Product Information			
Registered Chemical Name	HSCV10610A		
Supplier	ChampionX (Champion Technologies Ltd)		
Registered Category	Gold		
Function/Application	Hydrogen Sulphide Scavenger		
Use	Used during production operations as a scavenger to control corrosion and prevent release of toxic gas.		
Discharge phased out	N/A		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Yes		
Justification for continued use and discharge	Required to maintain integrity of export pipelines and the release of toxic gas.		
Reason(s) for non- replacement	 No suitable alternative Other 		
Evidence in support of continued discharge	 Other: A substitution free alternative product has been developed, however it is not commercially available. Trialled in 2018 as a replacement product for Gastreat K160.Trial successfully showed a reduction in product use. The incumbent will continue to be used until a suitable alternative product can be evaluated for use. Research and development is on-going. A suitable alternative product has been formulated and is awaiting for its performance to be confirmed prior to registeration. 		
Hy	dre	x 45	514
----	-----	------	-----
_			

Product Information	
Registered Chemical Name	Hydrex 4514
Supplier	VEOLIA SOLUTIONS & TECHNOLOGIES SUPPORT
Registered Category	Gold
Function/Application	Detergent/Cleaning Fluid
Use	Used in production operations to remove scale and organic fouling from ultra-filtration filters. Maintains filter performance ensuring all lifted seawater is suitably prepared for use in the water injection system
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Failure to maintain filter performance would lead to water injection down time and production shutdowns due to reliance on seawater lift.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: A substitution free replacement product, RoClean L211F, has been identified from another supplier. This has been added to the permit and a field trial is planned for 2021.

Hydrosure Bioscav Bags Product Information

roduct information		
Registered Chemical Name	Hydrosure Bioscav Bags	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used during drilling, pipeline and well intervention operations as a corrosion inhibitor provide long term protection in open and closed systems.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Critical for protecting the integrity of subsea infrastructure preventing failure of safety critical assets and consequent unplanned releases to the marine environment.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Unique product used for specific applications. It has not been possible to identify an alternative product that provides the same level of performance and stability. 	

Reason why substance(s) are identified as a candidate for substitution

1. Log Pow >3 and Toxicity <10ppm

Hydrosure Fluorodye UC Stick Product Information

roduct information		
Registered Chemical Name	Hydrosure Fluorodye UC Stick	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Pipeline Hydrotest Chemical	
Use	Used during pipeline operations as a pipeline hydrotest chemical added to vessels and pipelines as a visual aid during leak testing and hydrotesting operations.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Easily visible to the naked eye reducing the need for further detection equipment or chemical testing.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: Product is dosed at lower rates than typical industry dyes making the stick more efficient than other products currently available. 	

Reason why substance(s) are identified as a candidate for substitution

Hydrosure[™] Corrosion Inhib. Stick

Product Information	
Registered Chemical Name	Hydrosure™ Corrosion Inhib. Stick
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during pipeline operations as a corrosion inhibitor designed to protect and preserve the integrity of connections, spools, pipework and other subsea structures.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Protects and preserves the integrity of connections, spools, pipework and other subsea structures.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: Alternative products also have substitution warnings.

Reason why substance(s) are identified as a candidate for substitution

IDCAP D	
Product	Inform

Product Information	
Registered Chemical	IDCAP D
Supplier	M-I Drilling Fluids LIK Limited
Registered Category	
Function/Application	Shale Inhibitor / Encapsulator
Use	Used during drilling and well intervention operations as a shale inhibitor / encapsulator to provide cuttings encapsulation and clay dispersion inhibition. Enables minimal viscosity and enhances filtration properties.
Discharge phased out	N/A
Replacement chemicals	 EMI 3172 and ULTRACAP Alternative products, EMI 3172 and ULTRACAP can be used with reduced performance.
Trials Undertaken	No
(Yes or No)	
(Yes or No) Justification for continued use and discharge	Currently the best available in class, its superior performance reduces discharge to the marine environment as less dilution of fluids is required.
(Yes or No) Justification for continued use and discharge Reason(s) for non- replacement	Currently the best available in class, its superior performance reduces discharge to the marine environment as less dilution of fluids is required. 1. No suitable alternative 2. Compatibility issues with alternative 8. Other
(Yes or No) Justification for continued use and discharge Reason(s) for non- replacement Evidence in support of continued discharge	 Currently the best available in class, its superior performance reduces discharge to the marine environment as less dilution of fluids is required. 1. No suitable alternative 2. Compatibility issues with alternative 8. Other Compatibility issues with alternative: Alternative products, EMI 3172 and ULTRACAP, can be used with reduced performance, the incumbent is still required.

LATEX 4000				
Droduct	Informatio			

FIGURE	
Registered Chemical Name	LATEX 4000
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Fluid Loss Control Chemical
Use	Used in well intervention operations as a fluid loss control chemical to greatly reduce fluid loss.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Cements treated with the incumbent exhibit excellent wetting properties, low viscosities and increased resiliency. These properties increase bonding resulting in a tighter annular seal and superior zonal isolation.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued	 Other: Currently there are no known technologies that produce the same unique

Liquidev	<u>vt</u>
Product	Informa

Product Information	
Registered Chemical Name	Liquidewt
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	В
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor used within the cooling medium systems to maintain nitrite and pH levels and prevent corrosion.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Compatible with the metallurgy of the system as advised by the manufacturer. Must be applied to protect the integrity of the systems.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Installation is due to enter Cessation of Production (CoP) in 2021 and the existing stock of incumbent is sufficient to last until that time.

 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass> 	
2. Biodegradation <20%	

MCS-J	
Droduct	Informat

Product Information	
Registered Chemical Name	MCS-J
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during production, drilling and well intervention operations as a cement spacer to clean the well bore and create a barrier between the mud systems and cement.
Discharge phased out	N/A
Replacement chemicals	 MCS-NS Two operators plan to replace incumbent with alternative product, MCS-NS, in 2021.
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Critical to the success of the cement job, as the condition of the casing and formation prior to cementing can dramatically affect the quality of the cement bond.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Product will continue to be used until an alternative product has been identified that meets all requirements.

1. Biodegradation <Pass rate and Log Pow >3

Medium Temp ERT - Modifier Pack

Product Information	
Registered Chemical Name	Medium Temp ERT - Modifier Pack
Supplier	Neo Products, LLC
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during well intervention operations as part of a specialist cement system, deployed downhole by wireline bailer assemblies to the required depth to prevent early gelling.
Discharge phased out	 N/A Not discharged to the environment by one operator.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Ability to withstand high temperatures and prevents the migration of hydrocarbons to the surface. Increases life expectancy of the bridge plug and can also be used to set a water shut-off plug.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Research work is being undertaken using alternative chemistries currently no suitable alternative product has been identified. Currently most efficient product for withstanding high temperatures.

Reason why substance(s) are identified as a candidate for substitution

MUDPUSH WHT Spacer D190

Product Information	
Registered Chemical Name	MUDPUSH WHT Spacer D190
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Fluid Loss Control Chemical
Use	Used in drilling operations as a fluid loss control chemical for water based mud removal in high temperature applications.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Specially developed for use in high temperature applications for the removal of water based mud.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Research is on-going and currently no suitable alternative products have been identified. Alternative product, MUDPUSH WHT Spacer D219, also has a substitution warning. Use is limited to high temperature environments where more environmetally alternative products are not available.

