Greater East Spar Commissioning Flushing Operations BD Summary
GE-35-RI-10006.02

PROJECT / FACILITY	Varanus Island Hub	
REVIEW INTERVAL (MONTHS)	N/a	
SAFETY CRITICAL DOCUMENT	~~YES~~	NO

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REVISION HISTORY

Revision	Author / Editor	Amendment
0	LM	Issued to DMIRS

CONTENTS

1. INTRODUCTION

Quadrant Oil Australia Pty Ltd (QOA) is the registered operator of the Greater East Spar (GES) and existing Halyard Facilities, located approximately 49 km from Barrow Island and 116 km from the town of Onslow Western Australia. QOA is a 100% owned subsidiary of Quadrant Energy Australia Ltd (Quadrant). Quadrant proposes to develop the GES project using a subsea tie-back to link the Spar-2 XT into the existing Halyard subsea facility and the Varanus Island (VI) onshore processing facility. Chemical injection and hydraulic and electrical power will be provided via the John Brookes Wellhead Platform.

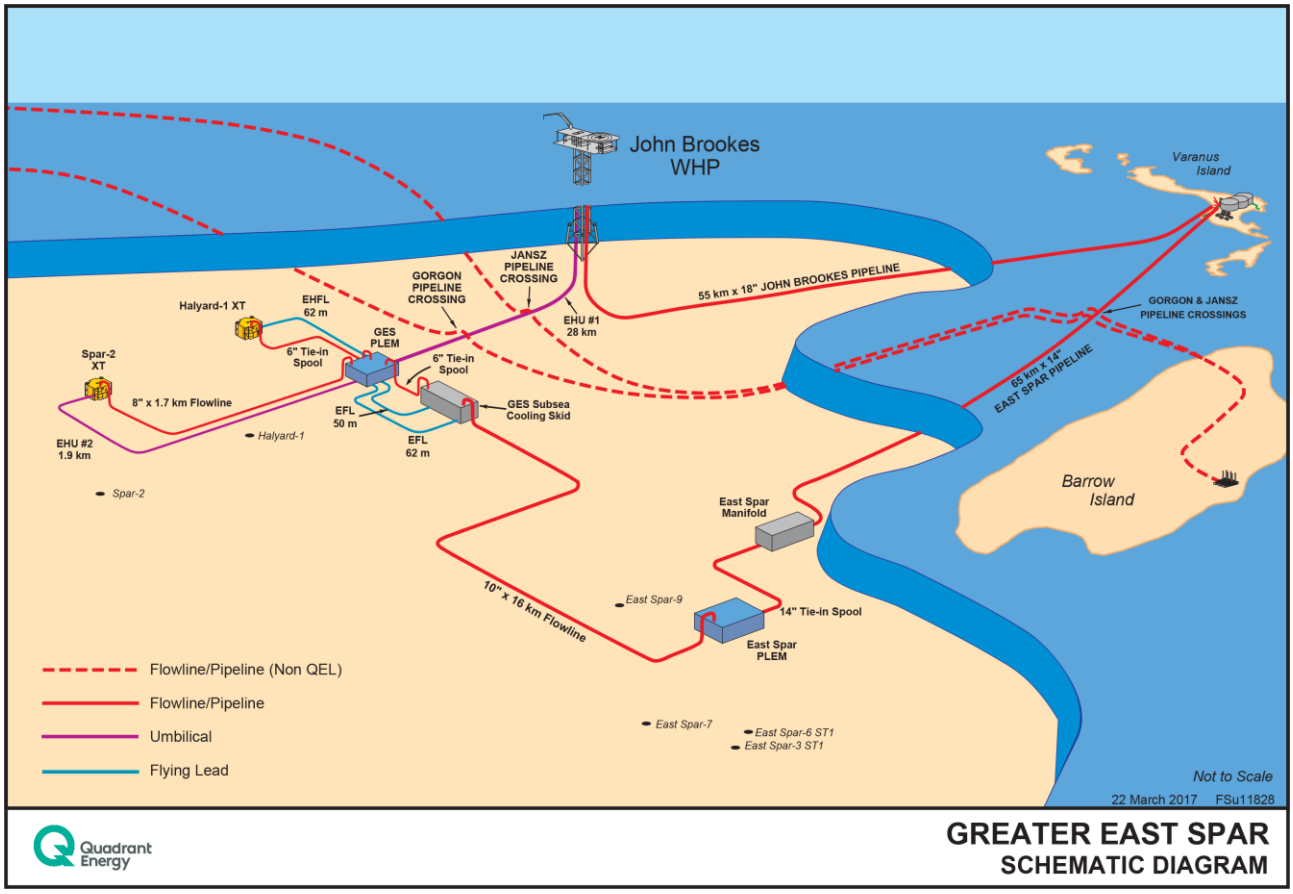

Figure 1-1: Greater East Spar Schematic

The installation and commissioning activity will occur wholly within Commonwealth waters and will occur under the *Greater East Spar Installation and Commissioning Environment Plan* (EP) (GE-35-RI-10002.01) accepted by NOPSEMA on 29th June 2017. However, the treated seawater and chemicals used to flush the new and existing infrastructure will be pushed through to VI through State waters pipeline and processed at VI for disposal through deep injection wells. These State water activities are covered under the Varanus Island Hub Operations Environment Plan (VI Hub Ops EP) (EA-60-RI-186), Revision 6 accepted by DMIRS (Department of Mines, Industry Regulation and Safety, formerly DMP) on 25 September 2014.

