



เอกสารแนบ 1-4
บันทึกรายการกากของเสีย ระยะเจาะหลุมผลิต



REVISION DATE: 15-11-15

SDS NO.: 10432



SAFETY DATA SHEET CALCIUM CHLORIDE (ALL GRADES)

1 IDENTIFICATION OF THE SUBSTANCE/Preparation and of the Company/undertaking

PRODUCT NAME	CALCIUM CHLORIDE (ALL GRADES)		
APPLICATION	Drilling fluid additive		
SUPPLIER	Mi SWACO A Schlumberger Company Enterprise Drive Auroral Business Park, Westhill Aberdeen AB32 6UF Scotland UK T +44 (0)1224 742200 F +44 (0)1224 742208 E-mail = MISWACO.EU@mi-swaco.com (24 Hour) Europe +44 (0) 1235 239 670, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Middle East and Africa +44 (0) 1235 239 671, Australia +61 2801 44558.		
EMERGENCY TELEPHONE			

2 HAZARD IDENTIFICATION

CLASSIFICATION (1989/45)	XN36		
CLASSIFICATION (EC 1272/2008)			
	Physical	Not classified	
	Health	Eye Irrit. 2, H319	
	Environmental	Not classified	
LABEL IN ACCORDANCE WITH (EC) NO. 1272/2008			



SIGNAL WORD	Warning		
HAZARD STATEMENTS			
	H319	Causes serious eye irritation.	
PRECAUTIONARY STATEMENTS			
	P264	Wash ... thoroughly after handling	
SUPPLEMENTARY PRECAUTIONARY STATEMENTS			
	P280	Wear protective gloves/protective clothing/eye protection/face protection.	
	P305+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	
	P313	Get medical advice/attention.	

3 COMPOSITION/INFORMATION ON INGREDIENTS

CALCIUM CHLORIDE	60-100%		
CAS-No.: 10043-52-4	EC No.: 233-140-8		
CLASSIFICATION (EC 1272/2008)	CLASSIFICATION (R75/48)		
Eye Irrit. 2 - H319	20/219		

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16

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CALCIUM CHLORIDE (ALL GRADES)

COMPOSITION COMMENTS
The data shown is in accordance with the latest EC Directives.

4 FIRST-AID MEASURES

INHALATION
Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

INGESTION
Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

SKIN CONTACT
Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

EYE CONTACT
Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

8 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA
Use fire-extinguishing media appropriate for surrounding materials.

SPECIAL FIRE FIGHTING PROCEDURES
Containers close to fire should be removed immediately or cooled with water.

UNUSUAL FIRE & EXPLOSION HAZARDS
High concentrations of dust may form explosive mixture with air.

SPECIFIC HAZARDS
Fire or high temperatures create: Vapours/gaseous/fumes of Chlorine.

PROTECTIVE MEASURES IN FIRE
Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS
Wear protective clothing as described in Section 8 of this safety data sheet.

ENVIRONMENTAL PRECAUTIONS
Do not allow to enter drains, sewers or watercourses.

SPILL/CLEAN UP METHODS
Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS
Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation.

STORAGE PRECAUTIONS
Store in tightly closed original container in a dry, cool and well-ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT COMMENTS			
NH ₄ + Nauseous dust, WEI TW4 Amg(m) Respirable Dust, 10 mg/m3 Total Dust.			
PROTECTIVE EQUIPMENT			

ENGINEERING MEASURES
Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT
No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. Dust filter P2 (for fine dust).

Safety data sheet number M10290
Version 7
Revision date 09/Jul/2015
Supersedes date 15/Apr/2013



Safety Data Sheet LIME

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier.

Product name	LIME
Product code	M10290
Synonyms	CALCIUM HYDROXIDE, HYDRATKALK
Norway Pr. no.	46236
Denmark Pr. no.	342757

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Recommended use	pH modifier
Uses advised against	Consumer use

1.3 Details of the supplier of the safety data sheet.

Supplier identification
M1 Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill Industrial Estate
Westhill, AB32 6TG
Scotland UK
+41 51577424
MISD@slb.com

1.4 Emergency Telephone Number.

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture.

Regulation (EC) No. 1272/2008

Health hazards	
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Environmental hazards	Not classified
Physical Hazards	Not classified

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CALCIUM CHLORIDE (ALL GRADES)

HAND PROTECTION
For prolonged or repeated skin contact use suitable protective gloves. Nitrile, Neoprene, or Rubber gloves are recommended.

EYE PROTECTION
Wear approved chemical safety goggles where eye exposure is reasonably probable.

OTHER PROTECTION
Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Powder, dust		
COLOR	White / off-white		
ODOUR	Odourless		
SOLUBILITY	Completely soluble in water		
MOL. WEIGHT	111	BOLING POINT (°C)	> 1600
MELTING POINT (°C)	772	RELATIVE DENSITY	2.1 @ 20 °C
PARTICLE SIZE (Micron)	<200		
SOLUBILITY VALUE (g/100g H ₂ O@20°C)	60-75	pH-VALUE, DILUTED SOLUTION	7-10.5

10 STABILITY AND REACTIVITY

STABILITY
Stable under normal temperature conditions and recommended use.

CONDITIONS TO AVOID
Avoid contact with water. Hygroscopic.

MATERIALS TO AVOID
Avoid contact with: Metals.

HAZARDOUS DECOMPOSITION PRODUCTS
Fire or high temperatures create: Vapours/gaseous/fumes of Chlorine.

11 TOXICOLOGICAL INFORMATION

INHALATION
Dust may irritate respiratory system or lungs.

INGESTION
May irritate and cause stomach pain, vomiting and diarrhoea.

SKIN CONTACT
Irritating and may cause redness and pain.

EYE CONTACT
Irritating to eyes. Particles in the eyes may cause irritation and smarting.

12 ECOLOGICAL INFORMATION

ECOTOXICITY
Contact Mi SWACO's QHSE Department for ecological information at env@mi-swaco.com.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS
Recover and recycle or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

14 TRANSPORT INFORMATION

GENERAL
The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RSD).

15 REGULATORY INFORMATION

UK REGULATORY REFERENCES
Chemicals Hazard Information & Packaging Regulations, Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

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CALCIUM CHLORIDE (ALL GRADES)

EU DIRECTIVES
Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1989/EEC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1486/94 as well as Council Directive 76/769/EEC and Commission Directive 91/155/EEC, 93/67/EEC, 93/105/EEC and 2002/15/EC, including amendments.

INTERNATIONAL CHEMICAL INVENTORIES
Contact REACH@mi-swaco.com for REACH information. Complies with the following international chemical inventory requirements: AICS, DIL / NDIL, IECSC, EINECS / ELINCS, METI ENCS, TCOL, ECL, NZIC, PICCS, TSCA.

16 OTHER INFORMATION

GENERAL INFORMATION
HMS Health - 1 HMS Flammability - 0 HMS Physical Hazard - 1 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES
Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers, LOLI, European Chemicals Bureau - EBS (European Chemical Substances Information).

REVISION COMMENTS
General revision. Compiled or Revised by Ewan MacLeod

ISSUED BY
Bill Cameron

REVISION DATE
15-11-10

REV. NO./REPL. SDS GENERATED
4

SDS NO.
10432

RISK PHRASES IN FULL
R36 Irritating to eyes.

HAZARD STATEMENTS IN FULL
H319 Causes serious eye irritation.

DISCLAIMER

MISD furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness. Therefore, user may rely only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



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Revision date 09/Jul/2015

Component	EC-No.	CAS-No	Weight % range	Classification (Reg. 67/548)	Classification (Reg. 1272/2008)	REACH registration number
Calcium hydroxide	215-137-3	1305-62-0	60-100	Xn; R37/38 Xi; R41	Eye Dam. 1 (H361) Skin Irrit. 2 (H315) STOT SE 3 (H335)	09-117475151-40-4 xxx

3.2 Mixtures.

Not Applicable

4. First aid measures

4.1 First Aid

Inhalation
If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion
Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.

Skin contact
Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation persists.

Eye contact
Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get immediate medical attention.

4.2 Most important symptoms and effects, both acute and delayed.

General advice
The severity of the symptoms described will vary dependent of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed.

Notes to physician
Treat symptomatically.

5. Fire-fighting measures



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2.2 Label Elements.



Signal word

DANGER

Hazard statements

H315 - Causes skin irritation

H318 - Causes serious eye damage

H335 - May cause respiratory irritation

Precautionary Statements - EU (428, 1272/2008)

P261 - Avoid breathing dust/fume/gas/mist/vapour/spray
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P501 - Dispose of contents/container in accordance with local regulations.

Supplementary precautionary statements.
P264 - Wash face, hands and any exposed skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P284 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P362 - Take off contaminated clothing and wash before re-use
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

*

Contains Calcium hydroxide

2.3 Other data.

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Hazardous according to the criteria of NOHSC.

HAZARDOUS SUBSTANCE. NON-DA

3. Composition/information on ingredients

3.1 Substances.



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5.1 Extinguishing media.

Suitable extinguishing media

Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons

Water.

5.2 Special hazards arising from the substance or mixture

None known.

5.3 Advice for firefighters.

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures.

Use personal protective equipment. See also section 8.

6.2 Environmental precautions.

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up.

Methods for Containment

Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.

Methods for cleaning up

Avoid dust formation. Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections.

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling.

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

Hygiene measures
Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2. Conditions for safe storage, including any incompatibilities.
Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Technical measures/precautions
Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Avoid contact with: Acids

Storage class
Chemical storage.

Packaging material
Use specially constructed containers only.

7.3. Specific end uses.
See also Section 1.2.

8. Exposure controls/personal protection

Component	EU OEL - Third List	Austria	Australia	Denmark
Calcium hydroxide	Not determined	Not determined	5 mg/m ³ TWA	5 mg/m ³ TWA
Component	Malaysia	France	Germany	Hungary
Calcium hydroxide	5 mg/m ³ TWA	5 mg/m ³	1 mg/m ³ TWA	Not determined
Component	New Zealand	Norway	Netherlands	Norway
Calcium hydroxide	5 mg/m ³ TWA	Not determined	5 mg/m ³	5 mg/m ³ TWA 10 mg/m ³ STEL
Component	Poland	Portugal	Romania	Russia
Calcium hydroxide	2 mg/m ³ TWA, MCS	5 mg/m ³ TWA, indicative limit value	5 mg/m ³ TWA	2 mg/m ³ MAC
Component	Spain	Switzerland	Turkey	UK
Calcium hydroxide	5 mg/m ³ TWA, LAE/D	5 mg/m ³ TWA, MAC	5 mg/m ³ TWA	15 mg/m ³ STEL 5 mg/m ³ TWA

Derived No Effect Level (DNEL)

Short term exposure local effects
Calcium hydroxide
Inhalation 4 mg/m³

Long term exposure local effects
Calcium hydroxide
Inhalation 1 mg/m³

Predicted No Effect Concentration (PNEC)
Calcium hydroxide
Fresh Water 0.49 mg/L
Sea Water 0.32 mg/L
Soil 1980 mg/kg
Impact on Sewage Treatment 5 mg/L
Intermittent release 0.49 mg/L

8.2. Exposure controls.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Local exhaust ventilation.

Personal protective equipment

Eye protection
It is good practice to wear Safety Glasses with Side-shields when handling any chemical.

Hand protection
Use protective gloves made of: Nitrile. Frequent change is advisable.

Respiratory protection
Half mask with a particle filter P2 (BS EN 143). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

Skin and body protection

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.



9. Physical and chemical properties

Specific target organ toxicity (single Category 3 exposure)
Specific target organ toxicity (repeated exposure) Not classified.

Target organ effects
Respiratory system.

Aspiration hazard
No hazard from product as supplied.

12. Ecological information

12.1. Toxicity.
The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

Based on PLONOR test or OSPAR

Toxicity to algae
This product is not considered toxic to algae.

Toxicity to fish
This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Calcium hydroxide	90 mg/L, LC50 (Salmella affinis) 96 h	No information available	No information available

12.2. Persistence and degradability.

Not Applicable - Inorganic chemical.

12.3. Bioaccumulative potential.

Not Applicable - Inorganic chemical.

12.4. Mobility in soil.

The product is water soluble, and may spread in water systems.

12.5. Results of PBT and vPvB assessment.
Not classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects.

None known.

13. Disposal considerations

13.1. Waste treatment methods.
Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging
Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWG waste disposal No.
Not assigned

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWC waste disposal No. 06 03 14 - solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13 Waste Code: 7132 Inorganic bases.

14. Transport information

14.1. UN number.
Not assigned

14.2. Proper shipping name.
The product is not covered by international regulation on the transport of dangerous goods

14.3. Hazard class(es).
ADR/RID/ADNADO Hazard class Not regulated
IMDG Hazard class Not regulated
ICAO Hazard classification Not regulated

14.4. Packing group.
ADR/RID/ADNADO Packing Group Not regulated
IMDG Packing group Not regulated
ICAO Packing group Not regulated

14.5. Environmental hazard.
No

9.1. Information on basic physical and chemical properties.

Physical state
Solid

Appearance
Powder

Colour
Off-white

Odor threshold
Not applicable

Property
pH 12.4

pH @ dilution
Melting/freezing point > 450 °C / > 842 °F

Boiling point/range
No information available

Flash Point
No information available

Evaporation rate
No information available

Flammability (solid, gas)
Not Applicable

Flammability Limits in Air
Upper Flammability Limit Not applicable

Lower flammability limit
No information available

Vapor pressure
No information available

Vapor density
No information available

Specific gravity
2.24

Bulk density
400 kg/m³

Relative density
No information available

Water solubility
Soluble in water

Solubility in other solvents
No information available

Autoignition temperature
No information available

Decomposition temperature
No information available

Kinematic viscosity
No information available

Viscosity, dynamic
No information available

Log Pow
Not determined

Explosive properties
Not Applicable

Oxidizing properties
None known.

9.2. Other information.
Pour point No information available

Molecular weight
None

VOC content(%)
None

Density VALUE
None

Particle Size (Micron)
< 500

10. Stability and reactivity

10.1. Reactivity.
Exothermic reaction with: Acids.

10.2. Chemical stability.
Stable under normal temperature conditions and recommended use.

10.3. Possibility of Hazardous Reactions.

Hazardous polymerization
Hazardous polymerization does not occur.

10.4. Conditions to avoid.

Avoid dust formation. Protect from moisture.

10.5. Incompatible materials.

Acids. Water.

10.6. Hazardous decomposition products.

See also section 5.2.

11. Toxicological information

11.1. Information on toxicological effects.

Acute toxicity
Inhalation May cause respiratory irritation.

Eye contact
Causes serious eye damage.

Skin contact
Causes skin irritation.

Ingestion
Ingestion may cause stomach discomfort.

Unknown acute toxicity
Not Applicable.

Component	LD50 Oral	LD50 Dermal	LD50 Inhalation
Calcium hydroxide	> 7500 mg/kg (Rat)	No data available	No data available

Sensitisation

This product does not contain any components suspected to be sensitizing.

Mutagenic effects

This product does not contain any known or suspected mutagens.

Carcinogenicity

This product does not contain any known or suspected carcinogens.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Routes of exposure

Skin contact, Inhalation, Eye contact.

Routes of entry

Inhalation.

14.4. Special precautions.

Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Please contact MSDS@sb.com for info regarding transport in Bulk.

15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

Germany, Water Endangering Classes (VwVw) Water endangering class = 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons
No Poisons Schedule number allocated

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 789/93 and Commission Regulation (EC) No 1489/04 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/105/EEC and 2000/2/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances (NORSC:1008 (2004) 3rd Edition).

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment (NORSC:1003 (1999)).

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

ADG Code - Australian Dangerous Goods Code.

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 (P.U.(A) 31/2013) (CLASS Regulations)

The Industry Code of Practice on Chemical Classification and Hazard Communication 2014 (P.U. (B) 12/2014) (ICOP) International inventories

USA, Toxic Substances Control Act Inventory (TSCA)
European Union - EINECS and ELINCS
Canada, Domestic Substance List (DSL)

Compiles
Compiles
Compiles

Philippines (PICCS)
Inventory - Japan - Existing and New Chemicals list
China (ECCC)
Australia (ACCS)
Korea (KCCCL)
Inventory - New Zealand - Inventory of Chemicals (NZCoC)

Compiles
Compiles
Compiles
Compiles

Contact REACH@mswaco.slb.com for REACH information.

15.2. Chemical Safety Report.

No information available

16. Other information

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals) - Anne Kanne (Anka) Fosse

Supersedes date
16/Apr/2013

Revision date
09/Jul/2015

Version
7

The following sections have been revised:
All sections. Updated according to GHS/CLP. No changes with regard to classification have been made.

Text of R phrases mentioned in Section 3
R41 - Risk of serious damage to eyes

R37/38 - Irritating to respiratory system and skin

Full text of H-Statements referred to under sections 2 and 3

H315 - Causes skin irritation
H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty, or non-infringement of intellectual property rights, and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name SOLACIDE

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Biocide

Users advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
Solent Chemicals Private
Limited No. 12 New Industrial
Road #03-02A Monnigstar Center
Singapore 536202
T: +65 6383 0138 Fax:
+65 6383 5228
info@solentchemicals.com

1.4 Emergency Telephone Number

Emergency telephone : Singapore +65-63830138 (24 Hour)

2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to (EC) No. 1272/2008

Health hazards		
Acute oral toxicity		Category 4
Acute inhalation toxicity - vapor		Category 2
Skin corrosion/irritation		Category 2
Serious eye/damperative irritation		Category 1
Skin sensitization		Category 1
Specific target organ toxicity (repeated exposure)		Category 1

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements



Solent Chemicals Private Limited (Company Reg. No. 2009147890)
No. 12 New Industrial Road, #03-02A Monnigstar Center, Singapore 536202
Tel: (65) 6383 0138 - Fax: (65) 6383 5228 | info@solentchemicals.com

Signal word
DANGER

Hazard statements

H302 - Harmful if swallowed
H312 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H330 - Fatal if inhaled
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary Statements - EU (687-1272/2008)

P201 - Do not breathe dust/fume/gas/vapor/spray
P203 - Wear protective gloves/protective clothing eye protection/ face protection
P204 + P240 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P303 + P361 + P353 - IF ON SKIN: Wash with plenty of soap and water
P304 + P340 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 - Immediately call a POISON CENTER or doctor/physician
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Supplementary precautionary statements

P264 - Wash face, hands and any exposed skin thoroughly after handling
P271 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear respiratory protection
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P314 - Get medical advice/attention if you feel unwell
P330 - Rinse mouth
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse
P501 - Dispose of contents/ container to an approved waste disposal plant

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Indication of danger

T - Toxic
Xn - Harmful
Xi - Irritant

R-Code(s)

R22, R23, R36, R41, R43, R48/23

Contains

2,2''-(2-hydroxy-1,3,5-triazine-1,3,5-triyl)trianthra

Tetrasodium ethylenediaminetetracetate

2-aminoethanol

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

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6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Do not breathe vapors or spray mist. Keep people away from and upwind of spill/leak. Do not get on skin or clothing.
Wash thoroughly after handling. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so. Dike for ahead of liquid spill for later disposal.

Methods for cleaning up
Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations (see Section 13).

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid spills and splashing during use. Persons susceptible to allergic reactions should not handle this product. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid prolonged exposure. Avoid spilling, skin and eye contact. Avoid inhalation of vapors and spray mists. When using do not smoke, eat or drink.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions

Ensure adequate ventilation. Keep airborne
Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid contact with: Strong acids.

Storage precautions

Storage class Packaging

material 7.3 Specific end

Use specially constructed

uses

See Section 12.

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8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits No biological limit assessed

Derived No Effect Level (DNEL)

Long term exposure local effects 2-aminoethanol 3.3 mg/m³

Long term exposure systemic effects Inhalation 100 mg/l

Intermittent release 0.08 mg/l

2-aminoethanol 1 mg/l

2-aminoethanol 0.085 mg/l

Sea water 0.085 mg/l

Fresh water sediment 0.434 mg/kg

Sea sediment 0.0434 mg/kg

Soil 0.0367 mg/kg

Impact on sewage treatment 100 mg/l

Intermittent release 0.08 mg/l

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Provide adequate general and local exhaust ventilation in work areas. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment. Provide eyewash station and safety shower.

Personal protective equipment

Eye protection

Wear splash-proof chemical safety goggles to prevent any possibility of eye contact. Face shield

Hand protection

Impervious gloves made of: Neoprene, Nitrile, Viton, PVC. Be aware that liquid may penetrate the gloves. Frequent change is advisable.

Respiratory protection

Use respirator with organic vapor protection (A, brown). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used. If there are conditions in which this triazine-containing product produces a vapor, a chemical respirator with A + Formaldehyde and P2 particulate pre-filter combination would be required.

Skin and body protection

Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.

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2.3 Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Hazardous according to the criteria of NQHS.

HAZARDOUS SUBSTANCE. DANGEROUS GOODS

3. Composition/information on ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	EC-No.	CAS-No	Weight % range	Classification (67/548)	Classification (Reg. 1272/2008)
2,2''-(2-hydroxy-1,3,5-triazine-1,3,5-triyl)trianthra	255-208-0	4719-04-4	60-100	Xn; R22 T; R23 T; R42/23 R43 STOT RE 1H372	Acute Tox. 4 (H302) Acute Tox. 2H330 Skin Sens. 1 (H317) STOT RE 1H372
Tetrasodium ethylenediaminetetracetate	200-573-9	64-03-8	1-5	Xn; R22 X; R41	Acute Tox. 4 (H302) Eye Dam. 1B (H318)
2-aminoethanol	205-483-3	141-43-5	1-5	Xn; R20/21/22 C; R34	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Skin Corr. 1B (H314)

Comments

The product contains other ingredients which do not contribute to the overall classification.

4. First aid measures

4.1 First-Aid Measures

Inhalation

Move the exposed person to fresh air at once. Provide fresh air, warmth and rest, preferably in a comfortable upright sitting position. If not breathing, give artificial respiration. If breathing is difficult, give medical oxygen. Get medical attention immediately.

Ingestion

Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Get medical attention immediately.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water for at least 15 minutes. Get medical attention immediately.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Flush immediately with plenty of water, holding the eyelids open. Continue to rinse for at least 15 minutes. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

General advice

Seek medical attention for all burns, regardless how minor they may seem. The severity of the symptoms described will vary dependent of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, fog, mist, dry chemical, carbon dioxide or foam.

Extinguishing media which shall not be used for safety reasons
None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
None known.

Hazardous combustion products
Fire or high temperatures create: Vapours/gases/fumes of: Carbon monoxide (CO), Carbon dioxide (CO2), Nitrogen gases (NOx), Sulfuric gases (SOx)

5.3 Advice for firefighters

Special protective equipment for fire fighters
Self-contained breathing apparatus in positive pressure demand and full protective clothing must be worn in case of fire.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Hazard code ADG

OX

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9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state Liquid
Appearance Colorless
Odor Characteristic
Colorless - Pale yellow
Odor threshold Not applicable

Property Values

pH 8.5 - 11.5
pH @ dilution No information available

Melting/freezing point No information available

Boiling point/range > 100 °C

Flash point > 200 °C

Evaporation rate (Buck-1) No information available

Flammability (solid, gas) Not Applicable

Upper flammability limit Not applicable

Lower flammability limit Not applicable

Vapor pressure No information available

Vapor density No information available

Specific gravity No information available

Bulk density No information available

Relative density 1.15 - 1.16

Water solubility Miscible with water.

Solubility in other solvents No information available

Autoignition temperature >200 °C

Decomposition temperature No information available

Kinematic viscosity No information available

Dynamic viscosity Not information available

Log Pow Not determined

Explosive properties Not Applicable

Oxidizing properties None known.

9.2 Other information

Four point No information available

Molecular weight No information available

VOC content (%) None

Density No information available

10. Stability and reactivity

10.1 Reactivity

Contact with strong acids develops formaldehyde.

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10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid

None known.

10.5 Incompatible materials

Strong oxidizing agents. Nitrates. Strong acids.

10.6 Hazardous decomposition products

See also section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product information This product may contain or release trace amounts of formaldehyde. The International Agency for Research on Cancer (IARC) has classified formaldehyde as a Group 1 carcinogen (limited evidence in humans, sufficient evidence in animals). Exposure to formaldehyde has been linked to adverse reproductive effects in some human and animal studies. In other reproductive studies, however, no adverse effects were noted. (MedWatch). Formaldehyde may also cause skin sensitization (allergic reaction).

Inhalation

Fatal if inhaled. May cause damage to organs through prolonged or repeated exposure.

Eye contact

Causes serious eye irritation.

Skin contact

Causes skin irritation. May cause an allergic skin reaction. Components of the product may be absorbed into the body through the skin.

Ingestion

Harmful if swallowed.