Reason why substance(s) are identified as a candidate for substitution

MULTITREAT 12726 Product Information

Product information	
Registered Chemical Name	MULTITREAT 12726
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used in production operations as a corrosion inhibitor to inhibit a specific type of scale.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Bespoke product for controlling a specific type of scale and corrosion to maintain the integrity of the process system.
Reason(s) for non-	1. No suitable alternative
replacement	8. Other
Evidence in support of continued discharge	 Other: Is a replacement product for MULTITREAT 584 which has environmental concerns. Improves hydrocyclone efficiency resulting in improved quality of the oil in water discharges. A bespoke product that is difficult to replace effectively in a way that significantly reduces any environmental impact.

Reason why substance(s) are identified as a candidate for substitution

MULTITREAT 16740

Reason why substance(s) are identified as a candidate for substitution

Log Pow >3 and Toxicity <10ppm
 Biodegradation <Pass rate and Log Pow >3

NALFLEET ENGINE WATER TREATMENT 9-108

Product Information	
Registered Chemical Name	NALFLEET ENGINE WATER TREATMENT 9-108
Supplier	Wilhelmsen Chemicals AS
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production operations as corrosion inhibitor in heating and cooling systems to maintain integrity.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Applied as needed to keep the residual nitrite levels in the system within specification and maintain integrity.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: No longer registered and remains on permit while existing stocks are consumed. Use and discharge are limited.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <20%

2. Biodegradation <Pass rate and Log Pow >3

NAPH22001A

Product Information	
Registered Chemical Name	NAPH22001A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Silver
Function/Application	Other
Use	Used during production operations as a calcium naphthenate (CAN) inhibitor to reduce the risk of CAN deposition in the process stream.
Discharge phased out	 N/A Not used and no longer required by one operator and will be removed from permit 2021 onwards. PHASETREAT 6173 will be used instead.
Replacement chemicals	PHASETREAT 6173
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	CAN deposits build up in vessels and pump strainers resulting in production shut-downs and process upsets.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Specifically formulated and optimised for the asset resulting in the reduction of discharge. Has the potential to reduce oil in water (OIW), removing the requirement for the use of two products.

Reason why substance(s) are identified as a candidate for substitution

1. Log Pow >3 and Toxicity <10ppm

Oceanic HW 443

Product Information	
Registered Chemical Name	Oceanic HW 443
Supplier	MacDermid Offshore Solutions
Registered Category	D
Function/Application	Hydraulic Fluid
Use	Used during production, pipeline, drilling and well intervention operations as a safety critical hydraulic fluid.
Discharge phased out	 N/A One operator has replaced with substitution free Oceanic HW443 R.
Replacement chemicals	Oceanic HW443 R
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Hydraulic fluic used in safety critical open and closed loopsystems.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Replacement is difficult due to safety and technical requirements which cannot be compromised. Specified for use by equipment manufacturers, has proven excellent technical performance and reliability in safety critical applications.

Reason why substance(s) are identified as a candidate for substitution

OCEANIC HW 540 v3

Product Information	
Registered Chemical Name	OCEANIC HW 540 v3
Supplier	MacDermid Offshore Solutions
Registered Category	A
Function/Application	Hydraulic Fluid
Use	Used in production operations as a high-performance hydraulic fluid for the operation of sub-sea valves on the main oil and gas import and export system.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Provides a high degree of protection against wear, corrosion and microbiological degradation in safety critical open and closed loop subsea control systems.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Oceanic HW540 v3 is the new name for Oceanic HW540 v2. Changing out of the hydraulic fluid carries a unknown risk in a safety critical system, which is considered unacceptable. Research and development to improve the environmental profile of products, OCEANIC HW 540 and OCEANIC HW 540 v3, without compromising operational safety was successful. Trials of direct replacements, Oceanic HW443 and Oceanic HW700 series fluids and alternative substitution free product, OCEANIC HW 540E have not been conducted due to Covid-19 restriction. The predicted timescale for replacement is 1 year. Replacement is difficult due to safety and technical requirements which cannot be compromised.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

Product Information	
Registered Chemical Name	OSCV20016A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	A
Function/Application	Oxygen Scavenger
Use	Used during production operations as an oxygen scavenger, improving corrosion protection of topsides and downhole pipework.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Critical application to reduce the oxygen content of the lifted seawater to prevent corrosion in the production system.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Green version of product, OSCV10515A, is hazardous to personnel. Two alternative products have been identified. One is uneconomical and the other, is non viable due to the unachieveable large flow rates required to attain key performance indicators. This type of chemistry will always have a substitution warning.

1. Inorganic with tox <1ppm

PA082427

Product Information	
Registered Chemical Name	PAO82427
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Asphaltene Inhibitor
Use	Used in production operations as an asphaltene inhibitor.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used in specialist applications.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	Other:The chemical is likely to be exported with oil.

Reason why substance(s) are identified as a candidate for substitution

|--|

Product Information	
Registered Chemical Name	PAO82730
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Wax Inhibitor
Use	Used in production operations to inhibit wax deposition in the production condensate pipeline.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Inhibits wax deposits in pipelines therefore preventing blockages and maintaining production.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: Optimisation is ongoing to reduce the dosage of the incumbent for the required level of protection against wax deposition. Identified as the best wax inhibitor for the field after trials. Replaced substitution free alternative product, PAO85433, which did not provide the required level of wax protection.

1. Biodegradation <Pass rate and Log Pow >3

PARA12193B	
Product Information	

Product Information	
Registered Chemical Name	PARA12193B
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Wax Inhibitor
Use	Used in production operations for a wax inhibitor trial. PARA12193B, was considered as a replacement for product, PI-78017 which minimises the effects of paraffin deposition in oil production wells, flowlines, pipelines and the process systems.
Discharge phased out	 N/A Unsuitable as a replacement for PI-78017 and will not be used in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	N/A
Reason(s) for non- replacement	N/A
Evidence in support of continued discharge	N/A

Product Information	
Registered Chemical Name	PHASETREAT 14371
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Demulsifier
Use	Used in production operations as a demulsifier to aid oil and water separation and counteracting the effect of wax inhibitor returned to the topside process.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Used when there is a high degree of surface-active emulsifying compounds present in the treated fluids. Highly effective at emulsion breaking in oil and gas processing systems resulting in efficient dehydration of crude oil and cleaner produced water.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Bottle testing for the selection of demulsifiers and deoilers performed in 2020, possible alternative products showed equal or reduced performance. Bottle tests of Phasetreat 14371 for use in the field could not be completed as representative demulsifier free samples could not be taken for tests. Manufacturer is working to replace current formulations with substitution free alternative products.

Reason why substance(s) are identified as a candidate for substitution

Product Information	
Registered Chemical Name	PHASETREAT 6173
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Demulsifier
Use	Used during production operations as a demulsifier designed to provide rapid oil/water separation. Also minimises the formation of Calcium Naphthenate (CAN) deposits.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential to prevent blockages in the production systems within a period of 12 hours caused by potential formation of CAN deposits.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Trials of potential alternative product, PT12138, were not progressed due to cost and environmental concerns. Used in conjunction with SCAL11140A to inhibit CAN deposition and is therefore difficult to replace. The chemistry of this application has proven to be the best option for controlling CAN deposits.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

Product Information	
Registered Chemical	PHASETREAT 6252
Name	
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Demulsifier
Use	Used in production operations as a demulsifier, required to achieve good oil in water (OIW) and water in oil (WIO) export specifications.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Facilitates the maintenance of the OIW concentration below the legal limit while accommodating changing process conditions and upsets.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Bottle tests in 2020 continued to identify the incumbent as the most effective available. Currently not fully in use due to low water volumes. Operator plans to use bottle testing on 'live' fluids to evaluate possible alternative products when in use.