1.1 Compliance

The *Greater East Spar Commissioning Flushing Operations* BD (GE-35-RI-10006) was prepared to meet the requirements of Regulation 11(1) of the Petroleum (Submerged Lands) (Environment) Regulations 2012 (P(SL)(E) Regulations). The flushing activities will be conducted in accordance with all applicable legislation and regulations and specifically to meet the requirements of the Petroleum (Submerged Lands) Act 1982 (WA) and its regulations.

The proposed flushing activity will be managed in accordance with the accepted *Varanus Island Hub Operations Environment Plan* (EA-60-RI-186) and the *Greater East Spar Commissioning Flushing Operations* BD (GE-35-RI-10006) as they cover the expected environmental risks and control measures to be undertaken.

2. LOCATION

The operational area in the EP for the VI hub operations includes areas within 250m from pipelines, 500 m from platforms and subsea infrastructure and 500m from Varanus and Airlie Islands. VI is part of the Lowendal group of islands located on the North West Shelf of Western Australia in the Shire of Ashburton, off the Pilbara Coast. The John Brookes field in Commonwealth waters is in production licence WA-29-L, VI is in production licence TL/1. **Figure 2-1** shows the location of the Greater East Spar operational area in Commonwealth waters, all fluids will be flushed back to VI.

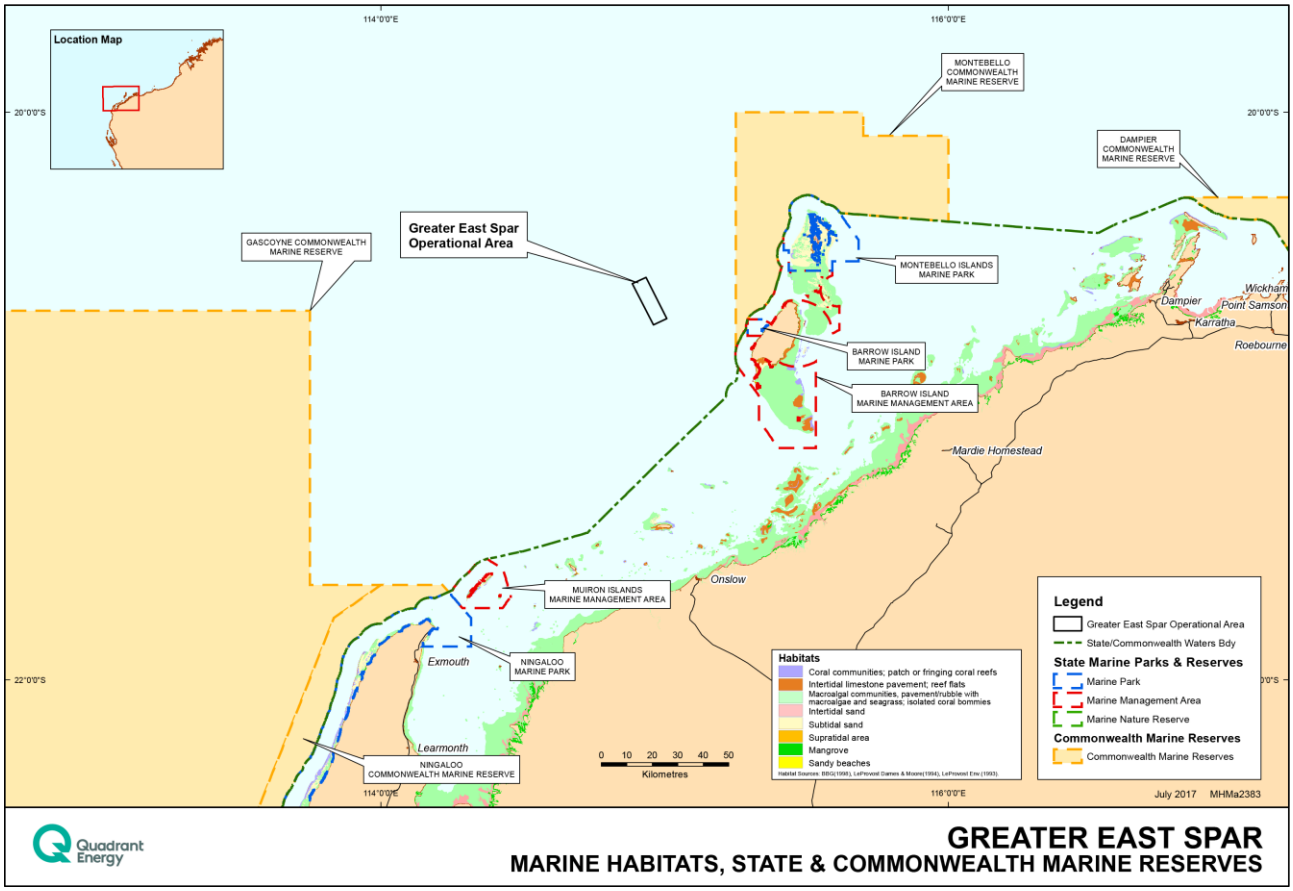

Figure 2-1: Greater East Spar Operational Area Location

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Physical and biological environment