Acute toxicity

LD50 Oral > 1000 - <2000 mg/kg (rat)

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
2,2''-(2-hydroxy-1,3,5-triazine-1,3,5-triyl)trianthra	= 783 mg/kg (Rat)	>2 g/kg (Rat)	No data available
Tetrasodium ethylenediaminetetracetate	= 10 g/kg (Rat)	No data available	No data available
2-aminoethanol	= 1720 mg/kg (Rat)	= 1000 mg/kg (Rabbit)	No data available

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Sensitization May cause sensitization by skin contact.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity This product does not contain any known or suspected carcinogens.

Reproductive toxicity None known.

Routes of exposure Inhalation, Ingestion, Skin contact, Eye contact.

Routes of entry Inhalation, Ingestion, Skin absorption.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (related exposure) Category 1

Target organ effects Respiratory system

Aspiration hazard No hazard from product as supplied

12. Ecological information

12.1 Toxicity
The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)trisethanol	No information available	No information available	No information available
Tetraosodium ethylenediaminetetraacetate	41 mg/L LC50 (Lepomis macrochirus) = 96 h 69.8 mg/L LC50 (Pimephales promelas) = 96 h	1.61 mg/L EC50 (Desmodesmus subspicatus) = 72 h	610 mg/L EC50 (Daphnia magna) = 24 h

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2-aminooethanol	227 mg/L LC50 (Pimephales promelas) = 96 h 384 mg/L LC50 (Brachydanio rerio) = 96 h 300 - 1000 mg/L LC50 (Lepomis macrochirus) >96 h 114 - 186 mg/L LC50 (Oncorhynchus mykiss) = 96 h 200 mg/L LC50 (Oncorhynchus mykiss) = 96 h	15 mg/L EC50 (Desmodesmus subspicatus) = 72 h	65 mg/L EC50 (Daphnia magna) = 48 h
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12.2 Persistence and degradability

Product is biodegradable.

12.3 Bioaccumulative potential

No product level data available.

12.4 Mobility in soil

Mobility
The product is miscible with water. May spread in water systems.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

EWG Waste disposal No. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWC waste disposal No: 07 04 01 Waste Code: 7111 - Pesticides without mercury

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H317 - May cause an allergic skin reaction	H318 - Causes serious eye damage	H330 - Fatal if inhaled	H372 - Causes damage to organs through prolonged or repeated exposure	H373 - Harmful in contact with skin	H314 - Causes severe skin burns and eye damage	H318 - Causes serious eye damage	H332 - Harmful if inhaled
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DISCLAIMER
The information in this Data Sheet applies only to the products described herein and produced or supplied by us. It is based on our experience and on the data available to us at the time of its issue and is accurate to the best of our knowledge. The customer is strongly advised to observe and ensure that their employees, customers or users observe all information contained herein. However, no warranty is made or implied that the information is accurate or complete and we shall not be liable whatsoever arising out of the use of information or the products described herein. Where third party products are used in conjunction with or instead of products produced or supplied customers or users should themselves obtain all necessary technical, health and safety information about such products from third party.

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Safety Data Sheet: Solacide
Version 1
Revision date 20 Feb 2017

Safety data sheet number: M11207
Version 10
Revision date 19/Mar/2015
Supersedes date 17/Nov/2014



Safety Data Sheet
BARITE (ALL GRADES)

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier.

Product name BARITE (ALL GRADES)
Product code M11207
REACH Registration Name Exempt Annex V ENTRY 7.
Denmark P. no. 1154758

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Recommended use Weighing agent.

Uses advised against Consumer use.

1.3 Details of the supplier of the safety data sheet.

Supplier identification
M/I Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill Industrial Estate
Westhill, AB32 8TQ
Scotland UK
+47 21577424
MSDG@sib.com

1.4 Emergency Telephone Number.

Emergency telephone - (24 Hour) Australia +61 2801 44568, Asia Pacific +65 3158 1074, China +86 10 5100 3009, Europe +44 (0) 1235 235 675, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards Not classified
Environmental hazards Not classified
Physical Hazards Not classified

2.2 Label Elements.

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Solutions for a better tomorrow

14.1 UN Number

UN190 No. (ADR/RID/AO/NADO)
UN No. (IMDG)
UN No. (ICAO)

14.2 Proper shipping name
TOXIC LIQUID, ORGANIC, N.O.S. (2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)trisethanol)

14.3 Hazard classes
ADR/RID/AO/NADO Hazard class 6.1
IMDG Hazard class 6.1
ICAO Hazard class/division 6.1

14.4 Packing group
ADR/RID/AO/NADO Packing Group II
IMDG Packing group II
ICAO Packing group II



14.5 Environmental hazard
No

14.6 Special precautions
Hazard identification no (ADR) 60
Ems (IMDG) F-A, S-A
Emergency action code 2X
Tunnel restriction code (DE) 2X
Hatchcode ADD

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Australian Standard for the Uniform Scheduling of Drugs and Poisons

2-aminooethanol
Schedule 4
Schedule 6
Schedule 5

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Safety Data Sheet: Solacide
Version 1
Revision date 20 Feb 2017



Solutions for a better tomorrow

New Zealand hazard classification Classified

HSNO approval no. HSR002625; N.O.S. (Toxic [6.1, 6.7] Group Standard 2006

Group number 6.1B, 6.1D, 6.5B

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition (NOHSC, 2011 (2003)).
National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances (NOHSC:1008 (2004) 3rd Edition).

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment (NOHSC:1003 (1995)).
Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

ADG Code - Australian Dangerous Goods Code.

International inventories

USA (TSCA) Complex
European Union (ENECs and ELINCS) Complex
Canada (DSL) Complex
Philippines (PICCS) Complex
Japan (EWCS) Complex
China (IECS) Complex
Australia (ACCS) Complex
Korean (KECL) Complex
New Zealand (NZOG) Complex

15.2 Chemical Safety Report

No information available

16. Other information

INFORMATION SOURCES - Safety Data Sheet, Misc. manufacturers. Product information provided by the commercial vendor(s).

Text of R phrases mentioned in Section 2 and 3

R22 - Harmful if swallowed
R23 - Toxic by inhalation
R34 - Causes burns
R41 - Risk of serious damage to eyes
R43 - May cause sensitization by skin contact
R38 - Irritating to skin

R48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation
R20/21/22 - Harmful by inhalation, in contact with skin and if swallowed

Full text of H-Statements referred to under sections 2 and 3

H302 - Harmful if swallowed
H315 - Causes skin irritation

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A Schlumberger Company
BARITE (ALL GRADES)

Safety data sheet number M11207
Revision date 19/Mar/2015

Signal word

None

Hazard statements

This product is not classified as hazardous therefore no (H) hazard statements assigned.

Precautionary Statements - EU (528, 1272/2008)

This product is not classified as hazardous therefore no (P) precautionary statements assigned.

-

Classification according to EU Directives 67/540/EEC or 1999/45/EC.

Indication of danger

Not classified

Contains

Crystalline silica (impurity)

For the full text of the Phrases and H-Statements mentioned in this Section, see Section 16.

2.3 Other data.

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Non-hazardous according to the criteria of NOHSC.

NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances.

Component	EC-No.	CAS-No.	Weight % - range	Classification (E7548)	Classification (Reg. 1272/2008)	REACH registration number
Crystalline silica (impurity)	238-78-4	1483-60-7	1-5	Xn, R48/20	STOT Rep. 2 - H373	Exempt

3.2 Mixtures.

Not Applicable

Comments

The product contains other ingredients which do not contribute to the overall classification.

This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis. IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC Classification Group I.

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A Schlumberger Company
BARITE (ALL GRADES)

Safety data sheet number M11207
Revision date 19/Mar/2015

4. First aid measures

4.1 First Aid

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Skin contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed.

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed.

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media.

Suitable extinguishing media
Use extinguishing media appropriate for surrounding material.

Extinguishing media which shall not be used for safety reasons
None known.

5.2 Special hazards arising from the substance or mixture.

Unusual fire and explosion hazards
None known.

Hazardous combustion products
Thermal decomposition can lead to release of irritating gases and vapours.

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Korea (KECL)
Inventory - New Zealand - Inventory of Chemicals (NZIoC)
Contact REACH@miawaco.slb.com for REACH information.

15. Chemical Safety Report.

No information available

16. Other information

Prepared by Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Anne Karls (Anka) Fosca
Supersedes date 17/Nov/2014
Revision date 19/Mar/2015
Version 10

The following sections have been revised 2., 3., 16. Updated according to GHS/CLP.

Text of R phrases mentioned in Section 3

R48/20 - Harmful; danger of serious damage to health by prolonged exposure through inhalation

Full text of H-statements referred to under sections 2 and 3

This product is not classified as hazardous therefore no (H) hazard statements assigned.
H373 - May cause damage to organs through prolonged or repeated exposure if inhaled

Disclaimer
The information contained herein is considered in good faith as reliable of the data issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product, merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

Safety Data Sheet BENTONITE

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product Identifier.

Product name BENTONITE
Product code PID211
Synonyms API BENTONITE, OCMA BENTONITE, WYOMING BENTONITE
REACH Registration Name Exempt Annex V ENTRY 7
Denmark Pt. no. OCMA Bentonite: Pt.No.: 1900124

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Recommended Use Viscocifier.

1.3 Uses advised against

Consumer use

1.4 Details of the supplier of the safety data sheet.

Supplier
801 Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill Industrial Estate
Westhill, AB32 0TG
Scotland UK
+47 51577424
MSDS@slb.com

1.4. Emergency Telephone Number.

Emergency telephone - (24 Hour) Australia +61 2801 44658, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9999 1483, USA 001 281 561 1600.
Denmark Phagen Control Helpline (DS), +45 82 12 12 12
Germany +49 89 222 25295
Norway Poison information centre: +47 22 89 13 00

2. Hazards identification

2.1 Classification of the substance or mixture.

Regulation (EC) No. 1272/2008

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards Not classified

5.3 Advice for firefighters.

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions.

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up.

Methods for containment
Cover powder spill with plastic sheet or tarp to minimise spreading. Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections.

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling.

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities.

Technical measures/precautions
Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions
Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid wet and humid conditions.

Storage class

Chemical storage.

Packaging materials
Use specially constructed containers only

7.3 Specific end uses.

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters.

Exposure Limits No biological limit allocated

Chemical Name	EU OEL - Third List	Austria	Australia	Denmark
Crystalline silica (impurity)	Not determined	0.15 mg/m ³ TWA breathable dust, respirable	0.1 mg/m ³ TWA breathable dust, respirable	0.1 mg/m ³
Chemical Name	Malaysia	France	Germany	Hongary
Crystalline silica (impurity)	0.1 mg/m ³ TWA	0.1 mg/m ³ TWA	0.1 mg/m ³ TWA	0.1 mg/m ³ TWA
Chemical Name	New Zealand	Norway	Norway	Norway
Crystalline silica (impurity)	0.2 mg/m ³ TWA Known or presumed human carcinogen	Not determined	0.075 mg/m ³	0.075 mg/m ³
				0.1 mg/m ³ TWA respirable dust 0.1 mg/m ³ STEL total dust 0.1 mg/m ³ STEL respirable dust dust concentration
Chemical Name	Poland	Portugal	Romania	
Crystalline silica (impurity)	2 mg/m ³ TWA NDS -50% free crystalline silica 0.3 mg/m ³ TWA NDS -50% free crystalline silica 4.0 mg/m ³ TWA NDS 2% to 50% free crystalline silica 1.0 mg/m ³ TWA NDS 2% to 50% free crystalline silica	0.025 mg/m ³ TWA respirable fraction	0.1 mg/m ³ TWA respirable fraction	3 mg/m ³ STEL 1123 dissimulating aerosol total mass of aerosols 3 mg/m ³ STEL 1124 total mass of aerosols 1 mg/m ³ TWA 1123 1 mg/m ³ TWA 1124 Flammable substance physico-regulated under Quartz 1123, 1124
Chemical Name	Spain	Switzerland	Turkey	UK
Crystalline silica (impurity)	0.05 mg/m ³ TWA VLE-EU 0.15 mg/m ³ TWA VLE-EU	0.1 mg/m ³ TWA respirable fraction	Not determined	Not determined

8.2 Exposure controls.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

2.2 Label elements.

Signal word

None

Hazard statements

This product is not classified as hazardous therefore no (H) hazard statements assigned.

Precautionary Statements - EU (528, 1272/2008).

This product is not classified as hazardous therefore has no (P) precautionary statements assigned.

-

Contains

Crystalline silica (impurity)

2.3 Other data.

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.

NON-HAZARDOUS SUBSTANCE. NON-DAINGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances.

Chemical Name	EC-No.	CAS No	Weight-%	Classification (67/48)	Classification (Reg. 1272/2008)	REACH registration number
Crystalline silica (impurity)	238-875-4	14828-60-7	1-5	Xn, R48/20	STOT Rep. 2 - H373	Exempt

3.2 Mixtures.

Not applicable

Comments

Naturally occurring mineral.

This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis. IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC Classification Group 1.

The product contains other ingredients which do not contribute to the overall classification.

4. First aid measures

4.1 First Aid.

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact Wash skin thoroughly with soap and water. Get medical attention if irritation persists.
Eye contact Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed.

General advice The severity of the symptoms described will vary dependent of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed.

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media.

Suitable extinguishing media
Use extinguishing media appropriate for surrounding material.

Extinguishing media which must not be used for safety reasons
Do not use water jet.

5.2 Special hazards arising from the substance or mixture.

Unusual fire and explosion hazards
None known.

Hazardous combustion products

Thermal decomposition can lead to release of irritating gases and vapours

Engineering measures to reduce exposure

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection Tightly fitting safety goggles. Safety glasses with side-shields.
Hand protection Wear gloves according to EN 374 to protect against skin effects from powders
Respiratory protection Use protective gloves made of: Neoprene Nitrile
Frequent change is advisable
In case of insufficient ventilation wear suitable respiratory equipment. Suitable mask with particle filter P3 (European Norm 143). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.
Skin and body protection Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.



9. Physical and chemical properties

9.1 Information on basic physical and chemical properties.

Physical state Solid
Appearance Powder
Colour Offwhite
Odour Cream - Grey
Odour threshold Not applicable

9.2 Information on specific physical and chemical properties.

Property	Values	Remarks
pH @ dilution	No information available	
Melting / freezing point	> 450 °C / 842 °F	
Boiling point/range	No information available	
Flash point	No information available	
Evaporation rate	Not applicable	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air	Not applicable	
Upper flammability limit	Not applicable	
Lower flammability limit	Not applicable	
Vapour pressure	No information available	
Vapour density	No information available	
Specific gravity	2.3 - 2.6	20 °C
Bulk density	750 - 950 kg/m ³	
Relative density	No information available	
Water solubility	Negligible	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	> 500 °C / 932°F	

Kinematic viscosity Not applicable
Dynamic viscosity Not applicable
log Pow No information available
Explosive properties Not applicable
Oxidising properties None known
9.2 Other information
Pour point No information available
Molecular weight No information available
VOC content(%) None
Density No information available

10. Stability and reactivity

10.1 Reactivity.

No specific reactivity hazards associated with this product.

10.2 Chemical stability.

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions.

Hazardous polymerisation
Hazardous polymerisation does not occur.

10.4 Conditions to avoid.

Avoid wet and humid conditions. Avoid dust formation.

10.5 Incompatible materials.

No materials to be especially mentioned.

10.6 Hazardous decomposition products.

See Section 5.

11. Toxicological information

11.1 Information on toxicological effects.

Acute toxicity

Product information This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis.

Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact Dust may cause mechanical irritation.

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2. Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

Methods for Containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4. Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1. Preparations for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions

Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture

Storage class

Chemical storage.

Packaging material

Use specially constructed containers only

7.3. Specific end uses

See also Section 1.2.

8. Exposure controls/personal protection

8.1. Control parameters

Component	EU OEL - Third List	Austria	Australia	Denmark
Crystalline silica (impurity)	Not determined	Not determined	0.1 mg/m ³ TWA	0.1 mg/m ³

Component	Malaysia	France	Germany	Hungary
Crystalline silica (impurity)	0.1 mg/m ³ TWA	0.1 mg/m ³	Not determined	Not determined

Component	No Zealand	Norway	Netherlands	Norway
Crystalline silica (impurity)	0.2 mg/m ³ TWA Not in powdered human carcinogen	Not determined	0.075 mg/m ³	0.3 mg/m ³ TWA total dust 0.1 mg/m ³ TWA respirable dust 0.9 mg/m ³ STEL total dust 0.3 mg/m ³ STEL respirable dust Carcinogen

Component	Poland	Portugal	Romania	Russia
Crystalline silica (impurity)	2 mg/m ³ TWA >50% free crystalline silica total inhalable dust 0.3 mg/m ³ TWA >50% free crystalline silica respirable dust 4.0 mg/m ³ TWA 2% to 50% free crystalline silica total inhalable dust 1.0 mg/m ³ TWA 2% to 50% free crystalline silica respirable dust	0.025 mg/m ³ TWA respirable fraction	Not determined	1 mg/m ³ MMD 1 mg/m ³ STEL Fibrogenic substance

Component	Spain	Switzerland	Turkey	UK
Crystalline silica (impurity)	0.1 mg/m ³ TWA-EQ respirable fraction	0.15 mg/m ³ MMD respirable	Not determined	0.3 mg/m ³ STEL calculated respirable 0.1 mg/m ³ TWA respirable

11.1. Information on toxicological effects

Acute toxicity

Inhalation

Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact

Dust may cause mechanical irritation.

Skin contact

Prolonged contact may cause redness and irritation.

Ingestion

Ingestion may cause stomach discomfort.

Unknown acute toxicity

Not Applicable.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Crystalline silica (impurity)	~ 500 mg/kg (Rat)	No data available	No data available

Sensitisation

This product does not contain any components suspected to be sensitizing.

Mutagenic effects

This product does not contain any known or suspected mutagens.

Carcinogenicity

Crystalline silica dust is listed by IARC in Group 1 as known to cause lung cancer in humans, if inhaled.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Routes of exposure

Inhalation.

Routes of entry

Inhalation.

Specific target organ toxicity (single exposure)

Not classified.

Specific target organ toxicity (repeated exposure)

Not classified.

Aspiration hazard

No hazard from product as supplied.

12. Ecological information

12.1. Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Listed on P-List or list of OSPAR

Toxicity to algae

This product is not considered toxic to algae.

Toxicity to fish

This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates

This product is not considered toxic to invertebrates.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Crystalline silica (impurity)	No information available	No information available	No information available

12.2. Persistence and degradability

Not Applicable - Inorganic chemical.

12.3. Bioaccumulative potential

Not Applicable - Inorganic chemical.

12.4. Mobility in soil

Mobility

Insoluble in water.

12.5. Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

13. Disposal considerations

8.2. Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection

It is good practice to wear Safety Glasses with Side-shields when handling any chemical.

Hand protection

Repeated or prolonged contact. Use protective gloves made of: Nitrile, Neoprene.

Respiratory protection

Frequent change is advisable.

In case of insufficient ventilation wear suitable respiratory equipment. Suitable mask with particle filter P3 (European Norm 143). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

Skin and body protection

Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.



9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Solid

Appearance Powder Dust

Colour Colourless

Colour White

Odour threshold Not applicable

Properties Not applicable

pH 8.0 - 10.0

Melting/freezing point > 700 °C / > 1292 °F

Boiling point/tripoint No information available

Flash Point No information available

Evaporation rate No information available

Remarks

< 10%

Flammability (solid, gas) Not Applicable

Flammability Limits in Air Not applicable

Upper flammability limit Not applicable

Lower flammability limit No information available

Vapor pressure No information available

Specific gravity 2.7 - 2.8

Bulk density No information available

Relative density No information available

Water solubility Insoluble in water

Solubility in other solvents No information available

Autoignition temperature No information available

Decomposition temperature No information available

Rheumatic viscosity No information available

Viscosity, dynamic Not determined

Log Pow Not determined

Explosive properties Not Applicable

Oxidizing properties None known.

9.2. Other information

Pour point No information available

Molecular weight None

VOC content(%) No information available

Density VALUE No information available

10. Stability and reactivity

10.1. Reactivity

No specific reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of Hazardous Reactions

Hazardous polymerization Hazardous polymerization does not occur.

10.4. Conditions to avoid None

Protect from moisture No information available

10.5. Incompatible materials No information available

No materials to be especially mentioned.

10.6. Hazardous decomposition products No information available

See also section 5.2.

11. Toxicological information

13.1. Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWG waste disposal No. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWG waste disposal No: 06 03 99.

14. Transport information

14.1. UN number

Not registered

14.2. Proper shipping name The product is not covered by international regulation on the transport of dangerous goods

14.3. Hazard classification Not regulated

ADR/RID/ADNAGD Hazard class Not regulated

IMDG Hazard class Not regulated

ICAO Packing group Not regulated

ADR/RID/ADNAGD Packing Group Not regulated

IMDG Packing group Not regulated

ICAO Packing group Not regulated

14.4. Environmental hazard No

14.5. Special precautions Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Please contact MSD@sb.com for info regarding transport in Bulk.

15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Germany, Water Endangering Water endangering class = nwg

Classes (v/w/vs)

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/04 as well as Council Directive 76/769/EEC and Commission Directives 91/156/EEC, 93/105/EEC and 2000/21/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

International Inventories

USA, Toxic Substances Control Act Inventory (TSCA)

European Union - EINECS and ELINCS

Canada, Domestic Substance List (DSL)

Philippines (PICCS)

Inventory - Japan - Existing and New Chemicals list

China (IECSC)

Australia (ANCS)

Korea (KECL)

Inventory - New Zealand - Inventory of Chemicals (NZoC)

Contact REACH@mswaco.slb.com for REACH information.

15.2. Chemical Safety Report

No information available

16. Other information

Prepared by Global Regulatory Compliance - Chemicals (GRC - Chemicals) - Anne Karin (Anka) Fosse

Supersedes date 09/Apr/2014

Revision date 25/Jan/2015

Version 7

The following sections have been revised All sections. No changes with regard to classification have been made. Updated according to GHS/CLP.

Full text of H-Statements referred to under sections 2 and 3

This product is not classified as hazardous therefore no (H) hazard statements assigned.

9.2 Other Information
Pour point
Molecular weight
VOC content(%)
Density

4°C / 40°F
No information available
None
No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerisation
Hazardous polymerisation does not occur.

10.4 Conditions to avoid

None known.

10.5 Incompatible materials

Strong oxidising agents.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation

Inhalation of vapours in high concentration may cause irritation of respiratory system.

Eye contact

Causes serious eye damage.

Skin contact

Causes skin irritation.

Ingestion

Ingestion may cause stomach discomfort.

Unknown acute toxicity

Not applicable.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Fatty acids, C18-unsaturated, dimers, polymers with dithiolenes and dithioleneoxides	No data available	No data available	No data available
Trimethylolpropane dimethylol ether	> 5000 mg/kg (Rat)	> 3000 mg/kg (Rabbit)	No data available
Unsubstantiated exposure	> 5000 mg/kg (Rat)	> 3000 mg/kg (Rabbit)	No data available

Sensitisation

This product does not contain any components suspected to be sensitizing.

Mutagenic effects

This product does not contain any known or suspected mutagens.

Carcinogenicity

This product does not contain any known or suspected carcinogens.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Routes of exposure

Eyes, Skin contact.

Routes of entry

No route of entry noted.

Specific target organ toxicity (single exposure)

Not classified.

Specific target organ toxicity (repeated exposure)

Not classified.

Aspiration hazard

Not applicable.

12. Ecological information

12.1 Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Fatty acids, C18-unsaturated, dimers, polymers with dithiolenes and	No information available	No information available	No information available

2000/2/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)], National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition], National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1903 (1998)].

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Not classified as dangerous goods in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG).

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 [P.U.(A) 310/2013] (CLASS Regulations)

The Industry Code of Practice on Chemical Classification and Hazard Communication 2014 [P.U. (B) 128/2014] (ICOP)

International Inventories

USA, Toxic Substances Control Act Inventory (TSCA)

Compiles

European Union - EINECS and ELINCS

Compiles

Canada (DSL)

Compiles

Philippines (PICCS)

Compiles

Inventory - Japan - Existing and New Chemicals list

Does not Comply

China (IECSC)

Compiles

Australia (ACQ9)

Compiles

Korea (KECL)

Compiles

Inventory - New Zealand - Inventory of Chemicals (NZIoC)

Compiles

CAS Number 68410-22-0 can be used to identify the substance mentioned in Section 3 for the International Inventories.

15.2 Chemical Safety Report

No information available

16. Other information

Prepared by

Global Regulatory Compliance - Chemicals (GRC - Chemicals) - Anne Karin (Anka) Fosse

Supersedes date

23/Jul/2014

Revision date

13/Feb/2017

Version

5

This SDS has been revised in the following section(s)

All sections Product code change No changes with regard to classification have been made.