Reason why substance(s) are identified as a candidate for substitution

Product Information	
Registered Chemical Name	PHASETREAT 6285
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Demulsifier
Use	Used in production operations as a demulsifier applied to aid the separation of oil and water.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Facilitates the maintenance of the OIW concentration below the legal limit while accommodating changing process conditions and upsets. In severe cases, plant trips and shut downs can occur.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: Offshore laboratory tests with substitution free alternative products are planned. Formulation is the result of extensive screening on various types of crude oil emulsions. Selected for use when substitution free and has proven to be effective.

Reason why substance(s) are identified as a candidate for substitution

Product Information	
Registered Chemical Name	PHASETREAT 6398
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Demulsifier
Use	Used in production operations as a demulsifier applied to aid the separation of oil and water.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Facilitates the maintenance of the OIW concentration below the legal limit while accommodating changing process conditions and upsets. In severe cases, plant trips and shut downs can occur.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Offshore laboratory tests with substitution free alternative products is planned. Formulation is the result of extensive screening on various types of crude oil emulsions. Selected for use when substitution free and has proven to be effective.

Reason why substance(s) are identified as a candidate for substitution

<u>PI-7050</u>	
Product	Inforr

Product Information	
Registered Chemical Name	PI-7050
Supplier	Schlumberger Production Technologies
Registered Category	Silver
Function/Application	Wax Dissolver
Use	Used during well intervention operations as a wax dissolver for the rapid dissolution of wax deposits.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Developed during a best in class exercise, formulated for use in specific fields. Proven to effectively remove asphaltene depositions from pipelines.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	Other:Used as a contingency product.

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

Registered Chemical Name	PI-78017
Supplier	Schlumberger Production Technologies
Registered Category	Gold
Function/Application	Wax Inhibitor
Use	Used in drilling and production operations as a wax inhibitor which minimises the effects of wax deposition in oil production wells, flowlines, pipelines and the process systems.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Inhibits the condensate from gelling, maintaining flow at lower temperatures.
Reason(s) for non- replacement	1. No suitable alternative
Evidence in support of continued discharge	 No suitable alternative: No potential replacement product has been identified with the same technical functionality as the incumbent.

Registered Chemical	Proxel XL2
Name	
Supplier	LONZA
Registered Category	Gold
Function/Application	Biocide
Use	Used in production and drilling operations as a biocide in cooling media and completion fluids to prevent bacterial growth.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Maintains cooling systems integrity by controlling bacterial population which can effect corrosion inhibition.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Used as a contingency biocide by two operators. Use of existing stocks as no longer manufactured. Selected for use when substitution free then gained a substitution warning in February 2020. Supplier is currently collating data to support the removal of the substitution warning.

<u>RBW80103</u>

Product Information	
Registered Chemical	RBW80103
Name	
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to assist with oil removal.
Discharge phased	N/A
out	
Replacement	N/A
chemicals	
Trials Undertaken	No
(Yes or No)	
Justification for	Required to ensure that oil in water (OIW) concentration in the produced water is
continued use and	within legislative limits for discharge.
discharge	
Reason(s) for non-	1. No suitable alternative
replacement	8. Other
Evidence in support	Other;
of continued	 Identified as best performing single treatment water clarifier during offshore
discharge	tests in 2019.
	 Operator is planning to undertake bottle testing of alternative substitution
	free water clarifiers in 2021.

Reason why substance(s) are identified as a candidate for substitution

<u>RBW80122</u>

Product Information	
Registered Chemical	RBW80122
Name	
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to assist with oil removal.
Discharge phased out	 N/A No longer required by one operator due to unsuccessful trial and has been removed from the 2021 permit.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Required to ensure that oil in water (OIW) concentration in the produced water is within legislative limits for discharge.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Contingency product to be used if elevated OIW levels are observed on start- up of the produced water treatment system.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <20%
Log Pow >3 and Toxicity <10ppm
3. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>

.

<u>RBW80243</u>

Product Information	
Registered Chemical Name	RBW80243
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to assist with oil removal.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Required to ensure that oil in water (OIW) concentration in the produced water is within legislative limits for discharge.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Possible alternative product with increased performance was identified during field bottle testing in 2019. Results showed that its usage is expected to be less than the incumbent. The alternative product is currently undergoing commercialisation and may be awarded a substitution warning.

Reason why substance(s) are identified as a candidate for substitution

<u>RBW85108</u>

Product Information	
Registered Chemical Name	RBW85108
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to assist with oil removal.
Discharge phased out	 N/A One operator will replace with RBW88077 on one installation.
Replacement chemicals	RBW88077
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Required to ensure that oil in water (OIW) concentration in the produced water is within legislative limits for discharge.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Trials of alternative product with a substitution warning, RBW88067, were successful. Supplier has reformulated RBW88067 to substitution free product, RBW88077.

Reason why substance(s) are identified as a candidate for substitution

<u>RBW85165</u>

Product Information	
Registered Chemical Name	RBW85165
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Water Clarifier
Use	Used during production operations as a water clarifier to assist with oil removal.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Required to ensure that oil in water (OIW) concentration in the produced water is within legislative limits for discharge. Also has a synergistic effect with other water clarifiers.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: A possible alternative product with increased performance was identified during field bottle testing in 2019. Results showed that its usage is expected to be less than the incumbent. The alternative product is currently undergoing commercialisation and may be awarded a substitution warning.

Reason why substance(s) are identified as a candidate for substitution

.

<u>RBW85178</u>

i louuce information	roduct Information		
Registered Chemical Name	RBW85178		
Supplier	Baker Hughes Limited		
Registered Category	Gold		
Function/Application	Water Clarifier		
Use	Used during production operations as a water clarifier to assist with oil removal.		
Discharge phased out	 N/A One operator has removed from the 2021 permit on one installation. 		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Yes		
Justification for continued use and discharge	Required to ensure that oil in water (OIW) concentration in the produced water is within legislative limits for discharge.		
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other 		
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Alternative products will be trialled for efficiency during a proposed 2021 field trials. Alternative products were screened offshore on live fluids in 2018 by the incumbent supplier, none matched or outperformed the incumbent. Live fluids will be tested again in 2021 to prepare for later life operations. Other: A field trial in February 2018 following bottle tests of an alternative product resulted in numerous issues. One operator indicates that conditions are not 		

Reason why substance(s) are identified as a candidate for substitution

.

<u>RBW85188</u>

Product Information	
Registered Chemical	RBW85188
Name	
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Water Clarifier
Use	.Used in production operations as a water clarifier added to the lifted seawater, to reduce the particulate content which minimises any potential for reservoir damage.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Industry standard for this type of application due to proven track record and excellent performance for successful water flood management.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: No trials due to lack of bedspace and Covid-19. First trialled in March 2018. Will remain on permit as a contingency product with a reduction in use and dosage rate.

Reason why substance(s) are identified as a candidate for substitution

<u>RBW85754</u>

Product Information		
Registered Chemical Name	RBW85754	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Water Clarifier	
Use	Used during production operations as a water clarifier to assist with oil removal.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Required to clean up produced water to ensure it meets legislative oil in water (OIW) discharges.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: One operator indicates that conditions are not suitable for field trials and will commence once the produced water is stable. 	