Text of R phrases mentioned in Section 3
R36 - Irritating to eyes
R38 - Irritating to skin
R41 - Risk of serious damage to eyes

Full text of H-Statements referred to under sections 2 and 3

H315 - Causes skin irritation
H318 - Causes serious eye damage

H319 - Causes serious eye irritation

*A mark of M-I L.L.C., a Schlumberger Company

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

dithiolenes	> 3000 mg/L LC50 (Finnish rats) pneumal (6 h, 2200 - 4600 mg/L) LC50 (average data 96 h)	> 500 mg/L EC50 (Daphnia magna) subacute 72 h	> 300 mg/L EC50 (Daphnia magna) 48 h
Propylene carbonate	> 5000 mg/L LC50 (Lacisella kila) 96 h > 1000 mg/L LC50 (Oryzias carpio 96 h)	> 500 mg/L EC50 (Daphnia magna) subacute 72 h	> 100 mg/L EC50 (Daphnia magna) 48 h

12.2 Persistence and degradability

Not readily biodegradable.

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

Insoluble in water.

12.6 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products

Dispose of in accordance with local regulations.

Contaminated packaging

Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWaste Disposal

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWaste waste disposal No. 07 01 04 Waste Code: 7102 Organic waste without halogens.

14. Transport information

14.1 UN number

Not regulated

14.2 UN proper shipping name

The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

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ADR/RID/ADN/ADG Hazard class

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ADR/RID/ADN/ADG Hazard class

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ADR/RID/ADN/ADG Hazard class

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Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

ADR/RID/ADN/ADG Hazard class

Not regulated

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No poisons schedule number allocated

New Zealand hazard classification

Classified

HSND approval no.

HSND02503

Group number

6.3A, 8.3A

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/61/EEC and

Safety Data Sheet
Potassium Chloride M117

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name

Potassium Chloride M117

Product code

M117

Denmark Pr. no.

1008953

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended use

Clay control agent in oilfield applications

Uses advised against

Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier identification

Schlumberger Oilfield UK PLC

Victory House, Churchill Court

Marine Royal, Crawley

West Sussex RH10 5LU

+47 51577424

SDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 595 3518

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards

Not classified

Environmental hazards

Not classified

Physical hazards

General advice	The severity of the symptoms described will vary dependent of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.
Main symptoms	
Inhalation	Please see Section 11. Toxicological information for further information.
Ingestion	Please see Section 11. Toxicological information for further information.
Skin contact	Please see Section 11. Toxicological information for further information.
Eye contact	Please see Section 11. Toxicological information for further information.
6.3. Indication of any immediate medical attention and special treatment needed.	
Notes to physician	Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media.
Suitable extinguishing media
Use extinguishing media appropriate for surrounding material.
Extinguishing media which shall not be used for safety reasons
None known.

5.2. Special hazards arising from the substance or mixture.

Unusual fire and explosion hazards
None known.
Hazardous combustion products
Heating or fire can release toxic gas. Hydrogen chloride gas.
5.3. Advice for firefighters.
Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.
Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures.
Use personal protective equipment. See also section 8. Avoid breathing dust; if exposed to high dust concentration, leave area immediately.
6.2. Environmental precautions.
The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.
6.3. Methods and materials for containment and cleaning up.
Methods for Containment
Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading.
Methods for cleaning up
Avoid generating or breathing dust. Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.
6.4. Reference to other sections.
See section 13 for more information.

7. Handling and storage

7.1. Precautions for safe handling.
Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid handling causing generation of dust. Do not breathe dust. Avoid contact with skin and eyes.
Hygiene measures
Use good work and personal hygiene practices to avoid exposure. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing. Do not eat, drink or smoke when using this product.
7.2. Conditions for safe storage, including any incompatibilities.
Technical measures/precautions
Ensure adequate ventilation. Provide appropriate exhaust ventilation at places where dust is formed.
Storage
Keep containers tightly closed in a dry, cool and well-ventilated place.
Substances which, in contact with water, emit flammable gases
Chemical storage.
Packaging material
Use specially constructed containers only.
7.3. Specific end uses.
See also Section 1.2.

8. Exposure controls/personal protection

8.1. Control parameters.
Exposure limits
NLI = Nuisance dust, TWA 4mg/m ³ Respirable Dust, 10mg/m ³ Total Dust.

No materials to be especially mentioned.

10.6. Hazardous decomposition products.

See also section 5.2.

11. Toxicological information

11.1. Information on toxicological effects.
Acute toxicity
Inhalation of dust in high concentration may cause irritation of respiratory system.
Inhalation
May cause slight irritation.
Eye contact
Prolonged contact may cause redness and irritation.
Skin contact
Ingestion may cause stomach discomfort.
Ingestion
Not Applicable.
Unknown acute toxicity

Sensitisation
This product does not contain any components suspected to be sensitizing.
Mutagenic effects
This product does not contain any known or suspected mutagens.
Carcinogenicity
This product does not contain any known or suspected carcinogens.

Reproductive toxicity
This product does not contain any known or suspected reproductive hazards.
Routes of exposure
Inhalation. Eye contact. Skin contact.
Routes of entry
No route of entry noted.
Specific target organ toxicity (single exposure)
Not classified.
Specific target organ toxicity (repeated exposure)
Not classified.
Aspiration hazard
No hazard from product as supplied.

12. Ecological information

12.1. Toxicity.
The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Toxicity to algae
This product is not considered toxic to algae.
Toxicity to fish
This product is not considered toxic to fish.
Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

12.2. Persistence and degradability.

No product level data available.

12.3. Bioaccumulative potential.

No product level data available.

12.4. Mobility in soil.

The product is water soluble, and may spread in water systems.

12.5. Results of PBT and vPvB assessment.

Not classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects.

None known.

13. Disposal considerations

13.1. Waste treatment methods.
Waste from residues / unused products
Dispose of in accordance with local regulations.

8.2. Exposure controls.
All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment
Eye protection
It is good practice to wear goggles when handling any chemical. Safety glasses with side-shields.
Hand protection
Repeated or prolonged contact; Use protective gloves made of: Neoprene, Nitrile, Rubber, PVC. Frequent change is advisable.
Respiratory protection
No protective equipment is needed under normal use conditions. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (spill). Effective dust mask, Type P2. At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.
Wear appropriate personal protective clothing to prevent skin contact. Eye wash and emergency shower must be available at the work place.
Skin and body protection

Hygiene measures
Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use.

**9. Physical and chemical properties**

9.1. Information on basic physical and chemical properties.
Physical state
Solid
Appearance
Crystalline
Odour
very faint

Colour
White
Odor threshold
Not applicable
Property.
Values.
Remarks.
pH
8-10
② 25°C Aqueous soln
pH @ dilution
770 °C / 1418 °F
Melting/freezing point
Not Applicable
Boiling point/range
Not applicable
Flash Point
Evaporation rate
Not Applicable
Flammability (solid, gas)
Flammability Limits in Air
Not applicable
Upper flammability limit
Not applicable
Lower flammability limit
Not applicable
Vapor pressure
No information available
Vapor density
No information available
Specific gravity
1.100 kg/m ³
Bulk density
1.989 g/cm ³
Relative density
300 g/l
Water solubility
No information available
Solubility in other solvents
No information available
Autoignition temperature
No information available
Decomposition temperature
No information available
Kinematic viscosity
Viscosity, dynamic
No information available
Log Pow
Not determined
Explosive properties
Oxidizing properties
Not Applicable
None known.
9.2. Other information.
Pour point
No information available
Molecular weight
None
VOC content(%)
None
Density VALUE
No information available

10. Stability and reactivity

10.1. Reactivity.
No specific reactivity hazards associated with this product.
10.2. Chemical stability.
Stable under normal temperature conditions and recommended use.

10.3. Possibility of Hazardous Reactions.

Hazardous polymerization

Hazardous polymerisation does not occur.

10.4. Conditions to avoid.

Avoid dust formation.

10.5. Incompatible materials.

Contaminated packaging
Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.
EWG waste disposal No.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWG waste disposal No: 06 03 14

14. Transport information

The product is not covered by international regulation on the transport of dangerous goods (MDG, IATA/ADRI/ADIADG).

14.1. UN number.
Not regulated
14.2. Proper shipping name.
Not regulated
14.3. Hazard class(es).
ADRI/ADIADN Hazard class
MDG Hazard class
ICAO Hazard class/division
Not regulated
Not regulated
14.4. Packing group.
ADRI/ADIADN Packing Group
MDG Packing group
ICAO Packing group
Not regulated
Not regulated
Not regulated
14.5. Environmental hazard
No

14.6. Special precautions.
Not Applicable
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Please contact SDS@stb.com for info regarding transport in Bulk.

15. Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.**

Germany, Water Endangering Classes (VwVwG)
Hazardous to water/Class 1

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1489/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/105/EEC and 2000/60/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

International inventories

USA, Toxic Substances Control Act Inventory (TSCA)
European Union - EINECS and ELINCS
Canada, Domestic Substance List (DSL)
Philippines (PICCS)
Inventory - Japan - Existing and New Chemicals list
China (IECCL)
Australia (AICS)
Korea (KECL)
Inventory - New Zealand - Inventory of Chemicals (NZCoC)

15.2. Chemical Safety Report.

No information available

16. Other information

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals), Nicola Anderson
Supersedes date
16/Aug/2010
Revision date
14/May/2015
Version
3
The following sections have been revised
Updated according to GHGCLP.

Text of R phrases mentioned in Section 3

Not classified

Full text of H-Statements referred to under sections 2 and 3

This product is not classified as hazardous therefore no (H) hazard statements assigned.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty, or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

Safety Data Sheet
VERSATROL™ M

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier.

Product name VERSATROL™ M
Product code PID15065
REACH Registration Name
Denmark Pr. no. 2030374

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Recommended Use Fluid loss reducer.

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet.

Supplier

Mi Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill, AB32 6TD
Scotland UK
+47 51977424

MSDS@slb.com

1.4 Emergency Telephone Number.

Emergency telephone : (24 Hour) Australia +61 2801 44658, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9029 1480, USA 901 281 261 1600

Denmark +45 99 22 2506
Norway +47 22 59 13 00
Poison Control Hotline (UK) +45 82 12 12 12
Poison information centre: +47 22 59 13 00

2. Hazards Identification

2.1 Classification of the substance or mixture.

Classification according to Regulation (EC) No. 1272/2008 (CLP)

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards Not classified

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions.

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up.

Methods for containment

Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimise spreading.

Methods for cleaning up

Sweep up and should into suitable containers for disposal. Take precautionary measures against static discharges. After cleaning, flush away traces with water.

6.4 Reference to other sections.

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. Remove all sources of ignition. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. When using do not eat, drink, smoke, sniff. Wash hands and face before and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities.

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions

Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid heat, flames and other sources of ignition. Avoid contact with: Strong oxidising agents.

Storage class

Chemical storage.

Packaging materials

Use specially constructed containers only.

7.3 Specific end uses.

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters.

Exposure Limits NIU = Nuisance dust, TWA 4mg/m³ Respirable Dust, 10mg/m³ Total Dust.
No biological limit allocated

8.2 Exposure controls.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection

Use eye protection according to EN 166, designed to protect against powders and dusts. Tightly fitting safety goggles. Safety glasses with side-shields.

Hand protection

Wear gloves according to EN 374 to protect against skin effects from powders. Repeated or prolonged contact. Use protective gloves made of: Neoprene Nitrile. Frequent change is advisable.

Respiratory protection

No personal respiratory protective equipment normally required. In case of insufficient ventilation wear suitable respiratory equipment. Half mask with a particle filter P2 (BS EN 143). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

Skin and body protection

Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.

8.2.1 Environmental exposure controls.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties.

Physical state Solid
Appearance Powder Dust
Odour Odourless
Colour Black
Odour threshold Not applicable

2.2 Label elements

Signal word

None

Hazard statements

This product is not classified as hazardous therefore no (H) hazard statements assigned.

Precautionary Statements - EU (626, 1272/2008)

This product is not classified as hazardous therefore has no (P) precautionary statements assigned.

-

Contains

2.3 Other hazards

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHS/C.

NON-HAZARDOUS SUBSTANCE, NON-DAINGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances.

This product does not contain any hazardous ingredients, or ingredients with national workplace exposure limits.

3.2 Mixtures.

Not applicable

4. First aid measures

4.1 First Aid.

Inhalation

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion

Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Skin contact

Wash skin thoroughly with soap and water. Get medical attention if irritation persists.

Eye contact

Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Get

medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed.

General advice

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed.

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media.

Suitable extinguishing media Use extinguishing agent suitable for type of surrounding fire.

Extinguishing media which must not be used for safety reasons None known.

5.2 Special hazards arising from the substance or mixture.

Unusual fire and explosion hazards

Dust may form explosive mixture in air.

Hazardous combustion products

Fire or high temperatures create: Carbon oxides (COx), Nitrogen oxides (NOx).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures.

Property	Values	Remarks
pH	No information available	
pH @ dilution		
Melting / freezing point	140 - 205 °C / 284-401 °F	
Boiling point/range	No information available	
Flash point	316 °C / 600 °F	Cleveland Open Cup (COC)
Evaporation rate	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		
Upper flammability limit	200-500 g/m ³	
Lower flammability limit	Not applicable	
Vapour pressure	No information available	
Vapour density	No information available	
Specific gravity	1.04 - 1.06	20 °C
Bulk density	540 kg/m ³ / ~34 lb/ft ³	
Water solubility	No information available	
Solubility in other solvents	Insoluble in water	
Autoignition temperature	No information available	
Decomposition temperature	500 °C / 932 °F	
Kinematic viscosity	288 °C / 550 °F	
Dynamic viscosity	No information available	
log Pow	No information available	
Explosive properties	Suspended dust may present a dust explosion hazard	
Oxidising properties	None known	
Other information		
Pour point	No information available	
Molecular weight	None	
VOC content(%)	No information available	
Density	185-204°C / 365-400°F	
Softening point		

10. Stability and reactivity

10.1 Reactivity.

Dust may form explosive mixture in air.

10.2 Chemical stability.

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions.

Hazardous polymerisation

Hazardous polymerisation does not occur.

10.4 Conditions to avoid.

Avoid heat, flames and other sources of ignition. Avoid dust formation.

10.5 Incompatible materials.

Strong oxidising agents.

10.6 Hazardous decomposition products.

See Section 5.2.

11. Toxicological information

11.1 Information on toxicological effects.

Acute toxicity

Inhalation

Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact

Dust may cause mechanical irritation.

Skin contact

Prolonged contact may cause redness and irritation.

Ingestion

Ingestion may cause stomach discomfort.

Unknown acute toxicity

Not applicable.

Sensitization

This product does not contain any components suspected to be sensitizing.

Mutagenic effects

This product does not contain any known or suspected mutagens.

Carcinogenicity

This product does not contain any known or suspected carcinogens.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Routes of exposure

Inhalation.

Routes of entry

Inhalation.

Specific target organ toxicity - Single exposure

Not classified

Specific target organ toxicity - Repeated exposure

Not classified.

Aspiration hazard

Not applicable.

12. Ecological information

12.1. Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae

This product is not considered toxic to algae.

Toxicity to fish

This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates

This product is not considered toxic to invertebrates.

12.2. Persistence and degradability

The product is not biodegradable.

12.3. Bioaccumulative potential

Does not bioaccumulate.

12.4. Mobility in soil

Insoluble in water.

12.5. Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

13. Disposal considerations

13.1. Waste treatment methods

Waste from residues / unused products

Dispose of in accordance with local regulations.

Contaminated packaging

Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWG Waste Disposal No

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWG waste disposal No: 07 01 99.

14. Transport information

14.1. UN number

Not regulated

14.2. UN proper shipping name

The product is not covered by international regulation on the transport of dangerous goods

14.3. Hazard classes

ADR/RID/ADN/ADO Hazard class

Not regulated

MDG Hazard class

Not regulated

ICAO Hazard classification

Not regulated

14.4. Packing group

ADR/RID/ADN/ADO Packing group

Not regulated

MDG Packing group

Not regulated

ICAO Packing group

Not regulated

14.5. Environmental hazard

No

14.6. Special precautions

Not applicable

14.7. Transport in bulk according to Annex III of MARPOL 72/78 and the IBC Code

Please contact MSDS@sib.com for info regarding transport in bulk.

15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Germany, Water Endangering Classes (vPvB)
Water endangering class = nsg

Australian Standard for the Uniform Scheduling of Drugs and Poisons

Safety Data Sheet VG-PLUS™

1. Identification of the substance/preparation and of the Company/undertaking

1.1. Product identifier

Product name VG-PLUS™
Product code M10459
REACH Registration Number Exempt
Denmark Pn, no. 1762523

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use Viscosifier.

Uses advised against Consumer use

1.3. Details of the supplier of the safety data sheet

Supplier

M4 Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill Industrial Estate
Westhill, AB32 8TG
Scotland UK
+47 51377424

MSDS@sib.com

1.4. Emergency Telephone Number

Emergency telephone : (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3030, Europe +44 (0) 1235 239 870, Middle East and Africa +44 (0) 1235 239 871, New Zealand +64 9029 1483, USA 001 281 581 1800

2. Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards Not classified

Environmental hazards Not classified

Physical hazards Not classified

2.2. Label Elements

Signal word

None

Hazard statements

This product is not classified as hazardous therefore no (H) hazard statements assigned.

Precautionary Statements - EU (428, 1272/2008)

This product is not classified as hazardous therefore has no (P) precautionary statements assigned.

•

Classification according to EU Directives 67/540/EEC or 1999/45/EC

Indication of danger

Not classified

Contents

Crystalline silica (impurity)

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

2.3. Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NONSC:
NON-HAZARDOUS SUBSTANCE, NON-DAINGEROUS GOODS.

3. Composition/information on ingredients

3.1. Substances

Component	EC-No.	CAS-No.	Weight % range	Classification (67/548)	Classification (Reg. 1272/2008)	REACH registration number
Crystalline silica (impurity)	238-878-4	14838-62-7	< 1	Xn; H420	STOT Rep. 2 - H073	Exempt

3.2. Mixtures

Not Applicable

Comments

This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis. IARC Monographs, Vol. 68, 1987, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC Classification Group 1.

The product contains other ingredients which do not contribute to the overall classification.

4. First aid measures

No poisons schedule number allocated

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1980/EEC and repealing Council Regulation (EEC) No 79/353 and Commission Regulation (EC) No 1488/84 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EEC and 2002/15/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition (NOHSC: 2011 (2003)).

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances (NOHSC:1008 (2004) 3rd Edition).

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment (NOHSC:1003 (1990)).

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Not classified as dangerous goods in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG).

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 (P.U.(A) 310/2013) (CLASS Regulations)

The Industry Code of Practice on Chemical Classification and Hazard Communication 2014 (P.U. (B) 128/2014) (ICOP) International Inventories.

USA: Toxic Substances Control Act inventory (TSCA)
European Union - EINECS and ELINCS
Canada (DSL)
Philippines (PICCS)
Inventory - Japan - Existing and New Chemicals list
China (REACH)
Australia (AICS)
Korea (KECL)
Inventory - New Zealand - Inventory of Chemicals (NZIoC)

Complies
Complies
Complies
Complies
Complies
Complies
Complies
Complies

15.2. Chemical Safety Report

No information available

16. Other information

Prepared by Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Anne Karin (Anka) Fosse

Supersedes date 14/Jul/2014

Revision date 11/May/2017

Version 4

This SDS has been revised in the following section(s)

All sections No changes with regard to classification have been made.

Full text of H-Statements referred to under sections 2 and 3

This product is not classified as hazardous therefore no (H) hazard statements assigned.

*A mark of M-I L.L.C., a Schlumberger Company

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product, merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

4.1. First Aid

Inhalation

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion

Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Skin contact

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact

Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General advice

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation

Please see Section 11. Toxicological Information for further information.

Ingestion

Please see Section 11. Toxicological Information for further information.

Skin contact

Please see Section 11. Toxicological Information for further information.

Eye contact

Please see Section 11. Toxicological Information for further information.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to physician

Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media

Use extinguishing media appropriate for surrounding material.

Extinguishing media which shall not be used for safety reasons

Do not use water jet.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Dust may form explosive mixture in air.

Hazardous combustion products

Thermal decomposition can lead to release of irritating gases and vapours.

5.3. Advice for firefighters

Special protective equipment for fire-fighters

As in dry fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2. Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

Methods for Containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4. Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1. Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. Remove all sources of ignition. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition

Storage class

Chemical storage.

Packaging material

Use specially constructed containers only

7.3. Specific end uses.
See Section 1.2.

8. Exposure controls/personal protection

8.1. Control parameters

Exposure limits No biological limit allocated

Component	EU OEL - Third List	Austria	Australia	Denmark
Crystalline silica (impurity)	Not determined	0.15 mg/m ³ TWA (all other dust, respirable fraction)	0.1 mg/m ³ TWA (respirable dust)	0.1 mg/m ³
Component	Malaysia	France	Germany	Hungary
Crystalline silica (impurity)	0.1 mg/m ³ TWA	0.1 mg/m ³ TWA	Not determined	0.3 mg/m ³ TWA
Component	New Zealand	Italy	Netherlands	Norway
Crystalline silica (impurity)	0.2 mg/m ³ TWA (known or presumed human carcinogen)	Not determined	0.075 mg/m ³	0.3 mg/m ³ TWA total dust 0.1 mg/m ³ TWA respirable dust 0.3 mg/m ³ STEL total dust 0.1 mg/m ³ STEL respirable dust Carcinogen
Component	Poland	Portugal	Romania	Slovakia
Crystalline silica (impurity)	2 mg/m ³ TWA NDS >50% free crystalline silica 0.3 mg/m ³ TWA NDS >50% free crystalline silica 4.0 mg/m ³ TWA NDS 2% to 50% free crystalline silica 1.0 mg/m ³ TWA NDS 2% to 50% free crystalline silica	0.05 mg/m ³ TWA respirable fraction	0.1 mg/m ³ TWA (respirable fraction, dust)	3 mg/m ³ STEL 1 mg/m ³ STEL, aerosol 1 mg/m ³ TWA 3 mg/m ³ STEL, aerosol 1 mg/m ³ TWA, aerosol Flammable substance and self-heating substance dust 2-10% and 10-70% (respirable dust) silicon dioxide, crystalline silicon dioxide
Component	Spain	Switzerland	Turkey	UK
Crystalline silica (impurity)	0.05 mg/m ³ TWA VLA-EEC	0.15 mg/m ³ TWA MAK	Not determined	0.3 mg/m ³ STEL, calculated respirable 0.1 mg/m ³ TWA, respirable

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8.2. Exposure controls.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.
Hand protection Repeated or prolonged contact. Use protective gloves made of: Neoprene, Nitrile.
Respiratory protection Repeated or prolonged contact. Use suitable mask with particle filter P3 (European Norm 143).
Skin and body protection Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.



9. Physical and chemical properties

9.1. Information on basic physical and chemical properties.

Physical state	Solid
Appearance	Powder Dust
Odour	Odourless
Colour	off-white
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	No information available	
pH @ dilution		
Melting/freezing point	No information available	

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12. Ecological information

12.1. Toxicity.
The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
This product is not considered toxic to algae.

Toxicity to fish
This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Crystalline silica (impurity)	No information available	No information available	No information available

12.2. Persistence and degradability.

Not readily biodegradable.

12.3. Bioaccumulative potential.

Does not bioaccumulate.

12.4. Mobility in soil.

Immobilised in water.

12.5. Results of PBT and vPvB assessment.

Not classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects.

None known.

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13. Disposal considerations

13.1. Waste treatment methods.

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWG waste disposal No. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWG waste disposal No: 01 05 99

14. Transport information

14.1. UN number.

Not regulated

14.2. Proper shipping name.

The product is not covered by international regulation on the transport of dangerous goods

14.3. Hazard classification

ADR/RID/ADNADO Hazard class Not regulated

IMDG Hazard class Not regulated

ICAO Hazard classification Not regulated

14.4. Packing group

ADR/RID/ADNADO Packing Group Not regulated

IMDG Packing group Not regulated

ICAO Packing group Not regulated

14.5. Environmental hazard.

Not Applicable

14.6. Special precautions.

Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Please contact MISCOS@sb.com for info regarding transport in bulk.

15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

Germany, Water Endangering Classes (VwVwS) Water endangering class = 1

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Boiling point/range	No information available
Flash Point	No information available
Evaporation rate	No information available
Flammability (solid, gas)	Not Applicable
Flammability Limits in Air	Not applicable
Upper flammability limit	>= 0.05 g/l
Lower flammability limit	No information available
Vapor pressure	No information available
Vapor density	1.4 - 1.8 g/l
Specific gravity	20 °C
Bulk density	828 kg/m ³ (33 lb/ft ³)
Relative density	No information available
Water solubility	Insoluble in water
Solubility in other solvents	No information available
Autoignition temperature	190 °C / 374 °F
Decomposition temperature	200
Kinematic viscosity	No information available
Viscosity, dynamic	No information available
Log Pow	No information available
Explosive properties	No information available
Oxidizing properties	No information available

9.2. Other information.

Pour point No information available

Molecular weight No information available

VOC content(s) No information available

Density VALUE No information available

10. Stability and reactivity

10.1. Reactivity.

No specific reactivity hazards associated with this product.