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <20%	
2. Log Pow >3 and Toxicity <10ppm	
<u>RBW88067</u>

Product Information	
Registered Chemical Name	RBW88067
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Water Clarifier
Use	Used in production operations as a trial water clarifier to assist with oil removal.
Discharge phased out	 N/A One operator used only during trials, no further use is planned.
Replacement chemicals	RBW88077
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Required to ensure that oil in water (OIW) concentration in the produced water is within legislative limits for discharge.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: Trials of alternative product with a substitution warning, RBW88067, were successful. Identified substitution free product, RBW88077. One operator indicates that conditions are not suitable for field trials and will commence once the produced water is stable.

Reason why substance(s) are identified as a candidate for substitution

 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>
 Biodegradation <pass <10ppm<="" and="" li="" rate="" toxicity=""> </pass>

RGTO-003	

Product Information	
Registered Chemical Name	RGTO-003
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during drilling operations as a chemical tracer. Inserted at pre-determined points along the producing zone within the wellbore to indicate if oil in-flow is present in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

RGTO-004	

Product Information	
Registered Chemical Name	RGTO-004
Supplier	Resman AS
Registered Category	Gold
Function/Application	Tracer Chemical
Use	Used during drilling operations as a chemical tracer. Inserted at pre-determined points along the producing zone within the wellbore to indicate if oil in-flow is present in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

1. Biodegradation <Pass rate and Log Pow >3;Toxicity <10ppm

RG	TO-0	05

Product Information	
Registered Chemical Name	RGTO-005
Supplier	Resman AS
Registered Category	Gold
Function/Application	Tracer Chemical
Use	Used during drilling operations as a chemical tracer. Inserted at pre-determined points along the producing zone within the wellbore to indicate if oil in-flow is present in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

1. Biodegradation <Pass rate and Toxicity <10ppm

RG1	г О -	01-	01
	-		-

Product Information	
Registered Chemical Name	RGTO-01-01
Supplier	Resman AS
Registered Category	Gold
Function/Application	Tracer Chemical
Use	Used during drilling operations as a chemical tracer. Inserted at pre-determined points along the producing zone within the wellbore to indicate if oil in-flow is present in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

1. Biodegradation <Pass rate and Toxicity <10ppm

RGTO-01-02		
Product Information		

Registered Chemical Name	RGTO-01-02
Supplier	Resman AS
Registered Category	Gold
Function/Application	Other
Use	Used during drilling operations as a chemical tracer. Inserted at pre-determined points along the producing zone within the wellbore to indicate if oil in-flow is present in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

1. Log Pow >3 and Toxicity <10ppm

RG	TO-04	1-01

Product Information	
Registered Chemical Name	RGTO-04-01
Supplier	Resman AS
Registered Category	Gold
Function/Application	Tracer Chemical
Use	Used during drilling operations as a chemical tracer. Inserted at pre-determined points along the producing zone within the wellbore to indicate if oil in-flow is present in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

1. Biodegradation <Pass rate and Toxicity <10ppm

|--|

Product Information	
Registered Chemical Name	RGTW-001
Supplier	Resman AS
Registered Category	Gold
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-004	

Product Information	
Registered Chemical Name	RGTW-004
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-010	

Product Information	
Registered Chemical Name	RGTW-010
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-01-01	
Product Informati	

FIGURE	
Registered Chemical Name	RGTW-01-01
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-01-02 Product Information

roudet information	
Registered Chemical Name	RGTW-01-02
Supplier	Resman AS
Registered Category	Silver
Function/Application	Other
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

Reason why substance(s) are identified as a candidate for substitution

RGTW-0	<u>4-01</u>
Product	Informatio

Product Information	
Registered Chemical Name	RGTW-04-01
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-04-02	
Product Informati	

FIGUUCI IIIOIIIation	
Registered Chemical Name	RGTW-04-02
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-10-02		
Product Informat	· i /	

Product information	
Registered Chemical Name	RGTW-10-02
Supplier	Resman AS
Registered Category	Silver
Function/Application	Tracer Chemical
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

RGTW-24-02	
Product Informat	·i,

Product Information	
Registered Chemical Name	RGTW-24-02
Supplier	Resman AS
Registered Category	Silver
Function/Application	Dye
Use	Used during production and drilling operations a chemical tracer. Inserted at pre- determined points along the producing zone within the wellbore to indicate the prescence of polar fluids in a particular zone.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products/treatments used and environmental impact.

<u>RX-4433</u>

Product Information	
Registered Chemical Name	RX-4433
Supplier	Roemex Ltd
Registered Category	Silver
Function/Application	Scale Dissolver
Use	Used in well intervention operations as a scale dissolver designed to remove scale.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Dissolution of scale to enhance the productivity of wells.
Reason(s) for non- replacement	 5. Awaiting trial (installation/supplier) 8. Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): Potential substitution free alternative product, RX-4455, is available for trial when a suitable opportunity arises.
	 Other: Alternative scale dissolvers are available, that are technically unsuitable for particular scale.

Reason why substance(s) are identified as a candidate for substitution

RX-5720B	

Product Information	
Registered Chemical Name	RX-5720B
Supplier	Roemex Ltd
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used in pipeline operations as a corrosion inhibitor for long term protection of water flooded vessels and structures.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents corrosive species from attacking the structure and prevents bacteria from depositing on the metal surface.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Supplier continues to identify a replacement substance that does not carry a substitution warning. Currently no substitution free alternative products have been considered viable to trial in the field. Research into alternative products are ongoing by supplier. Currently no alternative products have been considered viable to trial in the field. Further research by the supplier into substitution free alternative products is ongoing.

1. Log Pow >3 and Toxicity <10ppm

RX-5722	_
Product	Information

Registered Chemical	RX-5722
Name	
Supplier	Roemex Ltd
Registered Category	Silver
Function/Application	Corrosion Inhibitor
Use	Used during pipeline and well intervention operations as a corrosion inhibitor for long term protection from corrosion.
Discharge phased out	 N/A One operator did not use in 2020 and has removed from the permit.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Technically specified for long life protection against corrosion which can cause serious consequences if not controlled.
Reason(s) for non- replacement	1. No suitable alternative 8. Other
Evidence in support of continued discharge	 Other: Currently the technology and materials required to produce an effective substitution free product are not available. Currently no alternative products have been considered technically viable. Further research by the supplier into alternative products is ongoing. Supplier is considering testing which may remove the substitution warning from the product. The risks associated with changing an established corrosion inhibitor are considered to be high. As loss of containment, would have a more significant impact than the continued use of the incumbent.

1. Log Pow >3 and Toxicity <10ppm

Product Information	
Registered Chemical Name	RX-7014
Supplier	Roemex Ltd
Registered Category	Silver
Function/Application	Wax Inhibitor
Use	Used in production operations as a wax inhibitor applied to subsea flowlines to prevent solids forming when the fluid temperature falls below the wax appearance temperature (WAT).
Discharge phased out	YesUse discountinued due to decommissioning.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	N/A
Justification for continued use and discharge	N/A
Reason(s) for non- replacement	N/A
Evidence in support of continued discharge	N/A

<u>RX-7025</u>	
Product	Information

Registered Chemical Name	RX-7025
Supplier	Roemex Ltd
Registered Category	Blue
Function/Application	Wax Inhibitor
Use	Used in drilling and production operations as a wax inhibitor that mitigates against wax deposition in subsea infrastructure and pipelines.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Wax deposition in subsea infrastructure and pipelines is a risk to production operations.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Selected following laboratory testing, as the best performing wax inhibitor suitable for subsea use. Substitution free alternative products will be considered during laboratory testing and field trials will take place on identification of a potential alternative product.