10.2. Chemical stability.

Stable under normal temperature conditions and recommended use.

10.3. Possibility of Hazardous Reactions.

Hazardous polymerization Hazardous polymerization does not occur.

10.4. Conditions to avoid.

Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials.

No materials to be especially mentioned.

10.6. Hazardous decomposition products.

See also section 5.2.

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11. Toxicological information

11.1. Information on toxicological effects.

Acute toxicity

Product information This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis.

Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact May cause slight irritation.

Skin contact Prolonged contact may cause redness and irritation.

Ingestion Ingestion may cause stomach discomfort.

Unknown acute toxicity Not Applicable.

Component	LD50 Oral	LD50 Dermal	LD50 Inhalation
Crystalline silica (impurity)	= 600 mg/kg (1 Rat)	No data available	No data available

Sensitisation

This product does not contain any components suspected to be sensitising.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity Crystalline silica dust is listed by IARC in Group 1 as known to cause lung cancer in humans, if inhaled.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Routes of exposure Inhalation, Ingestion.

Routes of entry Inhalation, Ingestion.

Specific target organ toxicity (single exposure) Not classified.

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard No hazard from product as supplied.

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Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated

New Zealand hazard classification Not classified.

HSNO approval no. Not required.

Group number Not required.

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/46/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1486/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/105/EEC and 2005/18/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition (NOHSC: 2011 (2003)).

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances (NOHSC:1068 (2004) 3rd Edition).

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment (NOHSC:1003 (1995)).

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 [P.U.(A) 119/2013] (CLASS Regulations)

The Industry Code of Practice on Chemical Classification and Hazard Communication 2014 [P.U. (B) 128/2014] (ICOP) International inventories

USA, Toxic Substances Control Act Inventory (TSCA)

European Union - EINECS and ELINCS

Canada, Domestic Substance List (DSL)

Philippines (PICCS)

Inventory - Japan - Existing and New Chemicals list

China (ECCC)

Australia (AICS)

Korea (KICCL)

Inventory - New Zealand - Inventory of Chemicals (NZIoC)

Complex

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Contact REACH@miswaco.slb.com for REACH information.

15.2. Chemical Safety Report.

No information available

16. Other information

Prepared by Global Regulatory Compliance - Chemicals (GRC - Chemicals), Anne Katt (Anka) Fosse

Supersedes date 20/Nov/2014

Revision date 04/Dec/2014

Version 7

The following sections have been revised: 3. Composition/Information on Ingredients, 13. Disposal considerations, Section 16: Other information.

Text of R phrases mentioned in Section 3

R4502 - Harmful: danger of serious damage to health by prolonged exposure through inhalation

Full text of H-Statements referred to under sections 2 and 3

This product is not classified as hazardous therefore no (H) hazard statements assigned.

H373 - May cause damage to organs through prolonged or repeated exposure if inhaled

*A mark of M-I L.L.C.

Disclaimer: The information contained herein is considered in good faith as reliable of the data issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights, and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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Safety data sheet number: MI14848
Version: 4
Revision date: 05/Nov/2014
Supersedes date: 03/Aug/2011



Safety Data Sheet VERSACOAT® IC

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name: VERSACOAT® IC
Product code: MI14848

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended use: Emulsifier
Uses advised against: None known

1.3 Details of the supplier of the safety data sheet

Supplier:
MI Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill Industrial Estate
Westhill, AB32 6TG
Scotland UK
+47 5157424

MDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone: (24 Hour) Australia +61 2801 44558, Asia Pacific: +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 570, Middle East and Africa +44 (0) 1235 239 871, New Zealand +64 9939 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards	
Corrosion hazard	Category 1
Serious eye damage/irritation	Category 1
Skin sensitisation	Category 1

Environmental hazards: Not classified

Physical Hazards	
Flammable liquids	Category 3

2.2 Label Elements

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Signal word:
DANGER

Hazard statements

H304 - May be fatal if swallowed and enters airways
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H228 - Flammable liquid and vapor
EU specific hazard statements
EUH066 - Repeated exposure may cause skin dryness or cracking

Precautionary Statements - EU (38, 1272/2008)

P210 - Keep away from heat/spark/open flames/hot surfaces. - No smoking
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P291 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P331 - Do NOT induce vomiting

Supplementary precautionary statements

P231 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical/ventilating/lighting equipment
P243 - Take precautionary measures against static discharge
P281 - Avoid breathing dust/fume/gas/mist/vapour/spray
P272 - Contaminated work clothing should not be allowed out of the workplace
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P363 - Wash contaminated clothing before re-use
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
P501 - Dispose of contents/container in accordance with local regulations

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Indication of danger

Flammable
Xi - Harmful
Xi - Irritant

R-codes(s)

R10, R41, R43, R65

Contents: Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics

Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine

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Safety data sheet number: MI14848
Revision date: 05/Nov/2014

3. Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

4. Accidental release measures

4.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

4.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

4.3 Methods and materials for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. After cleaning, flush away traces with water.

4.4 Reference to other sections

See section 13 for more information.

5. Handling and storage

5.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Avoid spills and splashing during use. Take precautionary measures against static discharges.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands before eating, drinking or smoking. Remove contaminated clothing.

5.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions
Ensure adequate ventilation. Keep atmospheric concentrations below exposure limits. Use spark-proof tools and explosion-proof equipment.

Storage precautions

Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid heat, flames and other sources of ignition. Oxidizing agents

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Safety data sheet number: MI14848
Revision date: 05/Nov/2014

6. Storage class

Flammable liquid storage.

Packaging material

Use specially constructed containers only

7.3 Specific end uses

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits

Oil mist (mineral). Workplace exposure limits are currently under review by legislative authorities. This workplace exposure limit (WEL) standard is applicable to highly refined mineral oils and is provided as a guidance limit only. L.T. EXP = 5mg/m³ and ST. EXP = 10mg/m³.

Component	EU OEL - Third List	Austria	Australia	Denmark
Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C14, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-methylpropan-1-ol	Not determined	200 ppm STEL, 600 mg/m ³ STEL, 50 ppm TWA, 150 mg/m ³ TWA	50 ppm TWA, 150 mg/m ³ TWA	50 ppm Ceiling, 150 mg/m ³ Ceiling, 150 mg/m ³ Ceiling, Potential for cutaneous absorption (avoid skin contact)

Component	Malaysia	France	Germany	Hungary
Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C14, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-methylpropan-1-ol	50 ppm TWA, 150 mg/m ³ TWA	50 ppm TWA, 150 mg/m ³ TWA	50 ppm TWA, 150 mg/m ³ TWA	Not determined
Component	New Zealand	Italy	Netherlands	Norway

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Safety data sheet number: MI14848
Revision date: 05/Nov/2014

Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics

2-methylpropan-1-ol

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

3. Composition/information on ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	EC-No.	CAS-No.	Weight % range	Classification (GHS)	Classification (Reg. 1272/2008)	REACH registration number
Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics	626-141-6	-	30-60	Xn, R65, R68	Abs. Tox. 1 (H304) EUH066	01-211946000-43-x
Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine	275-601-0	58990-47-6	30-60	Xi, R43	Skin Sens. 1 (H317)	01-211946070-42-x
Hydrocarbons, C13-C14, isokanes, cyclohexane, < 2% aromatics	918-973-3	-	5-10	Xn, R65, R68	Abs. Tox. 1 (H304) EUH066	01-211946001-30-x
2-methylpropan-1-ol	201-148-0	78-28-1	5-10	R10, Xn, R37/38-41, R67	Skin Irrit. 2 (H315) Eye Dam. 1 (H318) STOT RE 3 (H336) STOT RE 3 (H336) Para. 1 (S) (S20)	01-211946000-23-x

Comments

"Substances which have an EC Number that begins with the number '9' is a Provisional List Number. The list numbers published by ECHA do not have any legal significance. The EC substance definition and related classification & labelling has been determined in the framework of the Regulation (EC) No 1907/2006 (REACH). For information about the related CAS number see list of substances in this SDS.

4. First aid measures

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Safety data sheet number: MI14848
Revision date: 05/Nov/2014

4.1 First Aid

Inhalation

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion

Rinse mouth. Do not induce vomiting without medical advice. If vomiting occurs spontaneously, minimize the risk of aspiration by properly positioning the affected person. Never give anything by mouth to an unconscious person. Immediate medical attention is required.

Skin contact

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact

Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Seek immediate medical attention/advise.

4.2 Most important symptoms and effects, both acute and delayed

General advice

The severity of the symptoms described will vary dependent of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation: Please see Section 11. Toxicological Information for further information.

Ingestion: Please see Section 11. Toxicological Information for further information.

Skin contact

Please see Section 11. Toxicological Information for further information.

Eye contact

Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician: Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Extinguishing media appropriate for surrounding material.

Extinguishing media which shall not be used for safety reasons: None known.

5.2 Special hazards arising from the substance or mixture

Usual fire and explosion hazards

FLAMMABLE. Vapors are heavier than air and may spread along floors.

Hazardous combustion products

Thermal decomposition can lead to release of irritating gases and vapours.

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Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics	Not Determined	Not determined	Not determined	Not determined
Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine	Not Determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C14, isokanes, cyclohexane, < 2% aromatics	Not Determined	Not determined	Not determined	Not determined
2-methylpropan-1-ol	50 ppm TWA, 150 mg/m ³ TWA	Not determined	Not determined	25 ppm Ceiling, 75 mg/m ³ Ceiling, 50 ppm TWA

Component	Poland	Portugal	Romania	Russia
Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C14, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-methylpropan-1-ol	200 mg/m ³ STEL, 600 mg/m ³ STEL, 50 ppm TWA, 150 mg/m ³ TWA	50 ppm TWA	60 ppm STEL, 200 mg/m ³ STEL, 50 ppm TWA	15 mg/m ³ MAK

Component	Spain	Switzerland	Turkey	UK
Hydrocarbons, C13-C14, n-alkanes, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C14, isokanes, cyclohexane, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-methylpropan-1-ol	50 ppm VLA-ED, 154 mg/m ³ VLA-ED	50 ppm STEL, 150 mg/m ³ STEL, 15 mg/m ³ MAK	Not determined	75 ppm STEL, 231 mg/m ³ STEL, 50 ppm TWA, 154 mg/m ³ TWA

Derived No Effect Level (DNEL)

Short term exposure local effects

Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine
Dermal: 1388 µg/cm²
Inhalation: 14605 µg/m³

Long term exposure local effects

Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine
Dermal: 1388 µg/cm²
Inhalation: 14605 µg/m³

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2-methylpropan-1-ol: 310 mg/m³

Short term exposure systemic effects

Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine
Dermal: 2332 µg/cm²
Inhalation: 2338 µg/m³

Long term exposure systemic effects

Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine
Dermal: 14605 µg/cm²
Inhalation: 14605 µg/m³

Predicted No Effect Concentration (PNEC)

Fatty acids, tall-oil, reaction products with diethylenetriamine, maleic anhydride, tetraethylenepentamine and triethylenetetramine
Fresh Water: 0.00217 mg/L
Sea Water: 0.00017 mg/L
Fresh water sediment: 180 mg/kg
Sea sediment: 140 mg/kg
Impact on Sewage Treatment: 1 mg/L
Inertion release: 0.0217 mg/L
2-methylpropan-1-ol
Fresh Water: 0.4 mg/L
Sea Water: 0.04 mg/L
Fresh water sediment: 0.152 mg/kg
Sea sediment: 0.0699 mg/kg
Impact on Sewage Treatment: 10 mg/L
Inertion release: 11 mg/L

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection

It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.

Hand protection

Use protective gloves made of: Neoprene, Nitrile, PVC. Be aware that liquid may penetrate the gloves. Frequent change is advisable.

Respiratory protection

In case of insufficient ventilation wear suitable respiratory equipment. Use respirator with organic vapor protection (A, brown). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

Skin and body protection

Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.

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No smoking. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. Response: P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. P331 Do NOT induce vomiting. Storage: P403 + P235 Store in a well-ventilated place. Keep cool. Disposal: P501 Dispose of contents and container to appropriate waste site or recycler in accordance with local and national regulations.		

Other hazards which do not result in classification

Slightly irritating to respiratory system High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea Repeated exposure may cause skin dryness or cracking May ignite on surfaces at temperatures above auto-ignition temperature Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.

3. COMPOSITION AND INFORMATION OF THE INGREDIENTS OF THE HAZARDOUS CHEMICAL

Substance / Mixture	Substance		
Chemical nature	A complex combination of hydrocarbons obtained from a feedstock derived from the catalytic hydrogenation of carbon monoxide (the Fischer - Tropsh Process), optionally followed by one or more of the following processes: hydrotreatment, hydrosomerisation, hydrocracking. It contains predominantly of branched and linear aliphatic hydrocarbons having carbon numbers in the range of C8 to C26 and boiling in the range of approximately 120C to 360C (248F to 716F).		

Hazardous components

Chemical Name	CAS-No.	Classification	Concentration [%]
Dilutates (Fischer-Tropsch), C8-26 - Branched and Linear	848301-67-7	Asp. Tox.1; H304	<= 100

For explanation of abbreviations see section 16.

4. FIRST-AID MEASURES

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If inhaled Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment. In case of skin contact Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. In case of eye contact Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention. If swallowed If swallowed, do not induce vomiting; transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility; fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing. Give nothing by mouth. Most important symptoms and effects, both acute and delayed If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.		
Protection of first-aiders	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.	
Notes to physician	Treat symptomatically.	

5. FIRE-FIGHTING MEASURES

Substance extinguishing media	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	Do not use water in a jet.
Specific hazards during firefighting	Clear fire area of all non-employee personnel. Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Undetected organic and inorganic compounds. Flammable vapours may be present even at temperatures below the flash point.

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Handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (e 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling. Refer to guidance under Handling section. Storage Other data Drum and small container storage: Drums should be stacked to a maximum of 3 high. Use properly labeled and closable containers. Must be stored in a diked (bundled) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bundled). Locate tanks away from heat and other sources of ignition. Cleaning, inspection and maintenance of storage tanks is a special operation, which requires the implementation of strict procedures and precautions. The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Electrostatic charges will be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk. The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.		

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Packaging material Suitable material: For containers, or container linings use mild steel, stainless steel, Aluminum may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM), which have been specifically tested for compatibility with this product. For container linings, use amine-adsorbent cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B. Unsuitable material: Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPRM), polyvinyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyethylene. However, some may be suitable for glove materials. Container Advice Do not cut, drill, grind, weld or perform similar operations on or near containers. Containers, even those that have been emptied, can contain explosive vapours. Specific use(s) Not applicable		

See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices for Static Electricity).
CENELEC CLC/TR 50404 (Electrostatic – Code of practice for the avoidance of hazards due to static electricity).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

None established.

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA; Manual of Analytical Methods (http://www.cdc.gov/niosh)
Occupational Safety and Health Administration (OSHA), USA; Sampling and Analytical Methods

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Specific extinguishing methods Special protective equipment for firefighters Keep adjacent containers cool by spraying with water. Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).		

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	May ignite on surfaces at temperatures above auto-ignition temperature. Do not breathe fumes, vapor. Do not operate electrical equipment. Evacuate personnel to safe areas.
Environmental precautions	If possible without personal risks. Remove all probable sources of ignition in the surrounding area. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapor or to direct it flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
Methods and materials for containment and cleaning up	For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Observe all relevant local and international regulations. Avoid contact with skin, eyes and clothing.
Evacuate the area of all non-essential personnel.
Ventilate contaminated area thoroughly.
If contamination of site occurs remediation may require specialist advice.
Ensure electrical continuity by bonding and grounding (earthing) all equipment.
Take precautionary measures against static discharge.
Additional advice
For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

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For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet. Local authorities should be advised if significant spillages cannot be contained. 7. HANDLING AND STORAGE Handling General Precautions Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Prevent spillages. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. For comprehensive advice on handling, product transfer, storage and tank cleaning refer to the product supplier. Advice on safe handling equipment Avoid prolonged or repeated contact with skin. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Bulk storage tanks should be diked (bundled). When using do not eat or drink. Ensure that all local regulations regarding handling and storage facilities are followed. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Avoidance of contact Strong oxidising agents. Product Transfer Avoid splash filling. Keep containers closed when not in use. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Do NOT use compressed air for filling, discharging, or handling operations. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of		

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http://www.osha.gov/ Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/ Institut für Arbeitsschutz Deutschen Gesetzlicher Unfallversicherung (IFA), Germany http://www.dguv.de/ifa/hand/index.jsp L'Institut National de Recherche et de Sécurité, (INRS), France http://www.inrs.fr/fraccueil Engineering measures The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use. General Information: Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Do not ingest. If swallowed then seek immediate medical assistance. Personal protective equipment Protective measures Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers. Respiratory protection If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Where air-filtering respirators are unsuitable (e.g. airborne		
Hand protection Remarks Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) must from the following materials may provide suitable chemical protection. Longer term protection: Nitrile rubber. Incident contact/Splash protection: Neoprene rubber. PVC. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perm moisturiser is recommended. Eye protection If material is handled such that it could be splashed into eyes, protective eyewear is recommended. If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection. Skin and body protection Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron. Environmental exposure controls General advice Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation. Information on accidental release measures can be found in section 6.		

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Concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. All respiratory protection equipment and use must be in accordance with local regulations. Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)]. Hand protection Remarks Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) must from the following materials may provide suitable chemical protection. Longer term protection: Nitrile rubber. Incident contact/Splash protection: Neoprene rubber. PVC. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perm moisturiser is recommended. Eye protection If material is handled such that it could be splashed into eyes, protective eyewear is recommended. If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection. Skin and body protection Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron. Environmental exposure controls General advice Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation. Information on accidental release measures can be found in section 6.		

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Appearance	: Liquid.	
Colour	: colourless	
Odour	: Data not available	
Odour Threshold	: Data not available	
Melting point/freezing point	: Data not available	
Initial boiling point and boiling range	: 200 - 320 °C / 392 - 608 °F	
Flash point	: > 85 °C / 185 °F	
Evaporation rate	: Data not available	
Flammability (solid, gas)	: Data not available	
Upper explosion limit	: 5.0 %(V)	
Lower explosion limit	: 0.5 %(V)	
Vapour pressure	: < 1 hPa (25 °C / 77 °F)	
Relative vapour density	: Data not available	
Relative density	: Data not available	
Density	: ca. 0.78 g/cm3 (15 °C / 59 °F)	
Solubility(ies)		
Water solubility	: negligible	
Partition coefficient: n-octanol/water	: Pow: > 6.5	
Auto-ignition temperature	: ca. 210 °C / 410 °F	
Decomposition temperature	: Data not available	
Viscosity		
Viscosity, kinematic	: ca. 2.6 mm2/s (40 °C / 104 °F)	

Conductivity : Low conductivity: < 100 pS/m. The conductivity of this material makes it a static accumulator. A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid

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10. STABILITY AND REACTIVITY		
Reactivity	: The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.	
Chemical stability	: No hazardous reaction is expected when handled and stored according to provisions	
Possibility of hazardous reactions	: Reacts with strong oxidising agents.	
Conditions to avoid	: Avoid heat, sparks, open flames and other ignition sources. In certain circumstances product can ignite due to static electricity.	
Incompatible materials	: Strong oxidising agents.	
Hazardous decomposition products	: Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.	

11. TOXICOLOGICAL INFORMATION

Basis for assessment	: Information given is based on product data, a knowledge of the components and the toxicology of similar products.
Symptoms of Overexposure	: If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.
Information on likely routes of exposure	: Inhalation is the primary route of exposure.
Acute toxicity	
Product:	
Acute oral toxicity	: LD 50 rat: > 5,000 mg/kg Remarks: Expected to be of low toxicity.
Acute inhalation toxicity	: Remarks: Expected to be of low toxicity if inhaled.
Acute dermal toxicity	: LD 50 Rabbit: > 2,000 mg/kg Remarks: Expected to be of low toxicity.

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Product:	Biodegradability	: Remarks: Expected to be readily biodegradable.
Bioaccumulative potential		
Product:	Biocumulation	: Remarks: Contains constituents with the potential to bioaccumulate.
Partition coefficient: n-octanol/water	: Pow: > 6.5	
Mobility in soil		
Product:	Mobility	: Remarks: Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. Large volumes may penetrate soil and could contaminate groundwater. Floats on water.
Other adverse effects	no data available	
Product:	Additional ecological information	: Films formed on water may affect oxygen transfer and damage organisms.

13 DISPOSAL INFORMATION

Disposal methods	Waste from residues	<ul style="list-style-type: none">Recover or recycle if possible.It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.Do not dispose into the environment, in drains or in water courses.Do not dispose of tank bottom by allowing them to drain into the ground.
Contaminated packaging		<ul style="list-style-type: none">Send to drum recoverer or metal reclaimers.Drain container thoroughly.After draining, vent in a safe place away from sparks and fire.Residues may cause an explosion hazard.Do not puncture, cut, or weld uncleaned drums.Comply with any local recovery or waste disposal regulations.Do not pollute the soil, water or environment with the waste container.

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14. TRANSPORTATION INFORMATION		
National Regulations		
International Regulation		
ADR	Not regulated as a dangerous good	
IATA-DGR	Not regulated as a dangerous good	
IMDG-Code	Not regulated as a dangerous good	
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code		
Pollution category	Not applicable	
Ship type	Not applicable	
Product name	Not applicable	
Special precautions	Not applicable	
Special precautions for user		
Remarks	: Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.	
Additional Information		
: MARPOL Annex 1 rules apply for bulk shipments by sea. For bulk shipping this product has been classified under Annex I (Gasoil). This material is not regulated under ADR, RID and does not meet criteria of class 3 for ADN regulations as per section 2.2.3.1.1 (Note 1) and subsection 32.2.5 of Part III of the Manual of Tests and Criteria.		

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals Regulations 2015, Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000, CSHSA 1994 and relevant regulations. Factories and Machinery Act 1967 and relevant regulations. Petroleum (Safety Measures) Act 1984. Environmental Quality Act 1974 and regulation. Motor Vehicles (Construction and Use) (Vehicles Carrying Petroleum Products) Rules, 1965- L.N.405/65 under Road Transport Act, 1987. Motor Vehicles (Construction, Equipment and Use) (Use Of Liquefied Petroleum Gas Fuel System in Motor Vehicles) Rules 1982 – P.U. (A) 392/82 under Road Transport Act, 1987.

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Safety Data Sheet

Shell GTL Saraline 185V

Version 2.0	Revision Date 2015/03/23	Print Date 2015/03/24
Skin corrosion/irritation		
<u>Product:</u>	Remarks: Expected to be slightly irritating.	
Serious eye damage/eye irritation		
<u>Product:</u>	Remarks: Expected to be slightly irritating.	
Respiratory or skin sensitisation		
<u>Product:</u>	Remarks: Not expected to be a sensitiser.	
Germ cell mutagenicity		
<u>Product:</u>	: Remarks: Not expected to be mutagenic.	
Carcinogenicity		
<u>Product:</u>	Remarks: Not expected to be carcinogenic.	

Material	GHS/CLP Carcinogenicity Classification
Distillates (Fischer-Tropsch), C5-26 - Branched and Linear	No carcinogenicity classification.

Reproductive toxicity

Product:	: Remarks: Not expected to impair fertility. Not expected to be a developmental toxicant.
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STOT - single exposure

Product:
Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system. High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

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Safety Data Sheet

Shell GTL Saraline 185V

Version 2.0	Revision Date 2015/03/23	Print Date 2015/03/24
STOT - repeated exposure		
<u>Product:</u>		
Remarks: Repeated exposure may cause skin dryness or cracking.		
Aspiration toxicity		
<u>Product:</u>		
Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.		
Further information		
<u>Product:</u>		
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.		

12. ECOLOGICAL INFORMATION

Basis for assessment	: Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).
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Ecotoxicity

Product:	
Toxicity to fish (Acute toxicity)	: Remarks: Expected to be practically non toxic: L/L/EL/50 > 100 mg/l
Toxicity to crustacean (Acute toxicity)	: Remarks: Expected to be practically non toxic: L/L/EL/50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	: Remarks: Expected to be practically non toxic: L/L/EL/50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	: Remarks: NOEC/NOEL expected to be > 0.1 - <= 1.0 mg/l (based on modeled data)
Toxicity to crustacean (Chronic toxicity)	: Remarks: NOEC/NOEL expected to be > 0.1 - <= 1.0 mg/l (based on modeled data)
Toxicity to microorganisms (Acute toxicity)	: Remarks: Expected to be practically non toxic: L/L/EL/50 > 100 mg/l

Persistence and degradability

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Safety Data Sheet

Shell GTL Saraline 185V

Version 2.0	Revision Date 2015/03/23	Print Date 2015/03/24
Other international regulations		
The components of this product are reported in the following inventories:		
DLS	: All components listed or polymer exempt.	
TSCA	: All components listed or polymer exempt.	
AICS	: All components listed or polymer exempt.	
IECSC	: All components listed or polymer exempt.	
PICCS	: All components listed or polymer exempt.	
16. OTHER INFORMATION		
Full text of H-Statements		
H304	: May be fatal if swallowed and enters airways.	
Full text of other abbreviations		
Asp. Tox.	: Aspiration hazard	
Abbreviations and Acronyms	: The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.	
Further information		
Training advice	: Provide adequate information, instruction and training for operators.	
Other information		
: This product is intended for use in closed systems only.		
Sources of key data used to compile the Safety Data Sheet		
: The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID data base, EC 1272 regulation, etc).		

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

16 / 16 800001035454 MY

Safety data sheet number: M11042
Version 5
Revision date 26/Jun/2015
Supersedes date 08/Mar/2013



Safety Data Sheet
ECOTROL® RD

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier.

Product name	ECOTROL® RD
Product code	M11042
REACH Registration Name	Exempt
Denmark Pr. no.	1918172

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended use	Filtration-control.
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Uses advised against	Consumer use
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1.3 Details of the supplier of the safety data sheet.

Supplier M1 Drilling Fluids UK Limited C/O Schlumberger Enterprise Drive Westhill Industrial Estate Westhill, AB32 6TQ Scotland UK +47 51577424	
MISDS@slb.com	
1.4 Emergency Telephone Number	
Emergency telephone : (24 Hour) Australia +61 281 44528, Asia Pacific +65 3158 1074, China +86 10 5100 3008, Europe +44 20 725 239 879, Middle East and Africa +44 (0) 1235 239 871, New Zealand +64 9529 1493, USA 001 281 561 1600.	
Denmark	Poison Control Hotline (DK) +45 82 12 12 12
Norway	Poison information centre: +47 22 59 13 10

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards	Not classified
Environmental hazards	Not classified
Physical Hazards	Not classified

2.2 Label Elements

Signal word

None

Hazard statements
This product is not classified as hazardous therefore no (H) hazard statements assigned.

Precautionary Statements - EU (528, 127/2008)
This product is not classified as hazardous therefore has no (P) precautionary statements assigned.

-

Contains
Silica, amorphous

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

3. Composition/information on ingredients

3.1 Substances

Component	EC-No.	CAS-No.	Weight % range	Classification (67/48)	Classification (Reg. 1272/2008)	REACH registration number
Silica, amorphous	Label	Proprietary	<=2	-	Not classified	No data available

3.2 Mixtures

Not Applicable

Comments
The product contains other ingredients which do not contribute to the overall classification.

4. First aid measures

4.1 First Aid

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact
Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice
The severity of the symptoms described will vary dependent of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
Does not form explosive mixture in air.

Hazardous combustion products
Heating or fire can release toxic gas, Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. If spilled, take caution, as material can cause surfaces to

Respiratory protection
No personal respiratory protective equipment normally required. In case of insufficient ventilation wear suitable respiratory equipment. Half mask with a particle filter P2 (BS EN 143). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.
Skin and body protection
Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures
Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.



9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid
Appearance	Powder Dust
Odour	Odourless
Colour	White
Odor threshold	Not applicable

Property	Values	Remarks
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pH @ dilution	No information available	
Melting/freezing point	No information available	
Boiling point/range	No information available	
Flash Point	No information available	
Evaporation rate	Not Applicable	
Flammability (solid, gas)	Not applicable	
Flammability Limits in Air	Not applicable	
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	No information available	
Bulk density	No information available	
Relative density	1.03 kg	@ 20 °C
Water solubility	Insoluble in water	
Solubility in other solvents	Aromatic solvents Ester	
Autotemperature	400 °C	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Viscosity, dynamic	No information available	
Log Pow	No information available	

Explosive properties
No information available

Oxidizing properties
No information available

9.2 Other information

Four point
No information available

Molecular weight
No information available
VOC content(%)
No information available
Density VALUE
No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid

Protect from moisture. Avoid dust formation. Heat, flames and sparks. Keep away from direct sunlight.

10.5 Incompatible materials

Strong oxidising agents.

10.6 Hazardous decomposition products

See also section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation of dust in high concentration may cause irritation of respiratory system.

Inhalation

May cause slight irritation.

Skin contact

Prolonged contact may cause redness and irritation.

Ingestion

Ingestion may cause stomach discomfort.

Unknown acute toxicity
Not Applicable.

Component	LC50 Oral	LC50 Dermal	LC50 Inhalation
Silica, amorphous	No data available	No data available	> 2.2 mg/L (50) 1 h

become very slippery. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. Avoid dust formation. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures
Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions
Ensure adequate ventilation. Keep away from heat, sparks, and flame. Take precautionary measures against static discharges.

Storage precautions
Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Avoid contact with: Strong oxidising agents. Keep away from direct sunlight.

Storage class
Chemical storage.

Packaging material
Use specially constructed containers only.

7.3 Specific end uses

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits
NUI = Nuisance dust, TWA 4mg/m³ Respirable Dust, 10mg/m³ Total Dust.

Component	EU DEL - Third List	Austria	Australia	Denmark
Silica, amorphous	Not determined	4 mg/m ³ TWA (inhalable fraction)	10 mg/m ³ TWA (inhalable dust)	Not determined

Component	Malaysia	France	Germany	Hungary
Silica, amorphous	10 mg/m ³ TWA	Not determined	Not determined	Not determined

Component	New Zealand	Italy	Netherlands	Norway
Silica, amorphous	10 mg/m ³ TWA	Not determined	Not determined	Not determined

Component	Poland	Portugal	Romania	Russia
Silica, amorphous	10.0 mg/m ³ TWA, total inhalable dust 2 mg/m ³ TWA, respirable dust	Not determined	Not determined	Not determined

Component	Spain	Slovenia	Turkey	UK
Silica, amorphous	Not determined	4 mg/m ³ TWA, inhalable	Not determined	Not determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection
It is good practice to wear Safety Glasses with Side-shields when handling any chemical.

Hand protection
Use protective gloves made of: Neoprene, Rubber. Frequent change is advisable.

Sensitisation
This product does not contain any components suspected to be sensitizing.

Mutagenic effects
This product does not contain any known or suspected mutagens.

Carcinogenicity
This product does not contain any known or suspected carcinogens.

Reproductive toxicity
This product does not contain any known or suspected reproductive hazards.

Routes of exposure
None known.

Routes of entry
No route of entry noted.

Specific target organ toxicity (single exposure)
Not classified.

Specific target organ toxicity (repeated exposure)
Not classified.

Aspiration hazard
No hazard from product as supplied.

12. Ecological information

12.1 Toxicity

The product (component(s)) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
This product is not considered toxic to algae.

Toxicity to fish
This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Silica, amorphous	> 5000 mg/L EC50 (Baculatio viridis)	> 440 mg/L EC50 (Pseudoklebsiella aerogenes 72 h)	> 7600 mg/L EC50 (Ceriodaphnia dubia 48 h)

12.2 Persistence and degradability

The product is not biodegradable.

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

Mobility
Insoluble in water.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products
Dispose of in accordance with local regulations.

Contaminated packaging
Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWG waste disposal No.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWG waste disposal No. 07 01 09.

14. Transport information

14.1 UN number

Not regulated

14.2 Proper shipping name
The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

ADR/RHD/ADN/ADR Hazard class
IMDG Hazard class
ICAO Hazard class/division

Not regulated
Not regulated
Not regulated

Property	Values	Remarks
pH @ dilution	Approximately 11.5	
Melting / freezing point	No information available	
Boiling point/range	> 100 °C / > 212 °F	
Flash point	151.6 °C / 305 °F	PMCC
Evaporation rate	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		
Upper flammability limit	Not applicable	
Lever flammability limit	Not applicable	
Vapour pressure	No information available	
Vapour density	No information available	
Specific gravity	No information available	
Bulk density	No information available	
Relative density	1.10 kg	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	4 cP	@ 25 °C
log Pow	No information available	

Explosive properties Not applicable
Oxidising properties None known

9.2. Other information
Pour point -12°C (<11°F)
Molecular weight No information available
VOC content(%) None
Density No information available

10. Stability and reactivity

10.1. Reactivity

No specific reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of Hazardous Reactions

Hazardous polymerisation
Hazardous polymerisation does not occur.

10.4. Conditions to avoid

Store at room temperature. Avoid frost.

10.5. Incompatible materials

Acids. Do not add nitrates or other nitrosating agents to this product. May cause formation of nitrosamine.

10.6. Hazardous decomposition products

See Section 5.2.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	
Inhalation	Inhalation of vapours in high concentration may cause irritation of respiratory system.
Eye contact	Causes serious eye irritation.
Skin contact	Prolonged contact may cause redness and irritation.
Ingestion	Ingestion may cause stomach discomfort.
Unknown acute toxicity	Not applicable.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethanol, 2-propanol- reaction products with ammonia, morpholine derivatives residues	2600 mg/kg (Rat)	>2600 mg/kg (Rat)	No data available

Sensitisation	This product does not contain any components suspected to be sensitizing.
Mutagenic effects	This product does not contain any known or suspected mutagens.
Carcinogenicity	This product does not contain any known or suspected carcinogens.

Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
Routes of exposure	Eye contact.
Routes of entry	None known.
Specific target organ toxicity (single exposure)	Not classified.
Specific target organ toxicity (repeated exposure)	Not classified.
Aspiration hazard	Not applicable.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Germany, Water Endangering Classes (VwVwS) Water endangering class = 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons
No poisons schedule number allocated

New Zealand hazard classification Eye Irrit. Cat. 2 / Chronic aquatic toxicity - Cat. 3

HSNO approval no. HSR030599

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/105/EEC and 2000/2/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition (NOHSC: 2011 (2003)).
National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances (NOHSC:1068 (2004) 3rd Edition).
National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment (NOHSC:1003 (1999)).

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

ADG Code – Australian Dangerous Goods Code.

International Inventories

USA, Toxic Substances Control Act Inventory (TSCA)	Complies
European Union - EINECS and ELINCS	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Inventory - Japan - Existing and New Chemicals list	Does not Comply
China (ECSC)	Complies
Australia (ACCS)	Complies
Korea (KECL)	Does not Comply
Inventory - New Zealand - Inventory of Chemicals (NZIC)	Complies

15.2. Chemical Safety Report

No information available

16. Other information

Prepared by Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Anna Kathi (Anika) Fosse

Supersedes date	11/Jan/2017
Revision date	22/Feb/2017
Version	11

This SDS has been revised in the following section(s)
2, 3, 4, 7, 10, 11, 12, 13, 15, 16 There have been changes with regard to classification.

Text of R phrases mentioned in Section 3
R36 - Irritating to eyes

R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Full text of H-Statements referred to under sections 2 and 3

H319 - Causes serious eye irritation
H412 - Harmful to aquatic life with long lasting effects

*A mark of M H L.L.C., a Schlumberger Company

Disclaimer
The information contained herein is considered in good faith as reliable of the date issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose, any express or implied warranty, or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

12. Ecological information

12.1. Toxicity

Harmful to aquatic life with long lasting effects

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Ethanol, 2-propanol- reaction products with ammonia, morpholine derivatives residues	OECD: Acute LC50 96 hours Semi-static: Fish > 45 g/l	OECD: Acute EC50 (growth rate) 72 hours Static: Algae 45 mg/ligh OECD: OH Algae, Growth Inhibitor Test, Chronic: NOEC 72 hours Static: Algae 3.2 mg/l	OECD: Acute EC50 48 hours Static: Daphnia > 100 g/l

12.2. Persistence and degradability

Not readily biodegradable.

12.3. Bioaccumulative potential

No bioaccumulation expected due to high molecular weight.

12.4. Mobility in soil

Mobility
The product is water soluble, and may spread in water systems.

12.5. Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

13. Disposal considerations

13.1. Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging

Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWV Waste Disposal No

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWV waste disposal No: 07 01 04

14. Transport information

14.1. UN number

Not regulated

14.2. UN proper shipping name

The product is not covered by international regulation on the transport of dangerous goods

14.3. Hazard class(es)

ADR/RIDA/ADN/AWG Hazard class Not regulated

IMDG Hazard class Not regulated

ICAO Hazard classification Not regulated

14.4. Packing group

ADR/RIDA/ADN/AWG Packing group Not regulated

IMDG Packing group Not regulated

ICAO Packing group Not regulated

14.5. Environmental hazard

No

14.6. Special precautions

Not applicable

14.7. Transport in bulk according to Annex III of MARPOL 72/78 and the IBC Code

Please contact MSDCS@sb.com for info regarding transport in bulk.

15. Regulatory information

Safety Data Sheet SAFE-SCAV® CA

1. Identification of the substance/preparation and of the Company/undertaking

1.1. Product Identifier

Product name	SAFE-SCAV® CA
Product code	PID1387
Denmark Pz. no.	1333035

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Oxygen Scavenger.

Uses advised against Consumer use

1.3. Details of the supplier of the safety data sheet

Supplier
M.I. Drilling Fluids UK Limited
C/O Schlumberger
Enterprise Drive
Westhill Industrial Estate
Westhill, AB53 6TD
Scotland UK
+47 55157424
MSDC@sb.com

1.4. Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1253 239 670, Middle East and Africa +44 (0) 1253 239 671, New Zealand +64 9929 1483, USA 001 281 961 1600
Denmark Person Contact Hotline: B001 +45 82 12 12 12
Norway Person information centre: +47 22 59 13 00

2. Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards Not classified

2.2. Label elements

Signal word
None

Hazard statements

This product is not classified as hazardous therefore no (H) hazard statements assigned.

Precautionary Statements - EU (628, 1272/2008)

This product is not classified as hazardous therefore no (P) precautionary statements assigned.

-

-

Contains

2.3. Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DAINGEROUS GOODS.

3. Composition/information on ingredients

3.1. Substances

This product does not contain any hazardous ingredients, or ingredients with national workplace exposure limits.

3.2. Mixtures

Not applicable

4. First aid measures

4.1. First Aid

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.
Eye contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Get medical attention if any discomfort continues.

6.2 Most important symptoms and effects, both acute and delayed.

General advice
The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.
Ingestion Please see Section 11. Toxicological Information for further information.
Skin contact Please see Section 11. Toxicological Information for further information.
Eye contact Please see Section 11. Toxicological Information for further information.

6.3 Indication of any immediate medical attention and special treatment needed.

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media.

Suitable extinguishing media
Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
Do not use water jet.

6.2 Special hazards arising from the substance or mixture.

Unusual fire and explosion hazards
Dust may form explosive mixture in air.

Hazardous combustion products
Fire or high temperatures create: Carbon oxides (CO).

6.3 Advice for firefighters.

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures.

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. If spilled, take caution, as material can cause surfaces to become very slippery. Use personal protective equipment. See also section 8.

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6.2 Environmental precautions.

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up.

Methods for containment
Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimise spreading.

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections.

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling.

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures
Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities.

Technical measures/precautions Ensure adequate ventilation. Take precautionary measures against static discharges.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid contact with: Heat, flames and sparks. Strong oxidising agents. Strong bases. Metals.

Storage class Chemical storage.

Packaging material Use specially constructed containers only.

7.3 Specific uses.

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters.

Exposure Limits
The product does not contain any hazardous materials with occupational exposure limits established.
No biological limit allocated.

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Acute toxicity

Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact Dust may cause mechanical irritation.

Skin contact Prolonged contact may cause redness and irritation.

Ingestion Ingestion may cause stomach discomfort.

Unknown acute toxicity Not applicable.

Sensitisation This product does not contain any components suspected to be sensitizing.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity This product does not contain any known or suspected carcinogens.

Reproductive toxicity This product does not contain any known or suspected reproductive hazards.

Routes of exposure None known.

Routes of entry No route of entry noted.

Specific target organ toxicity (single exposure) Not classified.

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard Not applicable.

12. Ecological information

12.1 Toxicity.

The product component(s) is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae This product is not considered toxic to algae.

Toxicity to fish

Page 7 / 11

This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

12.2 Persistence and degradability.

Not readily biodegradable.

12.3 Bioaccumulation potential.

Does not bioaccumulate.

12.4 Mobility in soil.

Mobility
Soluble in water.

12.5 Results of PBT and vPvB assessment.

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods.

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWG waste disposal No. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWG

Page 8 / 11

9.2 Exposure controls.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection Tightly fitting safety goggles. Safety glasses with side shields.
Hand protection Repeated or prolonged contact.: Use protective gloves made of: Nitrile, Butyl, Frequent change is advisable.
Respiratory protection No personal respiratory protective equipment normally required. In case of insufficient ventilation wear suitable respiratory equipment. Half mask with a particle filter P2 (BS EN 143). At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.
Skin and body protection Wear suitable protective clothing. Eye wash and emergency shower must be available at the work place.

Hygiene measures

Wash hands before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.



9. Physical and chemical properties

9.1 Information on basic physical and chemical properties.

Physical state Solid
Appearance Powder/Crystalline
Odour Odourless
Colour White
Odour threshold Not applicable

Property **Values** **Remarks**
pH @ dilution 5.5 - 11.0 @ 10%
Melting/freezing point No information available
Boiling point/range No information available
Flash point No information available
Evaporation rate No information available
Flammability (solid, gas) Not applicable
Flammability Limits in Air

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Upper flammability limit Not applicable
Lower flammability limit Not applicable
Vapour pressure No information available
Vapour density No information available
Specific gravity No information available
Bulk density 1.05 g/cm³ @ 20 °C
Relative density Soluble in water
Water solubility No information available
Solubility in other solvents No information available
Autoignition temperature No information available
Decomposition temperature No information available
Kinematic viscosity No information available
Dynamic viscosity No information available
Log Pow No information available

Explosive properties Suspended dust may present a dust explosion hazard
Oxidising properties None known

9.2 Other information.

Pour point No information available
Molecular weight No information available
VOC content (%) No information available
Density No information available

10. Stability and reactivity

10.1 Reactivity.

Dust may form explosive mixture in air.

10.2 Chemical stability.

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions.

Hazardous polymerisation

Hazardous polymerisation does not occur.

10.4 Conditions to avoid.

Avoid contact with heat, sparks, open flame, and static discharge. Avoid dust formation.

10.5 Incompatible materials.

Metals. Strong bases. Strong oxidising agents.

10.6 Hazardous decomposition products.

See Section 5.2.

11. Toxicological information

11.1 Information on toxicological effects.

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waste disposal No: 07 01 99.

14. Transport information

14.1 UN number.

Not regulated

14.2 Proper shipping name.

The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es).

ADR/RID/ADNADO Hazard class Not regulated
MDO Hazard class Not regulated
ICAO Hazard class/division Not regulated

14.4 Packing group.

ADR/RID/ADNADO Packing group Not regulated
MDO Packing group Not regulated
ICAO Packing group Not regulated

14.5 Environmental hazard.

No

14.6 Special precautions.

Not applicable

14.7 Transport in bulk according to Annex III of MARPOL 73/78 and the IBC Code

Please contact MSDS@mswaco.slb.com for info regarding transport in bulk.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

Germany, Water Endangering Classes (VvVwS)

Water endangering class = 1
No Poisons Schedule number allocated

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/04 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/105/EC and 2000/21/EC, including amendments.

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This safety data sheet complies with the requirements of Regulation (EC) No 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)].

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC-1008 (2004) 3rd Edition].

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC-1003 (1993)].

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADD Code) for transport by road or rail.

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 [P.U.(A) 3162013] (CLASS Regulations)

The Industry Code of Practice on Chemical Classification and Hazard Communication 2014 [P.U. (B) 128/2014] (ICOP) International Inventories

USA, Toxic Substances Control Act Inventory (TSCA)

European Union - EINECS and ELINCS

Canada (DSL)

Philippines (PICCS)

Inventory - Japan - Existing and New Chemicals list

China (IECSC)

Australia (IMCS)

Korea (KECL)

Inventory - New Zealand - Inventory of Chemicals (NZoC)

Inventory - New Zealand - Inventory of Chemicals (NZoC)

Contact REACH@mswaco.slb.com for REACH information.

15.2 Chemical Safety Report.

No information available

16. Other information

Prepared by Global Regulatory Compliance - Chemicals (GRC - Chemicals), Anne Karin (Anika) Fosse

Supersedes date 08/Oct/2014

Revision date 23/Nov/2016

Version 8

The following sections have been revised: 2., 3., 6., 7., 8., 9., 10., 11., 16. No changes with regard to classification have been made.

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Full text of H-Statements referred to under sections 2 and 3

This product is not classified as hazardous therefore no (H) hazard statements assigned.

*A mark of M.L.L.C., a Schlumberger Company

Disclaimer
The information contained herein is considered in good faith as reliable of the date issued and is based upon measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product, merchantability or fitness for purpose; any express or implied warranty, or non-infringement of intellectual property rights, and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

Safety Data Sheet SUREMUL® EH

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name SUREMUL® EH
Product code MI10137AUZ

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended use Emulsifier
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier

Mi Australia Pty Ltd

Level 5

256 St. George Terrace

Perth

WA 6000

T: 08 9440 2500

MISC@slb.com

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5103 3038, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9029 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to (EC) No. 1272/2008

Health hazards

Serious eye damage/eye irritation Category 2
Skin sensitization Category 1

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements



Signal word

WARNING

Hazard statements

H317 - May cause an allergic skin reaction

H319 - Causes serious eye irritation

Precautionary Statements - EU (28, 1272/2008)

P201 - Avoid breathing dust/fume/gas/mist/vapours/spray

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P303 + P361 + P353 - IF ON EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P501 - Dispose of contents/container in accordance with local regulations.

Supplementary precautionary statements

P273 - Contaminated work clothing should not be allowed out of the workplace

P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention

P371 + P373 - If eye irritation persists: Get medical advice/attention

P502 - Take off contaminated clothing and wash before reuse

Contains

2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives

Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics

2-butyryethanol

2-(2-Butyryloxyethyl)anol

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

Classified as Hazardous according to the criteria of NCHCIS.

HAZARDOUS SUBSTANCE, NON-DAINGEROUS GOODS

3. Composition/information on ingredients

3.1 Substances

Not Applicable

Skin contact

Please see Section 11. Toxicological Information for further information.

Eye contact

Please see Section 11. Toxicological Information for further information.

4.2 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards None known.

Hazardous combustion products Fire or high temperatures create: Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

6.4 Reference to other sections

2-(2-Butyryloxyethyl)anol	10 ppm TWA 67.5 mg/m ³ TWA 10 ppm STEL 107.5 mg/m ³ STEL	Not determined	Not determined	100 mg/m ³
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Component	Malaysia	France	Germany	Hungary
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 96.7 mg/m ³ TWA 300 mg/m ³ MAK	2 ppm 9.6 mg/m ³	10 ppm MAK 49 mg/m ³ MAK	Not determined
2-(2-Butyryloxyethyl)anol	Not determined	10 ppm 67.5 mg/m ³	10 ppm MAK 49 mg/m ³ MAK	Not determined

Component	New Zealand	Italy	Netherlands	Norway
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 121 mg/m ³ TWA 360 mg/m ³ MAK	Not determined	100 mg/m ³ GW	10 ppm TWA 50 mg/m ³ TWA 75 mg/m ³ STEL
2-(2-Butyryloxyethyl)anol	Not determined	Not determined	50 mg/m ³ GW	10 ppm TWA 49 mg/m ³ TWA 107.5 mg/m ³ STEL

Component	Poland	Portugal	Romania	Russia
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 96.7 mg/m ³ TWA 300 mg/m ³ MAK	20 ppm TWA	Not determined	5 mg/m ³ MAK
2-(2-Butyryloxyethyl)anol	100 mg/m ³ STEL 67 mg/m ³ TWA	Not determined	Not determined	10 mg/m ³ MAK

Component	Spain	Switzerland	Turkey	UK
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm VLA-EC 240 mg/m ³ VLA-EC 240 mg/m ³ STEL 96 mg/m ³ MAK	Not determined	60 ppm STEL 240 mg/m ³ STEL 240 mg/m ³ STEL 49 mg/m ³ MAK	Not determined
2-(2-Butyryloxyethyl)anol	20 ppm VLA-EC 240 mg/m ³ VLA-EC 240 mg/m ³ STEL 96 mg/m ³ MAK	Not determined	20 ppm TWA 96 mg/m ³ TWA 123 mg/m ³ TWA	Not determined

See section 13 for more information.

7. Handling and storage

7.1 Preparations for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Do not breathe vapours or spray mist. Avoid spills and splashing during use. Persons susceptible to allergic reactions should not handle this product.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from direct sunlight. Do not freeze.

Storage class Chemical storage.

Packaging material Use specially constructed containers only.