1. Biodegradation <pass <10ppm<="" and="" rate="" th="" toxicity=""></pass>	
2. Biodegradation <20%	
3. Biodegradation <pass and="" log="" pow="" rate="">3</pass>	

RX-9025	
Product	Information

Registered Chemical Name	RX-9025
Supplier	Roemex Ltd
Registered Category	Gold
Function/Application	Dye
Use	Used in production and well intervention operations as a dye that can be used at very low concentrations in subsea systems.
Discharge phased out	 N/A One off application in 2020 by one operator will be removed from the 2021 permit.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Detection of leaks is essential in maintaining the safety of subsea systems and installations, minimising unplanned discharges to the marine environment and maintaining production.
Reason(s) for non- replacement	8. Other
Evidence in support of continued discharge	 Other: A substitution free alternative product, RX-9022, is available however the incumbent is more visible and enables leaks to be detected quickly. Best in class for leak tracing and necessary when substitution free dyes have been unsuccessful in detecting leaks. Remains on one operator's permit as a contingency for leak detection of safety valves. Dye is a different colour from alternative product, RX-9022, and can be used when leak testing more than one piece of equipment simultaneously. One operator will only use in future when RX-9022 cannot be used

<u>SA-533</u>	
Product	Information

Registered Chemical Name	SA-533
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive designed to aid the suspension in cement slurries which are subject to high temperatures.
Discharge phased out	 N/A One operator has no plans for future use.
Replacement chemicals	 SA-1015 SA-1015 is a suitable alternative and may be used for lower temperature applications.
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents thinning and particulate separation, which can lead to a poor quality set cement sheath of low compressive strength and higher permeability. These higher permeability sections are prone to attack from corrosive subsurface waters leading to subsequent cement failure.
Reason(s) for non- replacement	 No suitable alternative Compatibility issues with alternative Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Compatibility issues with alternative: Alternative product, SA-1015, is being used in lower temperature applications, high temperature applications may still require the use of SA-533. 5. Awaiting trial (installation/supplier): Supplier is investigating the use of alternative systems which are more environmentally friendly and also technically equivalent. Alternative product, SA-541, based on a differing chemistry is currently being evaluated. Erratic behaviour has been noted in other slurry designs and a solution is being investigated. Supplier plans to test modifications of existing products for feasibility during the first half of 2020. Dependant on outcome, investigation of other
	 chemistries will be carried out along with performance testing. Other: Required for high pressure, high temperature (HPHT) environments where cement quality is critical for both the operational performance and process safety. If alternative products become available they may require further qualification tests prior to full field implementation.

Safezone Wax and Tar Remover

Product Information	
Registered Chemical Name	Safezone Wax and Tar Remover
Supplier	FIS Chemicals Limited
Registered Category	Silver
Function/Application	Wax Dissolver
Use	Used in production operations as a wax dissolver applied to tank walls during slops tank cleaning to remove wax and tar.
Discharge phased out	 Yes No longer required by operator due to decommissioning.
Replacement chemicals	 SAFEZONE WAX AND TAR REMOVE EF Potential alternative currently permitted for use.
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	N/A
Reason(s) for non- replacement	N/A
Evidence in support of continued discharge	N/A

Reason why substance(s) are identified as a candidate for substitution

1. Log Pow >3 and Toxicity <10ppm

Product Information	
Registered Chemical Name	SaltShield TD
Supplier	Halliburton Energy Services
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used during drilling and well intervention operations as a cement additive, developed to increase the flexibility within the cement during the life of the well.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Improves elasticity allowing greater flexibility within the set cement sheath minimising the chances of debonding of the cement from the formation or casing when pressures alter within the well bore. Also efficient at controlling fluid loss when cementing narrow annuli and mitgates against gas migration through the cement column.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Research into alternative systems is ongoing. Currently there are no known technologies to replace the incumbent which will produce the same properties within the set cement column.

OIC	2022
-----	------

Product Information	
Registered Chemical	SCAL11140A
Name	
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Scale Dissolver
Use	Used during production and well intervention operations as a scale inhibitor designed to lower the pH of the produced water to inhibit the formation of CAN (Calcium Naphthenate) deposits.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Critical to the process integrity as initial attempts to control CAN in the process using only acetic acid without the inhibitor was found to be ineffective.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Developed specifically for the application following considerable corrosion compatibility testing. Alternative product, hydrochloric acid, was used during 2018 and proved to be incompatible with well head material / seals. Incumbent was reinstated to minimise the integrity risk associated with injection of acid. Trials prior to 2020 were unsuccessful due to the negative impact upon separation.

1. Biodegradation <20%
2. Biodegradation <pass and="" log="" pow="" rate="">3</pass>
3. Biodegradation <20%
4. Log Pow >3 and Toxicity <10ppm
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
6. Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
7. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>
8. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>
9. Biodegradation <pass <10ppm<="" and="" rate="" td="" toxicity=""></pass>

<u>SCAL16227A</u>

Product Information	
Registered Chemical Name	SCAL16227A
Supplier	Nalco Champion (Nalco Ltd)
Registered Category	Gold
Function/Application	Scale Inhibitor
Use	Used in production operations as a scale inhibitor to prevent build-up of scale in production pipework.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Maintains productivity by preventing scale build up in production pipework.
Reason(s) for non- replacement	 No suitable alternative Awaiting trial (installation/supplier) Other
Evidence in support of continued discharge	 Awaiting trial (installation/supplier): A new substitution free product is currently being commercialised, which will be tested prior to trial on the installation.

Reason why substance(s) are identified as a candidate for substitution

FIGURE		
Registered Chemical Name	SCAL16660A	
Supplier	ChampionX (Champion Technologies Ltd)	
Registered Category	Gold	
Function/Application	Scale Inhibitor	
Use	Used in production and well intervention operations as a scale inhibitor to protect against scale deposits in pipework during scale squeeze treatments.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Provides continued protection from scaling in the reservoir, the near wellbore formation and the production tubular thus maintaining productivity.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Successfully used prior to gaining substitution warning in May 2019. Incumbent provided best protection in laboratory tests on a range of products prior to being selected. Two operators state that no core is available for laboratory tests. Supplier is working towards developing more environmentally acceptable alternative products for use in the North Sea. 	