7.3 Specific end uses

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits

Oil mist (mineral) workplace exposure limits are currently under review by legislative authorities. The workplace exposure limit (WEL) standard is applicable to highly refined mineral oils and is provided as a guidance limit only. LT. EXP = 5 mg/m³ and ST. EXP = 10 mg/m³.
No biological limit allocated

Component	EU OEL	Austria	Australia	Denmark
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 96 mg/m ³ TWA 50 ppm STEL 240 mg/m ³ STEL Possibility of significant uptake through the skin	Not determined	skin irritation 20 ppm TWA 50 ppm STEL 240 mg/m ³ STEL	20 ppm 96 mg/m ³

2-(2-Butyryloxyethyl)anol	10 ppm TWA 67.5 mg/m ³ TWA 10 ppm STEL 107.5 mg/m ³ STEL	Not determined	Not determined	100 mg/m ³
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Component	Malaysia	France	Germany	Hungary
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 96.7 mg/m ³ TWA 300 mg/m ³ MAK	2 ppm 9.6 mg/m ³	10 ppm MAK 49 mg/m ³ MAK	Not determined
2-(2-Butyryloxyethyl)anol	Not determined	10 ppm 67.5 mg/m ³	10 ppm MAK 49 mg/m ³ MAK	Not determined

Component	New Zealand	Italy	Netherlands	Norway
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 121 mg/m ³ TWA 360 mg/m ³ MAK	Not determined	100 mg/m ³ GW	10 ppm TWA 50 mg/m ³ TWA 75 mg/m ³ STEL
2-(2-Butyryloxyethyl)anol	Not determined	Not determined	50 mg/m ³ GW	10 ppm TWA 49 mg/m ³ TWA 107.5 mg/m ³ STEL

Component	Poland	Portugal	Romania	Russia
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 96.7 mg/m ³ TWA 300 mg/m ³ MAK	20 ppm TWA	Not determined	5 mg/m ³ MAK
2-(2-Butyryloxyethyl)anol	100 mg/m ³ STEL 67 mg/m ³ TWA	Not determined	Not determined	10 mg/m ³ MAK

Component	Spain	Switzerland	Turkey	UK
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm VLA-EC 240 mg/m ³ VLA-EC 240 mg/m ³ STEL 96 mg/m ³ MAK	Not determined	60 ppm STEL 240 mg/m ³ STEL 240 mg/m ³ STEL 49 mg/m ³ MAK	Not determined
2-(2-Butyryloxyethyl)anol	20 ppm VLA-EC 240 mg/m ³ VLA-EC 240 mg/m ³ STEL 96 mg/m ³ MAK	Not determined	20 ppm TWA 96 mg/m ³ TWA 123 mg/m ³ TWA	Not determined

2-(2-Butyryloxyethyl)anol	10 ppm TWA 67.5 mg/m ³ TWA 10 ppm STEL 107.5 mg/m ³ STEL	Not determined	Not determined	100 mg/m ³
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Component	Malaysia	France	Germany	Hungary
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 96.7 mg/m ³ TWA 300 mg/m ³ MAK	2 ppm 9.6 mg/m ³	10 ppm MAK 49 mg/m ³ MAK	Not determined
2-(2-Butyryloxyethyl)anol	Not determined	10 ppm 67.5 mg/m ³	10 ppm MAK 49 mg/m ³ MAK	Not determined

Component	New Zealand	Italy	Netherlands	Norway
2-Butenediamide, (E), N,N-di-(4,5-dihydro-2-norvalol-1H-imidazo-1-yl)ethyl derivatives	Not determined	Not determined	Not determined	Not determined
Hydrocarbons, C13-C18, n-alkanes, isookanes, cyclo, < 2% aromatics	Not determined	Not determined	Not determined	Not determined
2-butyryethanol	20 ppm TWA 121 mg/m ³ TWA 360 mg/m ³ MAK	Not determined	100 mg/m ³ GW	10 ppm TWA 50 mg/m ³ TWA 75 mg/m ³ STEL
2-(2-Butyryloxyethyl)anol	Not determined	Not determined	50 mg/m ³ GW	10 ppm TWA 49 mg/m ³ TWA 107.5 mg/m ³ STEL

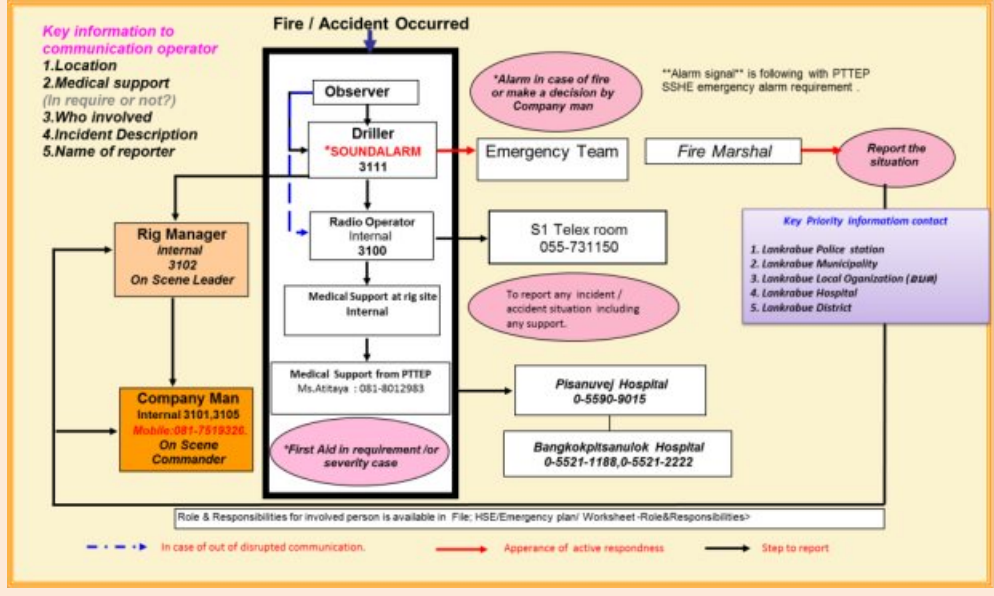
Dermal	89 mg/kg
Inhalation	1001 mg/m ³
2-(2-Butoxyethoxy)ethanol	
Inhalation	67.5 mg/m ³
Long term exposure systemic effects	
2-butoxyethanol	
Dermal	125 mg/kg
Inhalation	98 mg/m ³
2-(2-Butoxyethoxy)ethanol	
Dermal	20 mg/kg



เอกสารแนบ 1-5
รายการสารเคมีและน้ำโคลนที่ใช้ในงานเจาะหลุมผลิต
และตัวอย่างเอกสารข้อมูลความปลอดภัย

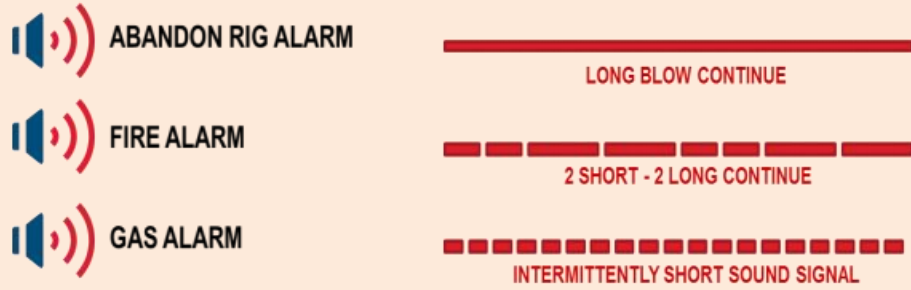


Emergency Communication Plan



On Scene Commander OSC :
PTTEP Supervisor

Emergency Signals



General Instructions

1. Personnel arriving for the first time are required to attend a safety induction by Safety officer upon arrival.
2. Each person shall familiarize themselves with their assigned as shown on the Station Bill immediately upon reporting onboard.
3. All crew members shall be thoroughly familiar with the duties they are assigned to perform in the event of an emergency.
4. All personnel will participate in all as if it were an actual emergency. All personnel will report to the muster area and dressed in full work attire including general PPE
5. **Any person discovering an emergency, accident or incident must be reported immediately to DSV.**

Abandonment

- STEP 1: Rig or life threatening event occurs
STEP 2: Rig manager consults with Client
STEP 3: Rig manager sounds rig abandonment alarm
STEP 4: Rig manager directs/consults with rig evacuation team
STEP 5: All personnel assemble at mustering point awaiting for instruction.
STEP 6: All personnel abandon rig site

Fire

- STEP 1: Observe fire or emergency situation.
STEP 2: Observer shall sound alarm.
STEP 3: Observer shall notify Rig manager.
STEP 4: Rig manager shall contact the Client.
STEP 5: Rig manager shall direct the emergency squad's actions.
STEP 6: Rig manager shall contact fire fighting services and project manager

Well Control

- STEP 1: Driller suspects kick and flow check
STEP 2: Driller confirms flow
STEP 3: Driller closes the BOP
STEP 4: Driller sounds the well control alarm
STEP 5: Driller informs Rig manager and Client
STEP 6: Driller, Rig manager and Client representative figure out kill sheet
STEP 7: Rig manager informs project manager
STEP 8: Client/Rig Manager supervises operation

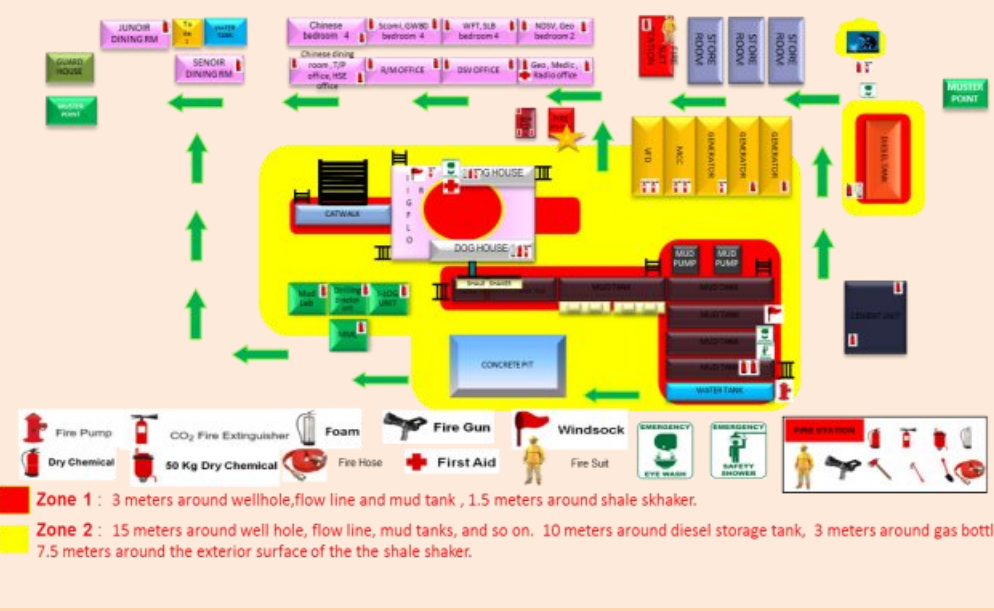
Injury

- STEP 1: Witness observes injury
STEP 2: The observer notifies Rig manager and Client
STEP 3: Witness remains with the injured person
STEP 4: Rig manager directs Injury Response Team
STEP 5: Rig manager, with help of Medic, contacts hospital if necessary
STEP 6: Rig manager contacts appropriate evacuation transportation

H2S Gas

- STEP 1: Driller detect or suspect H2S.
STEP 2: Driller informs Rig manager and Client.
STEP 3: Rig manager consults with Client.
STEP 4: Driller sounds the gas alarm.
STEP 5: All personnel assemble at upwind mustering point.
STEP 6: Driller, Rig manager and Client continue monitor levels whilst circulation control well

Evacuation Route and Muster Point



Rig ERT Structure

Fire Fighting Team Muster Station: Fire Suit Station		Stretcher team Muster Station: Clinic	
Assistance Driller	Fire Marshal	Toolpusher	Lead stretcher team
Foreman Extra hand	Fire Pump Control	Medic	Medic
Roustabout (On Duty)	Fire man with fire gun	Extra hand (On Duty)	Assists as directed
Roustabout (On Duty)	Fire man	Extra hand (On Duty)	Assists as directed
Roustabout (On Duty)	Fire man	Extra hand (On Duty)	Assists as directed

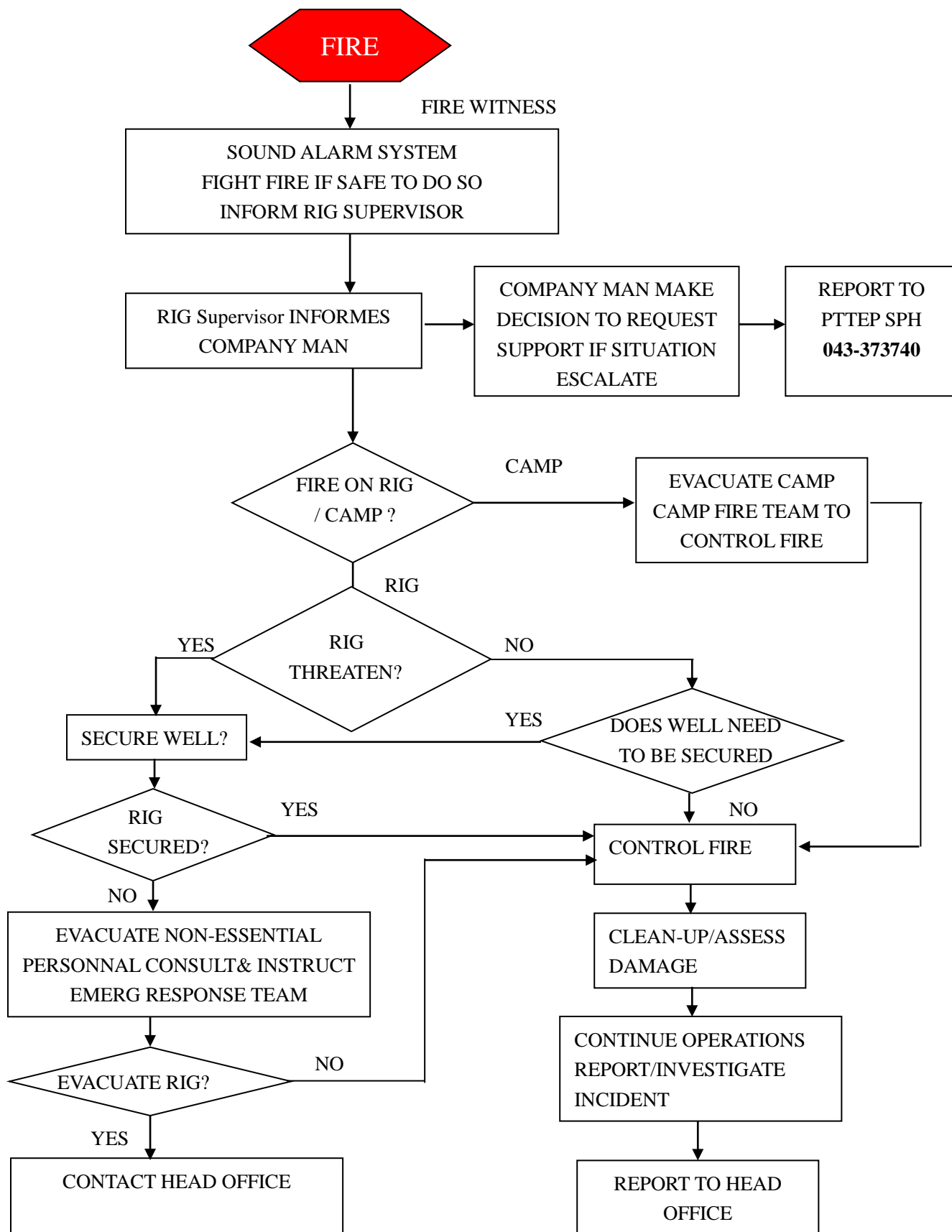
Spare team Stand by		Well Control Team Muster Station: Drill Floor	
Foreman Roustabout	Spare No.1	Rig Manager	Person In Charge
Foreman Roughneck	Spare No.2	Driller	Recognize - Detect indication of kick
Derrick man	Spare No.3	Assistance Driller	Check equipment for possible failure
Asst. Derrick man	Spare No.4	Foreman Extra hand	Check flow line, BOP, hydraulic lines, kill/choke manifold, mud samples
Roughneck (On Duty)	Spare No.5		
Roughneck (On Duty)	Spare No.6		

Muster Checker & Support	
Rig Manager	Muster Checker
Radio operator	Asst. Muster Checker

Persons Without Emergency Duties	
Stop work and make area safe. Proceed to designated Muster Point, collect your T-Card, stand in line and follow instructions from Muster Checker Wait for further instructions	




E-08 Flow chart in case of fire





เอกสารแนบ 1-7
แผนดำเนินการในงานเจาะหลุมผลิต



	PTT Exploration & Production Public Co., Ltd.	DL-DEO-101 Revision 3
	Well Control Manual	Date : 12 Oct. 2011

WELL CONTROL MANUAL

Document No: DL-DEO-101

Revision 3

	PTT Exploration & Production Public Co., Ltd.	DL-DEO-101 Revision 3
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PTT Exploration and Production Public Company Limited

DRILLING PROGRAMME PHU HORM-13

THAI ONSHORE WELL OPERATIONS DEPARTMENT
REPORT NO. HQ 201905705.1

www.pttep.com

DRILLING PROGRAM DEVELOPMENT WELLS

WELL: PHU HORM-13

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PTT Exploration & Production Public Co., Ltd.

DL-DMS-DT-100
Revision 1

Drilling Management System Description

Date : 15 Aug. 2011

DRILLING MANAGEMENT SYSTEM DESCRIPTION

Document No: DL-DMS-DT-100

Revision 1



Drilling Management System Description

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	Drilling Standards, Procedures & Guidelines	Date : 15 Aug. 2011

DRILLING STANDARDS, PROCEDURES & GUIDELINES

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PTT Exploration and Production Public Company Limited

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Emergency and Crisis Management Standard

SSHE-106-STD-500
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Emergency and Crisis Management Standard

SSHE-106-STD-500
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4	Changes from previous version are as follows: <ul style="list-style-type: none">Revised the positions and duty functions to reflect current organizationUpdated Risk Assessment Matrix	CEO	May 2016



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1. PURPOSE

Typical process of emergency and crisis management involves preparedness, response, recovery and mitigation phases. Preparedness and planning for an emergency or crisis are an important part of the company operations in preventing the fatalities and injuries, reducing damages to the environment and property. The ultimate objective of emergency and crisis management is to accelerate the resumption of normal operation. For the planning phase to be effective, the emergency and crisis management and response plans shall be developed for guiding the corporate and Asset/field personnel to prepare for and respond to those situations and to test how efficiency the plans are. In addition, testing the plan through periodic drills and exercises also promotes the awareness and shows the company commitment to the safety of personnel.

This Emergency and Crisis Management Standard is established to:

- Provide the PTTEP divisions/Assets a standard of emergency and crisis management system and organizational structure including necessary resources, in response to the emergency and mitigation or prevention of the emergency and crisis situation
- Promote a use of common terminology in emergency and crisis management, especially the command titles

2. SCOPE

This standard applies to all emergency and crisis situations occurred within premises owned or controlled by PTTEP or its subsidiaries. This also includes other relevant agencies that may be requested to provide assistance or expertise to cope with PTTEP emergency or crisis situations.

This is to be used in conjunction with other crisis and emergency documents, which will be developed under this standard, for example corporate/Asset emergency management plan, corporate/ Asset crisis management plan, site specific emergency response and other contingency procedures/ plans.

Notification, reporting and investigation of all emergency and crisis situations are outlined in the Incident Management standard.



3. REFERENCES

3.1 PTTEP SSHE CONTROLLING DOCUMENTS

Document Number	Document Title
SSHE-106-Manual-000	PTTEP SSHE Management System Manual
SSHE-106-STD-300	PTTEP SSHE Management System
SSHE-106-STD-340	SSHE Training and Competency Standard
SSHE-106-STD-400	PTTEP Risk Assessment Standard
SSHE-106-STD-590	Chemical Management Standard
SSHE-106-STD-600	Incident Management Standard
SSHE-106-PDR-501	PTTEP Crisis Management Plan
SSHE-106-PDR-502	PTTEP Emergency Management Plan
SSHE-106-PDR-503	Corporate Spill Contingency Plan
SSHE-106-GDL-501	Medical Emergency Management Guideline
PTTEP-MS-E04-P001	Relative Response Team Emergency Response Plan

3.2 OTHER REFERENCE DOCUMENTS

Document Number	Document Title
P-1111-1111	PTT Crisis & Emergency Management Standard
-	National Disaster Prevention and Mitigation Plan (แผนป้องกันและบรรเทาสาธารณภัยแห่งชาติ)
-	National Oil Spill Prevention and Response Plan (แผนป้องกันและระงับมลพิษเนื่องจากน้ำมันแห่งชาติ)
IOGP report 526	Tiered Preparedness & Response



4. DEFINITIONS

In this document, the words Crisis, Crisis Management Team Leader, Emergency, Incident Commander and On Scene Commander have the following meanings:

4.1 GENERAL DEFINITIONS

Terminology	Description
Crisis	is a major or catastrophic event (out of control emergency). A crisis could result in sustained national impacts over a prolonged period of time; almost immediately exceeds resources normally available to the company, local authorities and country in the impacted area; and significantly interrupts governmental operations and emergency services to such an extent that national security could be threatened. Crisis may challenge the ability and capacity of communities, company and country to achieve a timely recovery. Crisis situations include terrorism that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, company reputation, national morale, and/ or government functions. In PTTEP crisis situation is treated by a tier 3 response level.
Crisis Management Team (CMT) Leader	The President and Chief Executive Officer (CEO) of the company who has the top authority to overall manage a group/ company impact related to any crisis situations. He has the authority to activate corporate Crisis Management Team (CMT) and work closely with Asset Crisis Management Team (CMT) and Asset Emergency Management Team (EMT).



Emergency	<p>is an occurrence or event, natural or human caused, that requires an emergency response under determination of affected Asset Senior Vice President (SVP) or GM of International Asset to protect life, property and environment. The external assistance may or may not be needed to supplement the company efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a major or catastrophe in any part of the company premises.</p> <p>Emergency situations can, for example, include disasters, emergencies, terrorist attacks, terrorist threats, fires, floods, oil and hazardous material spills, marine vessel and aircraft accidents, earthquakes, tropical storms, typhoon, war-related disasters, outbreak of diseases and medical emergencies, and etc.</p> <p>In PTTEP emergency situations can be evaluated and treated by using a tier 1 – 2 response level.</p>
Incident Commander (IC)	Affected Asset's SVP or authorized person, who has overall authority and responsibility for supporting and providing tactical activities and action plans to the On Scene Commander (OSC), including the development of strategic objectives. Incident Commander also sets priorities and defines organization of the Emergency Management Team (EMT) and the overall action plans for the particular response. He/she has to work closely with Asset EMT.
On Scene Commander (OSC)	An individual responsible for all onsite responses, especially providing direction and onsite tactical operations and always retains the authority to determine the appropriate course of response actions. The operational sites/ fields are as example, Bongkot, Arthit, S1, PSB, Zawtika, Sham, and etc. OSC shall be a Vice President (VP), field or the top authorized person at that site/ field who has the authority to activate the onsite Emergency Response Team (ERT)



4.2 ORGANISATION AND DEPARTMENTS

Corporate	Refers to the PTTEP Business Groups hierarchically above Asset level, and located in the PTTEP headquarters, Bangkok.
Group	Refers to a corporate level Business Group. These may have associated Divisions, Departments, or operational Assets within their hierarchy.
Division	A Business Group may have one or more distinct groups within its hierarchy. These are referred to as Divisions.
Asset	Refers to an operational Asset, site, or location within a respective Business Group.
Department	A subgroup within a Business Group, Division or Asset.

4.3 LANGUAGE

May	Indicates a possible course of action
Should	Indicates a preferred course of action
Shall	Indicates a course of action with a mandatory status

4.4 COMMON ACRONYMS

- Set out below are common specific terms presented in alphabetical order:

CEO	President and Chief Executive Officer
CCS	Corporate Secretary Division
CCT	Crisis Communication Team
CMC	Crisis Management Centre
CMP	Crisis Management Plan
CMT	Crisis Management Team
COO	Chief Operating Officer
EMT	Emergency Management Team
ERP	Emergency Response Plan
ERT	Emergency Response Team
EVP	Executive Vice President



GM	General Manager
IESG	Oil Industrial Environmental Safety Group Association (Thailand)
JV	Joint Venture
OSC	On Scene Commander
OSRL	Oil Spill Response Limited
PSB	Petroleum Development Support Base
PTT	PTT Public Company Limited
PTTEP	PTT Exploration and Production Public Company Limited
RRT	Relative Response Team
RTN	Royal Thai Navy
SVP	Senior Vice President
VP	Vice President



5. ROLES AND RESPONSIBILITIES

5.1 PRESIDENT AND CHIEF EXECUTIVE OFFICER (CEO)

CEO is responsible for:

- Demonstrating his commitment by supporting the availability of the necessary resources in managing the emergency and crisis situations
- Acting as a leader of Corporate Crisis Management Team (CMT), when the emergency situation is declared as crisis, as well as cooperating with appropriate national and international authorities and media
- Providing strategic objectives to corporate CMT members

5.2 ALL EXECUTIVE VICE PRESIDENTS (EVP)

All EVPs are responsible for:

- Deploying this standard within their respective Assets/Functions
- Maintaining coordination with Senior Vice President (SVP) of the situation
- Providing regular situation update to CMT Leader
- Providing any concerned advice and guidance on particular area of expertise to CMT Leader
- Keeping the CMT Leader informed of any significant impacts/issues relating to PTTEP business
- Assisting the CMT Leader implement appropriate business continuity plan

5.3 ALL ASSET SENIOR VICE PRESIDENT (SVP)

All Asset SVPs are responsible for:

- Acting as a Leader of Emergency Management Team (EMT), so called EMT Leader whenever emergency occurs within their respective divisions/ Assets
- Ensuring the effective emergency management within their respective divisions/ Assets by developing site specific Emergency Response Plan (ERP)
- Delegating the duty personnel, in any related discipline, within their respective divisions/ Assets, to perform their duties as defined in the plan
- Ensuring that their personnel are made aware of their plan and undergo training and exercise to enhance and improve the emergency preparedness and response. This includes demonstration of the competency of site/ field personnel



- Communicating with their site/ field Manager/ VP in establishing a team to address the emergency planning provide drills and exercises, review and update the procedures along with the assistance of SSHE Division
- Monitoring the actual performance against plan, identifying any improvements need, and developing a monitoring and tracking system for verification upon completion of any action
- Providing strategic objectives to EMT members

5.4 ALL GM OF INTERNATIONAL ASSETS

All Asset GMs are responsible for:

- Deploying this standard within their respective Assets and ensure the asset's EMP and CMP are aligned with corporate plans
- Act as the Asset's CMT Leader to manage the Emergency and Crisis situation according to the Asset's CMP and EMP in closely liaison with Corporate's CMT
- Providing regular situation update to Corporate's CMT

5.5 VP, FIELD, GENERAL MANAGER OR AUTHORIZED PERSON AT SITE/FIELD

Asset VP, Field Manager or authorized person at site/ field are responsible for:

- Acting as a Leader of Onsite Emergency Response Team (ERT), so called On Scene Commander (OSC) whenever emergency occurs of their respective divisions/ Assets
- Ensuring the effective emergency management within their respective Assets by maintaining site specific ERP
- Delegating the duty personnel, in any related discipline, within their respective Assets, to perform their duties as defined in the plan
- Ensuring that their personnel are made aware of their plan and undergo training and exercise to enhance and improve the emergency preparedness and response. This includes demonstration of the competency of site/ field personnel
- Establishing a team to address the emergency planning, provide drills and exercises, review and update the procedures along with the assistance of SSHE Division
- Monitoring the actual performance against plan, identifying any improvements need, and developing a monitoring and tracking system for verification upon completion of any action
- Managing and coordinating the activities of all onsite ERT members



5.6 SENIOR VICE PRESIDENT, SSHE DIVISION

SVP, SSHE Division is responsible for:

- Providing advice and support on SSHE related issues.
- Ensuring the Division/Asset in developing its own plan in compliance with this standard
- Ensuring that develop and update the Corporate CMP, and EMP
- Ensuring that the major emergency exercise for each site/field and crisis exercise for corporate are conducted
- Monitoring the implementation of the Emergency and Crisis Management Standard to ensure the effective implementation of emergency and crisis management system throughout PTTEP
- Ensuring readiness of emergency/crisis management resources including emergency/crisis organizations, competency, facilities and etc.



6. EMERGENCY PREPAREDNESS

Within PTTEP, emergency preparedness is focused on establishing protocols and standards for planning, training and exercise, personnel competency, equipment availability and communication management.

6.1 PTTEP EMERGENCY AND CRISIS CLASSIFICATION

This section provides an organizational structure of PTTEP emergency and crisis management at 3-Tier response level. The emergency situation may not be significant initially and may expand to require the additional resources. The structure also establishes a clear co-ordination and communication from the operational Site/Field Level to Asset Level and finally to the Corporate Head Office Level.

3 - Tier response level helps the emergency team to consider the necessary response resources according to its severity and potential impact as follows:

Tier 1:

- Involves a problem which has limited impact and minimal potential for escalating, poses a threat to safety and the environment, poses no threat to the general public
- Can be handled by onsite ERT within a reasonable time frame

Onsite ERT shall be established and members to comprise the Site/Field VP/ Manager or top authorized person as an OSC, other key positions and designated persons of each operational site/ field, as defined in the site specific ERP. The team should include but not limited to the following:

1. ERT Leader (On Scene Commander: OSC)
2. Intervention Team/ Fire Fighting Team
3. Support Team such as Logistics Team, Medical team and etc.
4. Event Logger team

Tier 2:

- Involves an emergency with greater magnitude and major severity in nature or has the potential to escalate and continue for a significant period of time until the public may raise and concern
- May involve damage to PTTEP facilities/ Assets and/ or impact to third parties and may pose a significant threat to safety, the environment and its facilities/ Assets
- May request an external assistant from local authorities in the impact area i.e. Oil Industry Environment Safety Group Association of Thailand (IESG), Royal Thai Navy (RTN) for Thailand operations or the nearby oil and gas operating asset, and etc.



- Results in activation of the Emergency Management Team (EMT)

Corporate EMT shall be established to manage and provide relevant supports to the assets in Tier 2 emergency situation. EMT Members should include the top management/authorized person of the affected Asset and other key positions from various disciplines as defined in the EMP, but not limited to the following:

1. EMT Leader
2. Common members such as Affected Asset duty, Logistic duty, SSHE duty, Relative Response Team duty, Communication team, IT duty, Administration team duty, Event Logger duty, etc.
3. Specific members such as Drilling duty, Construction duty, Well operation duty and etc.

International Assets should also establish the Asset's EMT in order to manage and provide support to operating sites on emergency in the country as appropriate. The Asset's EMT is led by the Asset's GM or delegated person and has sufficient members to manage the emergency according to the Asset's EMP.

Tier 3:

- Involves a catastrophic scenario resulted in the multiple injuries, fatalities, major fires, environmental damage, toxic gas release, significant business interruption and poses a significant threat to the environment or damage to PTTEP Assets and finally bring in significant media attention
- Requests an external assistant from abroad or international resources i.e. the Oil Spill Response Limited (OSRL) and etc.
- **Results in activation of the corporate Crisis Management Team (CMT) and Asset CMT if it occurs in International Asset**

Corporate Crisis Management Team (CMT) shall be established to manage and provide relevant supports to the assets in crisis situation Tier 3. CMT Members should include the top management at the corporate level and other supporting functions, their responsibilities and procedures as defined in the Corporate CMP, but not limited to the following:

1. CMT Leader (CEO)
2. All Top Managements
3. Technical Support team such as Function head of communication & Public Affairs, Legal, SSHE, etc.
4. Administration team

International Assets should also establish the Asset's CMT in order to manage crisis in the country as appropriate. The Asset's CMT is led by the Asset's GM and has sufficient members to manage the crisis according to the Asset's CMP.



Use the PTTEP Risk Assessment Matrix to consider the initial appropriate levels of response to any particular event.

Asset Name	Asset Type	Asset Location	Asset Size	Asset Complexity	Asset Criticality	Asset Risk	Asset Impact	Asset Consequence	Asset Response
Asset 1	Asset 1 Type	Asset 1 Location	Asset 1 Size	Asset 1 Complexity	Asset 1 Criticality	Asset 1 Risk	Asset 1 Impact	Asset 1 Consequence	Asset 1 Response
Asset 2	Asset 2 Type	Asset 2 Location	Asset 2 Size	Asset 2 Complexity	Asset 2 Criticality	Asset 2 Risk	Asset 2 Impact	Asset 2 Consequence	Asset 2 Response
Asset 3	Asset 3 Type	Asset 3 Location	Asset 3 Size	Asset 3 Complexity	Asset 3 Criticality	Asset 3 Risk	Asset 3 Impact	Asset 3 Consequence	Asset 3 Response
Asset 4	Asset 4 Type	Asset 4 Location	Asset 4 Size	Asset 4 Complexity	Asset 4 Criticality	Asset 4 Risk	Asset 4 Impact	Asset 4 Consequence	Asset 4 Response
Asset 5	Asset 5 Type	Asset 5 Location	Asset 5 Size	Asset 5 Complexity	Asset 5 Criticality	Asset 5 Risk	Asset 5 Impact	Asset 5 Consequence	Asset 5 Response
Asset 6	Asset 6 Type	Asset 6 Location	Asset 6 Size	Asset 6 Complexity	Asset 6 Criticality	Asset 6 Risk	Asset 6 Impact	Asset 6 Consequence	Asset 6 Response
Asset 7	Asset 7 Type	Asset 7 Location	Asset 7 Size	Asset 7 Complexity	Asset 7 Criticality	Asset 7 Risk	Asset 7 Impact	Asset 7 Consequence	Asset 7 Response
Asset 8	Asset 8 Type	Asset 8 Location	Asset 8 Size	Asset 8 Complexity	Asset 8 Criticality	Asset 8 Risk	Asset 8 Impact	Asset 8 Consequence	Asset 8 Response
Asset 9	Asset 9 Type	Asset 9 Location	Asset 9 Size	Asset 9 Complexity	Asset 9 Criticality	Asset 9 Risk	Asset 9 Impact	Asset 9 Consequence	Asset 9 Response
Asset 10	Asset 10 Type	Asset 10 Location	Asset 10 Size	Asset 10 Complexity	Asset 10 Criticality	Asset 10 Risk	Asset 10 Impact	Asset 10 Consequence	Asset 10 Response

Figure 1 – PTTEP Risk Assessment Matrix



6.2 RESOURCES MANAGEMENT

The objective of resource management is to ensure all necessary resources are available in a timely manner during emergency/crisis. All foreseeable resources to be inventoried in order to optimize usage of resources while maintaining cost-effectiveness and safety of resources mobilization. A centralized system should be set up to manage resources to set strategies in dealing with acquiring additional resources to reduce responder freelancing. All necessary resources (e.g. documentation, emergency room, personnel, equipment, and etc.), defined in either ERP, EMP or CMP, are to be provided and maintained in a state of readiness, including a list of external resources.

6.2.1 Documentation

The CMP, EMP, Site specific ERP and relevant Contingency Plans (CP) shall include all potential emergency and crisis scenarios.

Corporate CMP and EMP are corporate document, which shall be developed and periodically updated by SSHE Division, to provide CMT and EMT members the detailed information regarding their roles and responsibilities. These plans also detail the actions of CMT and EMT members must take to deal with a real or potential crisis/emergency as well as providing necessary tools and forms to be utilized during the crisis/emergency.

Asset's EMP (Domestic and International) shall be developed and periodically updated by operating Assets to provide the Asset's EMT members the detailed information regarding their roles and responsibilities and specific actions of different potential emergency scenarios. It also provides necessary tools, forms, contact numbers and others which may be utilized during the emergency.

International Asset's CMP: International Asset's CMP shall also develop and periodically update the Asset's CMP to detail the actions of the asset's CMT members must take to deal with the crisis situation in alignment to the Corporate's CMP.

Site Specific ERP is a document of an operational site/ field level developed to provide their ERT members a protocol of onsite tactical response operations. This plan also provides the roles and responsibilities of all response levels, procedural requirements and other useful tools to be followed under emergency conditions.

Note: Contingency Plan (CP) or Pre Incident Planning, shall be developed by relevant departments, details advice on how to handle with a specific emergency scenario e.g. fire or explosion, well blowout, hydrocarbon/ chemical spill, security incident, typhoon evacuation, medical evacuation and etc. This plan shall contain the technical data, the actions to be taken and the reference to special resources which may be used.

The above mentioned documents shall be

- Made available at all locations
- Communicated to and easily accessible for all sites/fields, and



- Practiced regularly to demonstrate its efficiency and practicality as well as the personnel competency

6.2.2 Facilities

At each operating site/field, the "Emergency Control Room" (ECR) shall be allocated and maintained by site administrator or designated person, whereas the "Emergency Management Room" (EMR) and Crisis Management Center (CMC), Crisis Communication Room (CCR) and Relative Response Room (RRR) are set up for the emergency management and crisis management, media response and relative response teams respectively at the Corporate Head Office and maintained by designated person of SSHE Division. Designated location of each site/ field and corporate facilities shall be defined in the ERP, EMP and CMP.

The ECR, EMR, CMC, CCR, and RRR shall properly be equipped with or immediately ready for access to the following minimum requirements:

- Copies of related documents such as CP, site specific ERP, EMP, CMP and this standard
- Adequate phones and hotline which is ready to be called by Incident Commander and are capable of making a call outside the country
- Projector(s)/ computer(s)/ printer(s)
- Fax machine(s)/ photocopier(s)
- All necessary board(s)/ flip chart(s)
- Maps and layouts of the site/ facilities which company involved with
- Emergency contact lists
- Administrative equipment e.g. papers, pens, markers, post it (note), magnet, etc.
- Other emergency equipment that may be required by the emergency team

Administrator/ designated person of each location shall be nominated to maintain the emergency room with his/her responsibility to:

- Regularly check and maintain the room status and response equipment as listed above
- Be familiar with set up of the ECR, EMR and CMC preferably within 10 minutes or as soon as after notification of any emergency/ crisis

Functional test and inspection of all emergency response equipment shall be regularly carried out by the assigned parties following the plans. Where equipment is found to be defective or expired, it must be promptly repaired or replaced. Stock of such equipment shall be maintained. All records shall also be maintained for periodical review in order to determine whether the plans are adequately implemented.



6.2.3 Personnel

The Emergency and Crisis Team members must have qualification and competency to deal with an emergency or a crisis situation. A number of designated duty personnel to form an emergency team, ERT, EMT or CMT, must be suitably assigned. Individual competency of the duty personnel shall be periodically tested to determine whether further training and knowledge is required to develop their capabilities in dealing with the situations.

EMT may be in the form of Duty Roster Team for those assets that have sufficient capability, if some assets that have no capability to have a team of duty roster, then Duty Officer shall be assigned as representative to first deal with an emergency. The details of EMT shall be found in the Asset EMP.

6.3 COMPETENCY MANAGEMENT

6.3.1 Training

Training shall be regularly held to ensure that all emergency team members and other relevant personnel within the respective division/ Asset have knowledge and skills to implement the plan and carry out their roles and duties during the emergency or crisis situation.

Type and frequency of training provided to the team members is based upon the assigned roles and responsibilities and the annual evaluation of training needs. The training courses are provided in the training matrix attached in the SSHE Training and Competency Standard (SSHE-106-STD-340).

6.3.2 Drill and Exercise

In order to evaluate the thoroughness and effectiveness of the emergency and crisis management, it is necessary to conduct periodic drills and exercises, may be table top exercise, functional exercise or full-scale exercise, which shall represent various scenarios designed to challenge each emergency response organization.

At each operating site/ field, simulated drills and exercises with different potential scenarios, for example fire, evacuation, man-overboard, chemical spill, and etc., shall be carried out on a regular basis at a pre-determined interval.

At a corporate level, a crisis exercise with a selected asset shall be carried out once every year among operational site/ field and support functions at their head office, this involves the responses and the communications channel.

Records of drills and exercises are to be kept for further tracking. These records can be used for future planning, determining the status against the requirements, and determining the improvements needed.

7. EMERGENCY RESPONSE

This section describes the response actions ranging from the initial notification to early coordination efforts to assess and disrupt the threat, to prepare activation of emergency team and to deploy other assistances may request. These actions do not necessarily occur in sequential order, many may be undertaken in concurrent responses.

7.1 EMERGENCY/CRISIS NOTIFICATION AND TEAM ACTIVATION

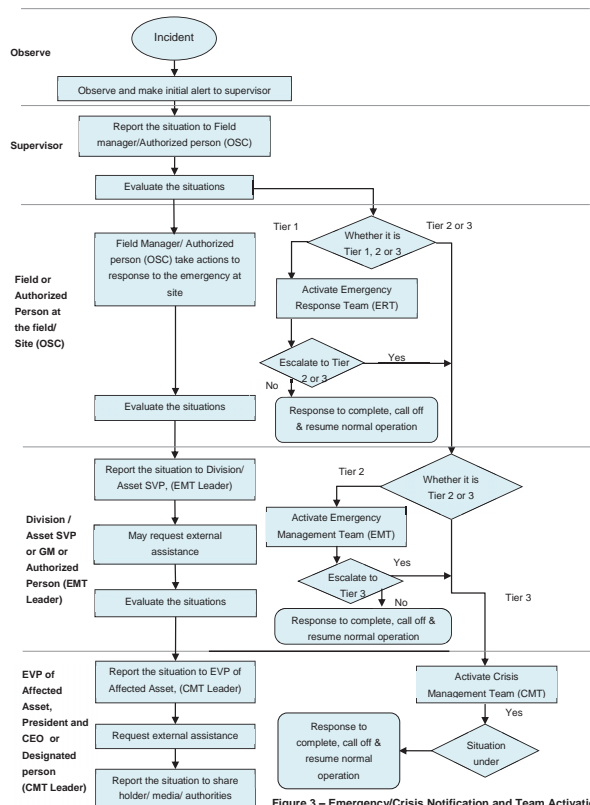


Figure 3 – Emergency/Crisis Notification and Team Activation

7.2 COMMUNICATION AND INFORMATION MANAGEMENT

The objectives of the communication and information management are to:

- Establish and disseminate notification and warnings system
- Formulate, execute and communicate the decision between the emergency and crisis team leader
- Request supporting of emergency and crisis related activities
- Develop and maintain overall awareness within or across the affected and concerned parties and authorities

To prevent loss of life, property and environment, a warning system shall be established to detect any seasonal natural disaster (e.g. Tropical Cyclone/Adverse weather, and etc.) or a data analysis to determine the possibility of its development before issuing the alert or notification messages within the company.

To ensure the effective communication during the emergency situation, all relevant personnel, especially emergency team members, shall be communicated of how to clearly report the situation within and between locations via the specified channel. Clear language and information sharing protocols need to be identified.

Communication facilities, which include telecommunication network and IT facilities, shall be made available at all time. Its quantity and extra equipment shall be adequately supplied depending on the location of site/ field itself, as identified in ERP, EMP and CMP. Instruction of how to use the facilities properly and efficiency should be developed. The periodical checks should also be carried out to ensure readiness of the communication equipment.

A debrief meeting following drills, exercises or any occurrence of a real emergency, regardless of its severity or duration, shall be carried out among all key members participating in emergency to:

- Assess the emergency and crisis management plans against drills, exercises and real emergency/ crisis situations,
- Review any deficiencies of the relevant plans, and
- Identify any remedial actions for further improvement

A report or minutes from the debrief session shall be prepared and approved by emergency and crisis team leader and copied to Senior Vice President, SSHE Division respectively. The progress of all action items is to be followed-up via any relevant SSHE meeting and notified to SSHE Division for further verification, as appropriate.

All communications with third party and off-site personnel must be channelled through the PTTEP authorized person i.e. CMT Leader or designated person(s). The preparation of all communication messages or information shall be prepared by the Crisis Communication Team.

8. EMERGENCY/CRISIS MITIGATION AND RECOVERY

Mitigation strategy shall be developed based on the results of hazard identification and risk assessment, impact analysis, operational experience, cost-benefit analysis, result of incident investigation and lesson learned from previous emergencies within PTTEP and the industry. Mitigation strategy includes measures and activities to be taken/ implemented to reduce exposure to or eliminate risks and to limit/ control the consequences, extent, or severity of an incident that cannot be reasonably prevented. Implementation of mitigation strategies can be a part of the recovery process if applied after the incident occurs.

Incident investigation should be conducted in accordance with Incident Management Standard (SSHE-106-STD-600) as soon as possible and safe to do so, after the emergency/crisis situation has resumed to normal in order to capture actual causes of the incident for proper analysis for mitigations to prevent reoccurrence and for input into the emergency/crisis improvement strategy.

Disaster recovery plan and/or business continuity plan refers to a company ability to recover from an emergency/ crisis incident and resume or continue the operations. These plans should be established to outline the recovery alternatives and activities used to restore critical business process and reputations. The following steps should be followed while developing the plans:

- Set up the strategic objectives
- Identify the scope and boundaries of the plan
- Conduct a business impact analysis which is a study and assessment of financial losses to institution resulting from destructive event
- Conduct sensibility analysis of the plan for CMT Leader/ EMT Leader to make facts based decision
- Communicate to all emergency/ crisis team members to ensure their understanding and support the implementation of the plan



PTT Exploration and Production Public Company Limited

Emergency Management Plan

Document Code: SSHE-106-PDR-502

Revision No: 3

May 2016



Emergency Management Plan

SSHE-106-PDR-502

May 2016

Approval Register

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THIS DOCUMENT WILL BE REVIEWED 5 YEARS FROM DATE OF APPROVAL OR REVISED EARLIER IF NECESSARY

Revision History			
Rev.	Description of Revision	Authorized by	Date
0	<ul style="list-style-type: none"> Compilation and amendments completed. Approved for issue 	PSH Security	Apr 2008
1	<ul style="list-style-type: none"> Revised to reflect organization change Reviewed roles and responsibilities of EMT members to reflect feedback from major emergency exercise performed in December 2010 Added Bangkok Office Officer Duty, Event Logger Duty and Administrator Duty Defined scope to cover all Thailand operating Assets 	CSH	Aug 2011
2	<ul style="list-style-type: none"> Added the notification and communication of International asset Removed the Appendix 4 Media Holding Statement and Appendix 5 Media Press Release Template Revised INA Function Group Officer to International Asset Coordinator Changed the responsibility of informing PTT, DMF and JV Partners from SSHE Duty to CCT Duty person Changed position title of MRT leader to CCT leader 	TSH	Dec 2014
3	<ul style="list-style-type: none"> Revised to reflect organization change Reviewed roles and responsibilities of EMT members Updated Risk Assessment Matrix 	TSH	May 2016



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PTT Exploration and Production Public Company Limited

Crisis Management Plan

Document Code: 12148-PDR-SSHE-501/01-R03

March 2019

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Crisis Management Plan

12148-PDR-SSHE-501/01-R03

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THIS DOCUMENT WILL BE REVIEWED EVERY 5 YEARS FROM DATE OF APPROVAL OR REVISED EARLIER IF NECESSARY

March 2019, Revision 3

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INTRODUCTION

1. PURPOSE

The purpose of the Crisis Management Procedure (CMP) is to define primary responses to be followed in the event of a crisis, or potential crisis, listed in the following order of priority;

- Protection of People
- Environment
- Asset (Property and Business, Liability and Business Continuity)
- Reputation

The CMP has been developed to define the roles and responsibilities of the PTTEP Crisis Management Team (CMT) and to ensure that there is adequate coordination and communication between the responsible parties and the affected Assets emergency.

2. SCOPE

The scope of this CMP covers the response required to an actual or potential incident (whether of PTTEP origin or not) be in Local, National or International, on a scale that may become of significant concern to Company business.

REQUIREMENTS

3. EMERGENCY MANAGEMENT STRUCTURE

3.1 PTTEP CRISIS AND EMERGENCY RESPONSE STRATEGY RELATIONSHIP

There are 3 levels of the Crisis and Emergency Response Strategy which are related as shown in Figure 1.

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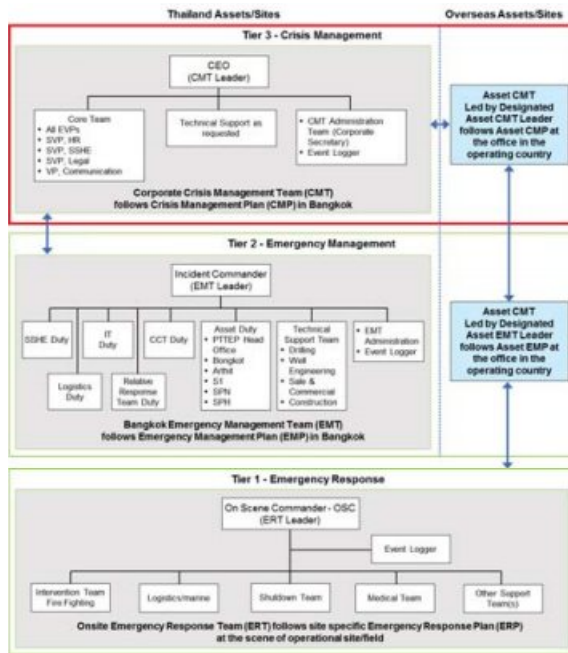


Figure 1: Expanded PTTEP Organizational Structure of Emergency and Crisis Management

3.2 EMERGENCY/CRISIS CLASSIFICATIONS

With reference to the 3-Tier definition of Emergency & Crisis in Emergency and Crisis Management Standard (11038-STD-SSHE-501), Crisis Management covers the situations in Tier 3.