SCALEGUARD® II NS

Product Information	
Registered Chemical Name	SCALEGUARD® II NS
Supplier	CARBO Ceramics, Inc.
Registered Category	Gold
Function/Application	Proppant
Use	Used in production and drilling operations as a proppant to aid scale inhibition effective during the life of the well.
Discharge phased out	 Yes No further use of product is planned and operator has removed from permit.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	N/A
Reason(s) for non- replacement	N/A
Evidence in support of continued discharge	N/A

Reason why substance(s) are identified as a candidate for substitution

1. Log Pow >3 and Toxicity <10ppm

2. Biodegradation <Pass rate and Toxicity <10ppm

SCALETREAT 837C

Product Information	
Registered Chemical Name	SCALETREAT 837C
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Scale Inhibitor
Use	Used during well intervention operations as a scale inhibitor designed to control scale, primarily as a formation squeeze inhibitor into water source and production formations.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents scale formation in the near well bore area and perforations minimising loss of production.
Reason(s) for non- replacement	1. No suitable alternative
Evidence in support of continued discharge	N/A

Reason why substance(s) are identified as a candidate for substitution

SCALETREAT SD 8015

Product Information			
Registered Chemical Name	SCALETREAT SD 8015		
Supplier	Clariant Oil Services UK Ltd		
Registered Category	Gold		
Function/Application	Scale Dissolver		
Use	Used during production and well intervention operations as a scale dissolver designed to clear the perforations of scale by dispersing non dissovable deposits from water wet oil droplets.		
Discharge phased out	 N/A One operator has transferred asset to another operator. 		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Νο		
Justification for continued use and discharge	Formulated to avoid formation damage effects due to clay or iron hydroxide plugging.		
Reason(s) for non- replacement	1. No suitable alternative 8. Other		
Evidence in support of continued discharge	 Other: Only used during severe scale remediation operations when the routine dissolver has proven ineffective by one operator. No commercially available alternative has a more environmentally acceptable profile that can resolve severe scale issues. 		

Reason why substance(s) are identified as a candidate for substitution

SCALETREAT XL30L

Product Information		
Registered Chemical Name	SCALETREAT XL30L	
Supplier	Clariant Oil Services UK Ltd	
Registered Category	Gold	
Function/Application	Scale Inhibitor	
Use	Used during well intervention operations as the main scale inhibitor due to its enhanced retention time within the reservoir to combat scale.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Formulated to enhance retention time up to two to three times longer than those using conventional squeeze treatment chemicals. Thus reducing the number of scale squeeze operations to be performed and frequency of discharge.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Product can deliver significant cost savings in chemical use and production. Laboratory testing of an alternative substance with similar performance and possibly an improved environmental profile is ongoing to demonstrate the substance can be successfully formulated into the existing product. Product is expected to be available in one year, though further laboratory tests may be required for individual applications. 	

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

Product Information		
Registered Chemical Name	SCW82556	
Supplier	Baker Hughes Limited	
Registered Category	Silver	
Function/Application	Scale Inhibitor	
Use	Used during production operations as a scale inhibitor designed to prevent topside scale formation at various wellheads.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	Provides superior performance in preventing topsides scale formation compared to substitution free alternative products which interfere with the analysis of squeeze inhibitor residuals once fluids are co-mingled.	
Reason(s) for non- replacement	8. Other	
Evidence in support of continued discharge	 Other: No trials due to lack of bedspace and Covid-19. Test work to investigate changeover to substitution free alternative product, SCW83263, is planned for 2021. Possible alternative product, SCW83263, will require commercial assessment due to increased cost over the incumbent. Incumbent provides superior perfomance compared to substitution free products currently available. Investigations into substitution free alternative products that do not interfere with analysis of squeeze inhibitor residuals are on-going. 	

SD-4108	
Product	Infor

Product Information		
Registered Chemical Name	SD-4108	
Supplier	Schlumberger Production Technologies	
Registered Category	Gold	
Function/Application	Scale Dissolver	
Use	Used in well intervention operations as ascale dissolver to facilitate the removal of scales from oilfield systems.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	No	
Justification for continued use and discharge	Formulated to remove scales therefore avoiding formation damage effects due to plugging.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Supplier is researching alternative products with improved environmental qualities to trial. The incumbent is used in a way to limit exposure to the environment. 	

1. Biodegradation <Pass rate and Log Pow >3

SDA-180	<u>)</u>
Product	Information

Registered Chemical Name	SDA-180	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Well Stimulation Chemical	
Use	Used during production and well intervention operations as a well stimulation chemical during scale squeeze treatments to ensure protection of the perforations and near wellbore area.	
Discharge phased out	 N/A One operator has replaced product, no information on replacement. 	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Effective in enhancing production by opening up formations through chemical reaction or pressure.	
Reason(s) for non- replacement	 No suitable alternative Other 	
Evidence in support of continued discharge	 Other: Supplier is working towards a new formulation that replaces the substance. No suitable alternative formulation has been identified. No suitable alternative products have been identified with equivalent technical properties and performance levels. Supplier is currently collating data to support the removal of the substitution warning or develop an alternative product with superior environmental properties. 	

1. Biodegradation <Pass rate and Log Pow >3

<u>SEM 8</u>	
Product	Information

Registered Chemical Name	SEM 8	
Supplier	Halliburton Energy Services	
Registered Category	Gold	
Function/Application	Cement or Cement Additive	
Use	Used during production, drilling and well intervention operations as a cement additive used to clean the well hore and create a barrier between the mud systems and cement	
Discharge phased out	 N/A One operator has no plans for further use. 	
Replacement chemicals	 SEM-1205 Substitution free product, SEM-1205 is available for use, however, is not suitable for all applications. 	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Ensures integrity of the cement bonds. This makes the fluid more compatible with the mud system used in the well and for high temperature situations and operations.	
Reason(s) for non- replacement	 No suitable alternative Trial ongoing Awaiting trial (installation/supplier) 	
Evidence in support of continued discharge	 Trial ongoing: Potential replacement product, SEM-1205, was used on one site whilst the incumbent was used on another in 2020. Awaiting trial (installation/supplier): Compatibility testing of potential replacement product, SEM-1205, is to be conducted to ensure suitability for replacement. Other: Several operators have replaced incumbent with SEM-1205 in all applications where it is technically acceptable. Incumbent remains on permits as a contingency for high pressure, high temperature (HPHT) wells due to compatability issues with replacement product. One operator states potential replacement product has been identified and will be investigated for use in future operations. Other products used for this purpose also have similar environmental profiles. 	

1. Log Pow >3 and Toxicity <10ppm
| SI-4038 | |
|---------|--------|
| Product | Inform |

Product Information	
Registered Chemical Name	SI-4038
Supplier	Schlumberger Production Technologies
Registered Category	Gold
Function/Application	Scale Inhibitor
Use	Used during drilling and well intervention operations as a scale inhibitor to prevent scale formation.
Discharge phased out	N/A
Replacement chemicals	SI-414NOne operator states SI-414N is a suitable replacement.
Trials Undertaken (Yes or No)	No
Justification for continued use and discharge	Prevents scale formation in a range of brines and completion fluid applications without compatibility problems. Also remains stable at elevated temperatures.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: SI-414N has been identified as a replacement product by one operator for a specific application, suitability to be confirmed. Potential replacement products have been identified by two operators which require to be verified as suitable before use. Formulated specifically to meet the demand for improved scale control in oilfield production operations in the North Sea. Research is on-going by supplier to identify alternative products with improved environmental performance whilst retaining the required technical performance, none have currently been identified.

SICI10000A Product Information

FIGURE	
Registered Chemical Name	SICI10000A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Scale Inhibitor
Use	Used during production operations as a scale inhibitor, injected at the wellheads to prevent scale formation between the wellhead and the topsides facility.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents corrosion and maintain integrity of the carbon steel flowlines.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 8. Other A review to identify substitution free alternative products is on-going. The number of alternative products is currently very limited.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Toxicity <10ppm

2. Log Pow >3 and Toxicity <10ppm
3. Log Pow >3 and Toxicity <10ppm
 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>

SICI	112	231/	<u>\</u>

Product Information	
Registered Chemical Name	SICI11231A
Supplier	ChampionX (Champion Technologies Ltd)
Registered Category	Gold
Function/Application	Corrosion Inhibitor
Use	Used during production operations as a corrosion inhibitor, to prevent scale formation between the wellhead and the topsides facility.
Discharge phased out	 N/A No longer in use by one operator post Cessation of Production (CoP) No longer required following CoP on one installation of one operator.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Prevents corrosion and maintain integrity of the carbon steel flowlines.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: The change out of the incumbent in 2021 is dependent on the stability of the process in the field to allow monitoring of the impact on oil in water levels following the introduction of the alternative product. Any suitable alternative product identified would require extensive umbilical and fluid performance testing to overcome the potential for blockages.