The consequence severity rate matrix can be used as a guideline to consider the initial appropriate levels of response to any particular event (refer to Appendix A: PTTEP Risk Assessment Matrix).

3.3 ORGANIZATION

The CMT consists of 2 groups: Core CMT members and Technical Support Team.

3.3.1 Core Team

The Core Team consists of the following members:

- President & CEO (CMT Team Leader) or the person who is assigned by CEO;
- Chief Operating Officer (COO), Production Asset and Supply Chain Management Group;
- EVP, Engineering, Development and Operations Group;
- EVP, Corporate Affairs and Assurance Group;
- EVP, Finance and Accounting Group;
- EVP, Strategy and Business Development Group;
- EVP, Geosciences, Subsurface and Exploration Group;
- EVP, Business and Organization Transformation Group;
- SVP, Human Resources Division;
- SVP, Corporate SSHE Division;
- SVP, Legal Division; and
- VP, Communications Department.

3.3.2 Technical Support Team

The Technical Support Representative members will be notified and requested to assist the CMT Leader as and when the CMT Leader deems it necessary.

The Technical Representative Team consists of the following members:

- Other concerned SVPs or VPs.
- CMT Administration Team (i.e. Corporate Secretary Staff).
- Event Logger (The assigned person as CMT Event Logger in PTTEP Duty Roster Week.)

3.4 RESPONSIBILITY OF CRISIS MANAGEMENT TEAM (CMT)

3.4.1 CMT Leader

The CMT Leader is responsible for:

- Confirming situation with affected Asset EVP;
- Ensuring that all CMT members are briefed the situation;
- Managing the activities of the CMT, concentrating primarily on priorities and strategy development to respond the crisis as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions;
 - Strategy and action plan; and
 - Communication Strategy (including media).
- Reviewing and adjusting crisis organization, as appropriately as the situation developed;
- Considering support for the Emergency Management Team (EMT) by way of technical or specific assistance;
- Coordinating the efforts of the CMT;
- Authorizing commitments, deviations from normal Procedures, press releases (in conjunction with the External Relation), etc., as required;
- Appointing the Company Spokesperson; and
- Deactivating CMT when situation is normalized.

3.4.2 COO of Production Asset and Supply Chain Management Group

COO of Production Asset and Supply Chain Management Group is responsible for:

- Receiving latest briefing situation from EMT Leader;
- If crisis occurred at Asset, PSB in Songkhla, Ranong and Heliport:
 - Being a focal point to communicate with the EMT and keep updating situation;
 - Ensuring that Bangkok telephone operator is informed to activate CMT if crisis occurred at the area under Operations Support Group;
 - Providing initial briefing of the situation to CMT member and update regularly; and
 - Providing any concerned advice to CMT members.
- Maintaining coordination with SVP or General Manager (GM) of affected Asset of the situation;

- Providing advice to CMT Leader on declaring crisis stage activation; Alert Level;
- Providing any concerned advice to CMT members;
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.
- Providing advice and guidance on particular area of expertise to the CMT Leader as required (logistics and supply chain management).

3.4.3 EVP of Corporate Affairs & Assurance Group

EVP of Corporate Affairs & Assurance Group is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Ensuring that risk management, Corporate communication, legal and Corporate administration provide appropriate support to CMT and Business Continuity Management (if required);
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions;
 - Strategy and action plan; and
 - Communication Strategy (including media).
- Informing Board of Directors on crisis situation and update regularly.

3.4.4 EVP of Finance and Accounting Group

EVP of Finance and Accounting Group is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Advising and assisting with financial planning;
- Providing interim financial support and resources;
- Providing appropriate Corporate financial funds for emergency response, recovery and remediation;
- Advising the concerned parties of status and potential effects;
- Checking and ensuring readiness of insurance as required;



- Preparing information for investors response;
- If crisis occurred at PTTEP head office (Enco) or PTTEP Core Research Center (PCRC):
 - Being a focal point to communicate with the EMT and keep updating situation;
 - Providing advice to CMT Leader on declaring crisis stage activation; Alert Level;
 - Providing initial briefing of the situation to CMT member and update regularly; and
 - Providing any concerned advice to CMT members.
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.

3.4.5 EVP of Engineering, Development and Operations Group

EVP of Engineering, Development and Operations Group is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- If crisis occurred at Engineering Development Projects:
 - Being a focal point to communicate with the EMT and keep updating situation;
 - Providing advice to CMT Leader on declaring crisis stage activation; Alert Level;
 - Providing initial briefing of the situation to CMT member and update regularly; and
 - Providing any concerned advice to CMT members.
- Providing advice to CMT Leader on engineering concerned with the crisis;
- Supporting CMT leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.
- Providing advice and guidance on particular area of expertise to the CMT Leader as required (drilling and well engineering).



3.4.6 EVP of Geosciences, Subsurface and Exploration Group

EVP of Geosciences, Subsurface and Exploration Group is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- If crisis occurred at Exploration Projects:
 - Being a focal point to communicate with the EMT and keep updating situation;
 - Providing advice to CMT Leader on declaring crisis stage activation; Alert Level;
 - Providing initial briefing of the situation to CMT member and update regularly; and
 - Providing any concerned advice to CMT members.
- Supporting CMT leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.
- Providing advice to CMT Leader on Geology concerned with the crisis.

3.4.7 EVP of Strategy and Business Development Group

EVP of Strategy and Business Development Group is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.
- Reviewing impact of the crisis to Business Development Plan and prepare for stakeholders response.

3.4.8 EVP of Business and Organization Transformation Group

EVP of Business and Organization Transformation Group is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Supporting CMT leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;



- Scenario planning;
- Priorities (People, Environment, Asset and Reputation) and immediate actions; and
- Strategy and action plan.
- Reviewing impact of the crisis to Business Development Plan and prepare for stakeholders response; and
- Ensuring readiness of IT infrastructure and systems for emergency/crisis and business continuity management.

3.4.9 SVP of Human Resources Division

SVP of Human Resources Division is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Being a focal point to communicate with the Bangkok Relative Response Team (RRT) and keep updating situation about personal involved i.e. Staff, Relative and etc.;
- Providing advice to CMT Leader on personnel/welfare aspects associated with the emergency, and establishes information flows and timings of briefings;
- Providing the CMT Leader on personnel and welfare issues relating to staff;
- Ensuring appropriate HR related legal advice is available for the CMT Leader when making critical decisions and press releases;
- Identifying welfare requirements and seek direction on a response strategy;
- Making arrangements if necessary, to advise or visit the next of kin of any casualties;
- Ensuring that all personnel not directly involved in the emergency are kept informed; and
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.

3.4.10 SVP, Safety, Security, Health & Environment Division

SVP, Safety, Security, Health & Environment Division is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Providing advice to CMT Leader on SSHE concerned with the crisis;
- Being a focal point to communicate with SSHE duty in EMT to make notifications and reports to concerned authorities or request for support from external parties;



- Keeping the CMT Leader informed of any significant impacts/issues relating to PTTEP business;
- Assisting the CMT Leader implement appropriate business continuity plan; and
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.

3.4.11 SVP, Legal Division

SVP, Legal Division is responsible for:

- Receiving a brief on the situation from CMT Leader or Asset EVP;
- Providing advice to CMT Leader on Legal concerned with the crisis; and
- Supporting CMT leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions; and
 - Strategy and action plan.

3.4.12 VP, Communication Department

VP, Communication Department is responsible for:

- Being a focal point to communicate with the Bangkok Crisis Communication Team (CCT) and keep updating situation about public affair and communication to concerned parties;
- Providing advice to CMT Leader regarding public affairs;
- Keeping an open line of communication with appropriate organizations/national authorities;
- Identifying key information and maintain a log of issues, which are likely to be required by the CMT Leader;
- Establishing a pro-active media liaison and public affairs strategy;
- Briefing the CMT Leader on media interest, issues developing, and requests from the media for information;
- Assisting in developing/delivering a response to the media as directed by the CMT Leader;



- Informing appropriate organizations on aspects of the crisis that may affect them;
- Obtaining information from affected organizations that may be of assistance to the Company;
- Establishing contact numbers where the media can call for information;
- Preparing media, community, and staff briefing material as requested by the CMT Leader; and
- Supporting CMT Leader to manage the activities of the CMT, as follow:
 - Stakeholder and issues/risk mapping;
 - Scenario planning;
 - Priorities (People, Environment, Asset and Reputation) and immediate actions;
 - Strategy and action plan; and
 - Communication Strategy (including media).

3.4.13 CMT Administration Team

Supported by Corporate Secretary staff, is responsible for ensuring that the emergency related information are distributed to concerned parties in the EMT by checking and responding to fax, email and information received or displayed from the Personal Computer panels and distributed information to the CMT.

3.4.14 CMT Event Logger

- Acting as official recorder for the CMT Team;
- Ensuring that all events are accurately recorded in the CMT Event Log Book or relevant soft data file as they occur;
- Liaising with the EMT Event Logger to ensure that all information is recorded;
- Recording all events accurately and clearly stating incident type, location, date and times, etc.; and
- Keeping the CMT informed of any significant events or changes in the status of the emergency.

3.4.15 IT Support

- Support IT issues

3.5 NOTIFICATION

3.5.1 Criteria of Notification

Initial notification of crisis level, SVP of affected Asset is required to notify the EVP of affected Asset required as soon as possible after the affected Asset becoming aware of the emergency.



If the event of the emergency is escalated to crisis in **rating 4 and 5** (as shown in Appendix A: PTTEP Risk Assessment Matrix), the SVP of affected Asset must notify the EVP of the affected Asset immediately. The EVP of affected Asset will then inform the CMT Leader.

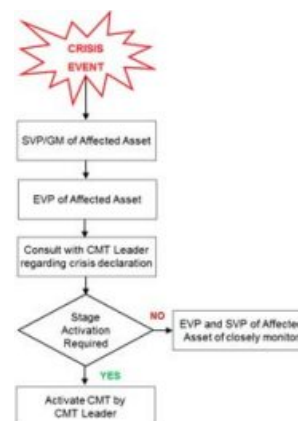


Figure 2: Flow Chart of Crisis Notification

3.5.2 Notification Requirement for Affected Asset

The initial notification will be to:

- The SVP will inform the EVP of affected Asset.
- The EVP of affected Asset will then consult with CMT Leader to consider the stages of activation.
- The person who is making the notification should include as a minimum, the following basic information:
 - Name of person making the initial notification;
 - Name of affected Asset;
 - Nature of the emergency (Fire, Spill, etc.);
 - Location (facility name, vessel name, etc.);
 - Date and Time that emergency occurred;



- Any other immediate details (e.g. action taken); and
- Name and contact number of local representative who can provide additional information on the emergency.

Other important details relating to the emergency, and any specific needs required, should be provided by the affected Asset and given to the CMT members, who may if necessary; return the information to designated representatives at the affected location.

3.5.3 Ensure Notification to Key Stakeholders and Joint Venture (JV) Partners

If an emergency occurs at a PTTEP Asset and escalates to a crisis which may affect key stakeholder and JV, PTTEP CMT should ensure that they are notified of the crisis by contacting their designated representatives.

3.6 ACTIVATION OF CRISIS

- Upon receipt of notification from the affected Asset, and the affected Asset SVP will inform the EVP of the affected Asset.
- The EVP of affected Asset will consult with the CMT Leader in order to consider the stage of crisis activation.
- If, after consultation, it is agreed a crisis exists, the CMT Leader will declare the crisis, stating the stages of crisis as follows:

3.6.1 Stages of Activation

There are two stages of the crisis activation as follows:

1) Partial Activation

The CMT Leader will declare Partial Activation when at crisis impact rating 4 or 5 (Appendix A: PTTEP Risk Assessment Matrix) and the affected Asset needs more resources to support, assistant or coordinate with CMT. Relevant CMT members and Technical Support Representatives will be notified of the decision to go to a Partial Activation. The Crisis Management Room (CMR) may be activated at the discretion of CMT Leader.

Personnel

- CMT leader
- Some EVP as required
- Some technical support as required

Function

- Develop Crisis Response plans/ actions
- Prepare for compilation of Press release
- Ensure teams are continued to be briefed on current situations



- Consider mobilization of Support Team(s) for affected Asset
- Set-up CMR at the discretion of CMT Leader
- Provide recovery support for affected Asset

2) Full-scale Activation

This level of activation will be declared when the crisis is rate 5 (Appendix A: PTTEP Risk Assessment Matrix) in response to major emergency of affected Asset, under this level the affected Asset will need assistance, support, and coordination from CMT members. It is likely that International media attention will be directed at the affected Asset or PTTEP Head Office in Bangkok or other PTTEP Assets Subsidiary. All core CMT members and Technical Representative will be located and informed of the decision to Full-scale Activation.

Personnel

- All core CMT members
- Some technical support as required

Function

- Set up CMR or continuation from Partial Activation to serve as the primary centre for communication with the affected Asset and CMT members
- Provide direct support functions
- Develop Crisis Response plans/ actions
- Prepare for compilation of Press release
- Ensure teams are continued to be briefed on current situations
- Consider mobilization of Support Team(s) for affected Asset
- Provide recovery support for affected Asset

3.7 DEACTIVATION OF CRISIS

This section describes the actions that to be performed subsequence to crisis management response which is included deactivation of CMT, resume of normal operation and performance critiques of crisis response.

3.7.1 Deactivation

The deactivation of crisis is at CMT Leader's discretion. The decision of deactivation will be made based upon determination of affected Asset that the affected Asset can bring the emergency under control and assistance and support at CMT is no longer critical.

After deactivation has occurred, some CMT members may continue, e.g. Technical Specialists may remain on site, or may remain in contact to provide specific expertise if required for resumption of normal operations.



3.7.2 Recovery

The affected Asset is responsible for repairing equipment, reconstructing units, replenishing supplies, cleaning up spilled materials as required in order to return to normal operations as soon as possible. The CMT will provide specific assistance as requested by affected Asset, such as participation with investigation team or as deemed necessary by the CMT Leader.

3.7.3 Response Critique

Upon deactivation of the crisis, the CMT Leader will call CMT members involved, for a critique meeting to discuss the response actions of the crisis and assist in identification of areas of potential improvement to the CMP, or related issues such as revising the plan, communication of lesson learnt and potential additional training requirements.

3.8 CRISIS MANAGEMENT ROOM (CMR)

CMR is located in the room no. 3424, on the 34th floor of PTTEP Bangkok Head Office.

3.9 CRISIS MANAGEMENT PLAN (CMP) MAINTENANCE

In order to maintain an effective crisis management preparedness program, the CMP should be reviewed and revised on regular basis, and drills and exercises conducted periodically. To maintain CMP effectiveness;

- A CMP review shall be conducted after a Partial Activation or Full-scale Activation.
- The CMT Leader should ensure that the CMP is reviewed and revised annually or when there is a significant change.
- Periodically conduct CMP and CMT drills and exercises to ensure that an adequate state of readiness exists.
- Full-scale exercises shall be conducted on a yearly basis.
- Training of the CMT must be carried out for all CMT members after the CMP has been approved, and refresher training to be performed.
- New members of the CMT must be trained prior to taking up a position in the CMT.



APPENDICES

APPENDIX A: PTTEP RISK ASSESSMENT MATRIX

Risk Rating	Asset	Risk Category	Risk Level	Risk Description	Risk Mitigation	Risk Assessment	Risk Rating	Risk Category	Risk Level	Risk Description	Risk Mitigation	Risk Assessment	Risk Rating	Risk Category	Risk Level	Risk Description	Risk Mitigation	Risk Assessment	Risk Rating	Risk Category	Risk Level	Risk Description	Risk Mitigation	Risk Assessment
High	Asset	High	High	High	High	High	High	Asset	High	High	High	High	High	Asset	High	High	High	High	High	Asset	High	High	High	High
Medium	Asset	Medium	Medium	Medium	Medium	Medium	Medium	Asset	Medium	Medium	Medium	Medium	Medium	Asset	Medium	Medium	Medium	Medium	Medium	Asset	Medium	Medium	Medium	Medium
Low	Asset	Low	Low	Low	Low	Low	Low	Asset	Low	Low	Low	Low	Low	Asset	Low	Low	Low	Low	Low	Asset	Low	Low	Low	Low

The original file of Risk Assessment Matrix can be found on SSHE Intranet ([SSHE Intranet > SSHE MS > SSHE MS Documents > Corporate Tools > Appendix: SSHE Risk Management Standard](#)).



ROLES AND RESPONSIBILITIES

Roles	Responsibilities
Document Owner	The owner of the Procedure is VP, Safety Operations Department with responsibilities for: <ul style="list-style-type: none">■ Approval and issuance of the Procedure and its revisions.■ Ensuring effective implementation of the Procedure.
Document Custodian	The custodian of the Procedure is Manager, Security Section, with responsibilities for: <ul style="list-style-type: none">■ Identifying deficiencies or potential improvement;■ Initial periodic revision; and■ Maintaining revision history and document status register.
Crisis Management Team Member	See Section 3.4



DEFINITION AND ACRONYMS

Set out below are common specific terms presented in alphabetical order:

Term	Definition
Asset	Refers to an operating Asset, site, or location within a respective Function Group.
Corporate	Refers to the PTTEP business groups hierarchically above Asset level, and located in the PTTEP headquarters, Bangkok.
Crisis	A major or catastrophic event (out of control emergency). A crisis could result in sustained national impacts over a prolonged period of time; almost immediately exceeds resources normally available to the company, local authorities and country in the impacted area; and significantly interrupts governmental operations and emergency services to such an extent that national security could be threatened. Crisis may challenge the ability and capacity of communities, company and country to achieve a timely recovery. Crisis situations include terrorism that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, company reputation, national morale, and/or government functions. In PTTEP crisis situation is treated by a tier 3 response level .
Crisis Management Team (CMT) Leader	The President and Chief Executive Officer (CEO) of the Company who has the top authority to overall manage a group/Company impact related to any crisis situations. He has the authority to activate Corporate Crisis Management Team (CMT) and work closely with Asset Crisis Management Team (CMT) and Asset Emergency Management Team (EMT).
Department	A subgroup within a Function Group, Division or Asset.
Division	A business group may have one or more distinct groups within its hierarchy. These are referred to as Divisions.
Emergency	An occurrence or event, natural or human caused, that requires an emergency response under determination of affected Asset Senior Vice President (SVP) to protect life, property and environment. The external assistance may or may not be needed to supplement the Company efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a major or catastrophe in any part of the Company premises.



Term	Definition
Emergency (continued)	Emergency situations can, for example, include major disasters, emergencies, terrorist attacks, terrorist threats, fires, floods, oil and hazardous material spills, marine vessel and aircraft accidents, earthquakes, tropical storms, typhoon, war-related disasters, outbreak of diseases and medical emergencies, and etc. In PTTEP emergency situations can be evaluated and treated by using a tier 1 – 2 response level .
Emergency Management Team (EMT) Leader	Affected Asset's SVP or authorized person, who has overall authority and responsibility for supporting and providing tactical activities and action plans to the On Scene Commander (OSC), including the development of strategic objectives. Incident Commander also sets priorities and defines organization of the Emergency Management Team (EMT) and the overall action plans for the particular response. He/she has to work closely with Asset EMT.
Function Group	Refers to a corporate level business group. These may have associated Divisions, Departments, or operational Assets within their hierarchy.
On Scene Commander (OSC)	An individual responsible for all onsite responses, especially providing direction and onsite tactical operations and always retains the authority to determine the appropriate course of response actions. The operational sites/fields are as example, Bongkot, Arthit, S1, PSB, Sham, and etc. OSC shall be a Vice President (VP), field or the top authorized person at that site/ field who has the authority to activate the onsite Emergency Response Team (ERT).

Acronyms	Description
CCT	Crisis Communication Team
CEO	President and Chief Executive Officer
CMP	Crisis Management Plan
CMR	Crisis Management Room
CMT	Crisis Management Team
COO	Chief Operating Officer
CPA	Process Safety and Assurance Department
CSA	Safety Management Department



Acronyms	Description
CSA/S	Security Section
CSH	Safety, Security, Health and Environment Division
EMP	Emergency Management Plan
EMT	Emergency Management Team
ERP	Emergency Response Plan
ERT	Emergency Response Team
GM	General Manager
JV	Joint Venture
OSC	On Scene Commander
PCRC	PTTEP Core Research Center
PSB	Petroleum Development Support Base
RRT	Relative Response Team



REFERENCES

Document Code	Document Title
PTTEP SSHE Controlling Documents	
11038-STD-SSHE-000	SSHE Management System
11038-STD-SSHE-401	SSHE Risk Assessment Standard
11038-STD-SSHE-501	Emergency and Crisis Management Standard
11003-STD-SSHE-590-005	Chemical Management Standard
11038-STD-SSHE-600-011	Incident Management Standard
12146-PDR-SSHE-501/03	Spill Management Plan
12056-PDR-031	Relative Response Plan
SSHE-106-PDR-502	Emergency Management Plan
11003-GDL-SSHE-501-003	Medical Emergency Management Guideline
Other Reference Documents	
12145-GDL-004-R02	Crisis Communication Guideline
-	National Disaster Prevention and Mitigation Plan (แผนป้องกันและบรรเทาสาธารณภัยแห่งชาติ)
-	National Oil Spill Prevention and Response Plan (แผนป้องกันและขจัดมลพิษเืองจากน้ำมันแห่งชาติ)
P-ปตท.-1111	PTT Group Emergency & Crisis Management Plan



REVISION HISTORY

Rev.	Description of Revision
0	Authorized by: PSH Security, Date: April 2008 New
1	Authorized by: CSH, Date: August 2011 <ul style="list-style-type: none">Revised to reflect organization change.Changed the definition of an emergency and crisis.Changed the expanded PTTEP Organization structure of emergency and crisis management.
2	Authorized by: TSH, Date: May 2016 <ul style="list-style-type: none">Revised to reflect organization change.Reviewed roles and responsibilities of CMT.Updated Risk Assessment Matrix.
3	Authorized by: CSH, Date: March 2019 <ul style="list-style-type: none">Revised the positions and duty functions to reflect current organization.Revised CMT's roles and responsibilities.



PTT Exploration and Production Public Company Limited

Medical Emergency Management Guideline

Document Code: 11003-GDL-SSHE-501-003-R02

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Medical Emergency Management Guideline

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THIS DOCUMENT WILL BE REVIEWED EVERY 5 YEARS FROM DATE OF APPROVAL OR REVISED EARLIER IF NECESSARY.



Revision History			
Rev.	Description of Revision	Authorized by	Date
0	New document	PEP	Aug 2005
1	Change from previous are as follows: <ul style="list-style-type: none">Changed Medical Emergency Management document from Standard to Guideline.Revised and re-arranged in each topic.Moved "Resources required" and added some information from "Resources required" in topic "Competencies and responsibilities".Moved "Basic Life Support (BLS)" to Appendix 1 Medical emergency training course and added Advanced Life Support (ALS) training course.Moved topic "Risk Assessment" and added information in topic "The number of medical emergency response personnel".Added detail of Ambulances, Air evacuation and Marine evacuation in "Transportation (Medevac)" topic.Added "Suggested Medical Emergency Response Plan (MERP)" in Appendix 3.Updated Telephone numbers of International Medical Assistant Vendor Alarm Centers (ISOS).	CSH	Dec 2011
2	Change from previous version are as follows: <ul style="list-style-type: none">Reformat the document based on the latest organization change.Added more content in the 6.7 Medical Response to Major Incident.Defined "Triage".Replace "Mass Casualty" with "Major Incident".Added the Intensive First Aiders requirement in table 2.	TSH	Dec 2016

Revision History			
Rev.	Description of Revision	Authorized by	Date
	<ul style="list-style-type: none"> Changed "First Aider" to "Intensive First Aider" in 6.2.3.1 B. and change the training requirement from internal to external. Added Appendix D: Check-list responsibilities associated with Medical Response in Major Incidents. 		

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PTT Exploration and Production Public Company Limited

SINPHUHORM FIELD
(PSH/F)

Emergency Response Plan

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Emergency Response Plan

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0	Revised from Hess to be complied and in line with PTTEP Safe Work Practice for Breaking of Containment	VP	Jun 2016
1	Revised RAM to align with corporate procedure	VP	Jan 2017
2	Change contact numbers of Sinphuhorm	VP	May 2017
3	Add Appendix D Pre_Incident Scenarios	VP	Oct 2017



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