Soltex[®] E Additive

Product Information	
Registered Chemical Name	Soltex [®] E Additive
Supplier	Drilling Specialties Company LLC
Registered Category	Gold
Function/Application	Shale Inhibitor / Encapsulator
Use	Used during drilling operations as a shale inhibitor/ encapsulator for lubrication and for the control of shale, high pressure, high temperature (HPHT) fluid loss, torque reduction and formation damage.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Best available product that works as required to withstand difficult wellbore conditions usually found in the lower sections.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Supplier is working to identify a suitable replacement product with similar properties and environmental profile, this is proving difficult. When used in water based drilling fluids it may or may not be discharged to the environment depending on the environmental impact of the total formulation.

Reason why substance(s) are identified as a candidate for substitution

1. Biodegradation <Pass rate and Log Pow >3

Spacer Additive D259

Product Information	
Registered Chemical Name	Spacer Additive D259
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used in drilling operations as a cement additive to improve non-aqueous fluid (NAF) removal and prevent comingling of the mud and cement slurry.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Designed to improve NAF removal during cementing operations to avoid cement contamination, unpredictable thickening time and setting properties.
Reason(s) for non- replacement	 No suitable alternative Other.
Evidence in support of continued discharge	Other:Good zonal isolation and effective mud removal.

Reason why substance(s) are identified as a candidate for substitution

Spacer Solvent D241A

Product Information	
Registered Chemical Name	Spacer Solvent D241A
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Gold
Function/Application	Cement or Cement Additive
Use	Used in drilling operations as a cement additive to improve non-aqueous fluid (NAF) removal and prevent comingling of the mud and cement slurry.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Designed to improve NAF removal during cementing operations to avoid cement contamination, unpredictable thickening time and setting properties.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	Other:Good zonal isolation and effective mud removal.

Reason why substance(s) are identified as a candidate for substitution

1. Log Pow >3 and Toxicity <10ppm
2. Log Pow >3 and Toxicity <10ppm

SRW859	76
Product	Information

Product information	
Registered Chemical Name	SRW85976
Supplier	Baker Hughes Limited
Registered Category	Silver
Function/Application	Scale Dissolver
Use	Used in production and well intervention operations as a scale dissolver during acid washes of individual wells. Also acts as a pH reducer in cooling medium and separation systems.
Discharge phased out	 N/A To be removed from one installation's permit in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Dissolves scale and to enhance the productivity of wells. Used to regulate the pH in cooling medium to prevent corrosion and maintain integrity of pipework and topsides.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Awarded a substitution warning during 2020. Supplier is investigating with the aim to have the substitution warning removed. No plans to be replace as usage of incumbent is considered case by case basis.

Registered Chemical	SUPER SWEEP
Name	
Supplier	M-I Drilling Fluids UK Limited
Registered Category	Silver
Function/Application	Lost Circulation Material
Use	Used during drilling and well intervention operations as a lost circulation material designed to improve hole cleaning when added to pills.
Discharge phased out	N/AOne operator has no plans to use in 2021.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Used for deviated wells and casing milling to minimise stuck pipe and operational delays as traditional pills may be less effective.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Traditional pills have limited efficiency especially in milling operations More environmentally acceptable alternative products have been evaluated, these have incompatibility issues. Only used in a few very specialised and infrequent circumstances.

SURFACTANT GELLING AGENT J590

Product Information	
Registered Chemical Name	SURFACTANT GELLING AGENT J590
Supplier	Schlumberger Oilfield UK Plc
Registered Category	Silver
Function/Application	Gelling Chemical
Use	Used in drilling and well intervention operations as a gelling agent to form a new generation of fluids with similar rheological and clean-up performance to current fluids.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Yes
Justification for continued use and discharge	Used to transport fluid efficiently into fractures to minimise fluid loss and formation damage.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Investigations into alternative products are ongoing, none are as efficient as the incumbent.

Reason why substance(s) are identified as a candidate for substitution

Tracerco	o™ 1	58a	
Product	Info	rma	tic

Product information	
Registered Chemical Name	Tracerco™ 158a
Supplier	Tracerco Ltd
Registered Category	Gold
Function/Application	Tracer Chemical
Use	Used during drilling and production operations as a chemical tracer inserted into different locations within the wellbore for zonal identification of water breakthrough / inflow and the presence of other polar fluids.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Essential in allowing the product to fulfil its design criteria of stability for analysis by persisting down-hole and being detectable upon the return with the produced fluids.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Tracer s can be detected at very low limits of detection (LOD). Supplier is researching into the development of more sensitive tracers and analysis systems, that will require less tracer to be used. Tracers allow for a better understanding of the well for future field development. Can result in a potential reduction of the overall amount of products / treatments used and environmental impact.

WATA-WAX AND TAR REMOVER

Product Information	
Registered Chemical Name	WATA-WAX AND TAR REMOVER
Supplier	FIS Chemicals Limited
Registered Category	Silver
Function/Application	Detergent / Cleaning Fluid
Use	Used in production operations as a detergent or cleaning fluid to clean internal components and walls of topside equipment of wax and tar deposits.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Highly effective in the removal of in-situ deposits where access to pipe work, hydrocyclone liners, coolers etc. is limited which could result in excessive down time if not removed.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Selected for use prior to the substitution warning being awarded in April 2020.Only required by one operator during shut downs and vessel cleanouts. Rarely used by one operator and remains on permit as a contingency. Substitution free alternative product, WAX AND TAR REMOVER EF, is available. One operator has identified a potential replacement product, Ecotrol RD.

Reason why substance(s) are identified as a candidate for substitution

WAXTREAT DF 12634

Product Information	
Registered Chemical Name	WAXTREAT DF 12634
Supplier	Clariant Oil Services UK Ltd
Registered Category	Gold
Function/Application	Wax Inhibitor
Use	Used in production operations as a wax inhibitor to inhibit against wax deposition in the subsea pipeline and topsides pipework.
Discharge phased out	 Operator has removed from one installation's 2021 permits.
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Best in class inhibitor with improved performance over the incumbent. Newly selected for essential use to maintain production.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	 Other: Enhances the performance on heavier crude oils. Compatible with other standard subsea umbilical substances. Several alternative products are currently being reviewed and evaluated by the supplier. The supplier anticipates the product should remain in the oil phase and not be discharged.

Reason why substance(s) are identified as a candidate for substitution

<u>WCW85359</u>

Product Information		
Registered Chemical Name	WCW85359	
Supplier	Baker Hughes Limited	
Registered Category	Silver	
Function/Application	Scale Inhibitor	
Use	Used during production and pipeline operations as a scale and corrosion inhibitor to protect the flowlines on subsea tiebacks.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Yes	
Justification for continued use and discharge	Critical for integrity reasons to provide continued corrosion protection until a suitable alternative product is fully qualified.	
Reason(s) for non- replacement	 No suitable alternative Compatibility issues with alternative Other 	
Evidence in support of continued discharge	 Compatibility issues with alternative: Supplier has trialled a substitution free alternative product. Initial testing showed a reduction in effectiveness compared to the incumbent. Other: Work to identify a replacement product is on hold while a chemical supply contract review is carried out. During a laboratory study no potential alternative products were identified due to the complex chemistry of incumbent. Product within in pipelines that are awaiting decommissioning. 	

Reason why substance(s) are identified as a candidate for substitution

 Biodegradation <pass and="" log="" pow="" rate="">3;Toxicity <10ppm</pass>
2. Log Pow >3 and Toxicity <10ppm

WCW85385	

Product Information	
Registered Chemical Name	WCW85385
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Scale Inhibitor
Use	Used in production operations as a scale and corrosion inhibitor, applied at the installation wellheads to minimise scale and corrosion risks in the production manifold when incompatible waters mix.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Minimises the risk of process pipework failures due to corrosion which could result in an uncontrolled leak that poses environmental and safety concerns. Uncontrolled scale deposits could result in blockages within the topsides process. This could negatively impact process stability leading to an increase discharge of oil via the produced water discharge.
Reason(s) for non- replacement	 No suitable alternative. Other
Evidence in support of continued discharge	 Other: Incumbent is required due to limited chemical injection facilities in the field. Few chemistries exist that are effective at both scale and corrosion inhibition and can be mixed together in a final product, ensuring performance and stability. Supplier is investigating substitution free alternative chemistries that give required performance and stability. Alternative products are currently at the laboratory development stage.

WCW85458UC Product Informatio

Registered Chemical Name	WCW85458UC
Supplier	Baker Hughes Limited
Registered Category	Gold
Function/Application	Scale Inhibitor
Use	Used during production operations as a scale and corrosion inhibitor to protect flowlines and topsides equipment.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Minimises the risk of process pipework failures due to corrosion which could result in an uncontrolled leak that poses environmental and safety concerns. Uncontrolled scale deposits could result in blockages within the topsides process. This could negatively impact process stability leading to an increase discharge of oil via the produced water
	discharge.
Reason(s) for non- replacement	discharge. 1. No suitable alternative 8. Other

Reason why substance(s) are identified as a candidate for substitution

WCW88018	
Product Information	

FIGUUCEIIIIOIIIIation		
Registered Chemical Name	WCW88018	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Corrosion Inhibitor	
Use	Used in production operations as a combined scale and corrosion inhibitor to minimise corrosion in production well flowlines.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Minimises the risk of process pipework failures due to corrosion which could result in an uncontrolled leak that poses environmental and safety concerns. Uncontrolled scale deposits could result in blockages within the topsides process. This could negatively impact process stability leading to an increase discharge of oil via the produced water discharge.	
Reason(s) for non- replacement	1. No suitable alternative 8. Other	
Evidence in support of continued discharge	 Other: Incumbent is required due to limited chemical injection facilities in the field. 	

WellLife Cement Blend Product Information

Product Information		
Registered Chemical Name	WellLife Cement Blend	
Supplier	Halliburton Energy Services	
Registered Category	Gold	
Function/Application	Cement or Cement Additive	
Use	Used during drilling operations as a cement additive designed to provide fluid loss control and to prevent gas migration. Also increases the flexibility within the cement during the life of the well.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Trials Undertaken (Yes or No) Justification for continued use and discharge	No Used for safety critical applications such as gas migration control, cementing across salt formations or high pressure, high temperature (HPHT) work where the use of this product is still required and must be applied. Product decreases setting times removing the requirement for remedial cement operations to cure potential dangererous annulus gas flow.	
Trials Undertaken (Yes or No) Justification for continued use and discharge Reason(s) for non- replacement	No Used for safety critical applications such as gas migration control, cementing across salt formations or high pressure, high temperature (HPHT) work where the use of this product is still required and must be applied. Product decreases setting times removing the requirement for remedial cement operations to cure potential dangererous annulus gas flow. 1. No suitable alternative 8. Other	

Reason why substance(s) are identified as a candidate for substitution

Product Information	Product Information		
Registered Chemical Name	WellLife TD		
Supplier	Halliburton Energy Services		
Registered Category	Gold		
Function/Application	Cement or Cement Additive		
Use	Used during drilling operations as a cement additive designed to provide fluid loss control and to prevent gas migration. Also increases the flexibility within the cement during the life of the well.		
Discharge phased out	N/A		
Replacement chemicals	N/A		
Trials Undertaken (Yes or No)	Νο		
Justification for continued use and discharge	Used for safety critical applications such as gas migration control, cementing across salt formations or high pressure, high temperature (HPHT) work where the use of this product is still required and must be applied. Product decreases setting times removing the requirement for remedial cement operations to cure potential dangererous annulus gas flow.		
Reason(s) for non- replacement	 No suitable alternative Other 		
Evidence in support of continued discharge	 Other: Currently there are no known technologies to replace the incumbent which will produce the same properties within the set cement column. Research into alternative products is ongoing. 		

<u>WHF 1149</u>		
Product	Information	

rioduct information	
Registered Chemical Name	WHF 1149
Supplier	Baker Hughes Limited
Registered Category	D
Function/Application	Hydraulic Fluid
Use	Used during decommissioning, production and well intervention operations as a hydraulic fluid for valve actuation blow out preventers (BOP), well head valves and other safety critical hydraulically operated equipment.
Discharge phased out	N/A
Replacement chemicals	N/A
Trials Undertaken (Yes or No)	Νο
Justification for continued use and discharge	Substance responsible for the substitution warning is currently the only viable substance available to industry for use in this function and must be applied.
Reason(s) for non- replacement	 No suitable alternative Other
Evidence in support of continued discharge	Other:Incumbent is established and any change out would be complex.

|--|

<u>XC85717</u>		
Product	Information	

FIGUACE		
Registered Chemical Name	XC85717	
Supplier	Baker Hughes Limited	
Registered Category	Gold	
Function/Application	Biocide	
Use	Used in well intervention operations as a biocide to control microbiological activity in seawater.	
Discharge phased out	N/A	
Replacement chemicals	N/A	
Trials Undertaken (Yes or No)	Νο	
Justification for continued use and discharge	Regular biocide treatments are necessary to prevent microbially induced corrosion that lead to problems with asset integrity.	
Reason(s) for non- replacement	8. Other	
Evidence in support of continued discharge	 Other: Recently awarded a substitution warning, currently no substitution free alternative products meet the technical requirements of the incumbent. The substance recently awarded a substitution warning is essential to the product function. 	

1. Biodegradation <Pass rate and Toxicity <10ppm



OSPAR Secretariat The Aspect 12 Finsbury Square London EC2A 1AS United Kingdom t: +44 (0)20 7430 5200 f: +44 (0)20 7242 3737 e: secretariat@ospar.org www.ospar.org

Our vision is a clean, healthy and biologically diverse North-East Atlantic Ocean, which is productive, used sustainably and resilient to climate change and ocean acidification.

Publication Number:913/2022

© OSPAR Commission, 2022. Permission may be granted by the publishers for the report to be wholly or partly reproduced in publications provided that the source of the extract is clearly indicated.

© Commission OSPAR, 2022. La reproduction de tout ou partie de ce rapport dans une publication peut être autorisée par l'Editeur, sous réserve que l'origine de l'extrait soit clairement mentionnée.