VI is located in the North-West Marine Region (DEWHA, 2008) which lies primarily on the continental shelf between North West Cape and Cape Bougainville. The area has a dynamic oceanographic environment, influenced by strong tides, cyclonic storms, long-period swell and internal tides. Regional surveys on the NWS indicate the seafloor composition is uniform throughout the area, but with spatial variation in the grain size and origin of the surface sediments. Regionally, the seafloor tends to be flat, unconsolidated and sedimentary with occasional calcarenite rock outcrops.

3.1 Potential environmental impacts

Given that the disposal of treated seawater will be into depleted oil/gas reservoirs via injection wells, there are no expected environmental or socio-economic impacts identified for this process. No discharges to State waters will occur during this activity.

4. ACTIVITY DESCRIPTION

4.1 Activity

Chemicals used during the GES flushing and pre-commissioning activities will be pushed through into the East Spar pipeline, and when start-up commences, these chemicals will be pushed through to VI for disposal. The chemicals are required at various stages of the GES activity.

There will be no planned discharges of production fluids and/or chemically treated seawater to the marine environment.

4.2 Schedule

Start-up of GES is scheduled to commence on 15th September at the earliest. At this stage the fluids will be flushed to the produced water retention tanks on VI. This timeframe is dependent on the GES activities occurring in offshore Commonwealth waters and may be delayed. The flushing activity will be completed by 31st December 2017.

5. CHEMICAL DISCLOSURE

The volume of treated water and chemicals disposed of will be up to 3309 m^3. Upon returning the fluids to VI, the flushed liquids will be temporarily stored in the produced water storage tanks (Tank T201 or T202) to separate any residual hydrocarbons prior to injection downhole via the Corrugated Plate Interceptor (CPI).
The chemicals to be flushed and the maximum allowable volumes are provided in **Table 5-1** below, some contingency has been allowed for. Full chemical disclosure is provided in **Appendix *A***. The most recent Safety Data Sheet (SDS) for the chemicals are included in **Appendix B**.

Table 5-1: Maximum allowable Chemicals to be disposed of downhole

Chemical	Maximum allowable volume (m^3)
MEG 70:30	44.2
Hydrosure O-3670-R	0.0456
Fluorescein Dye	0.0057
CRW24830	2.499615
HDW24106	0.2
CLW3060A	80
Seawater	3182
Total	**3309**

Upon returning the fluids to VI, the acid mix will be mixed with produced water fluid prior to re-injection down hole. All chemicals have been accurately disclosed in **Appendix A**.

6. ENVIRONMENTAL MANAGEMENT

GES flushing activities will be managed under Quadrant's safety management system and the VI Hub Operations EP (EA-60-RI-186) Revision 6.

The proposed activities are not considered a significant modification to the operational details described within the VI Hub Operations EP (EA-60-RI-186) Revision 6 as they pose no significant new risks or significant increase in existing risks.

The VI Hub OEP describes the systems, practices and procedures that will be followed to avoid or reduce to ALARP the identified environmental risks and impacts of activities. These are considered to adequately describe the overall implementation strategy for the activities described in this BD.

In the unlikely event that a chemical or hydrocarbon spill occurs during activities, Quadrant Energy's emergency response procedures are in place to cover such an occurrence. These include:

- Varanus Island Hub Operations Oil Spill Contingency Plan (OSCP; EA-60-RI-00186.2);
- Incident Command and Management Manual (QE-00-ZF-00025);
- Varanus Island Hub Incident response plan (QE-00-ZF-00044);
- Varanus Island Fire and Petroleum Spillage Management Plan (AE-91-RI-10001);
- VI Hub Safety Case Part II – Facilities Description (AE-91-RF-010); and
- Emergency response reported as per the Incident Reporting and Investigation Procedure (QE-91-IF-00002).

7. STAKEHOLDER CONSULTATION

Stakeholders are regularly updated on activities at the VI Hub through Quadrant's Quarterly Consultation Updates. These regular, non-project oriented updates detail Quadrant's ongoing and proposed activities on the NWS, looking out three to six months, including operating facilities. Information provided in this way is intended to afford stakeholders an opportunity to request additional information on specific activities or elements that may be of interest to them, and voice any concerns. Should stakeholders request additional information this can then be incorporated into the relevant documentation, and dialogue with Quadrant can continue should the concerns or issues require further consultation.

No additional consultation was undertaken for this BD as the activities are not significantly different from Quadrant's day to day activities on VI.

8. CONTACT DETAILS

Further information about the flushing activities can be obtained from Ashlee Crabbe on (08) 6218 7100 or email Consultation@quadrantenergy.com.au.

Appendix A – Chemical Disclosure

A. SYSTEM DETAILS

OPERATOR:	Quadrant Energy
PROJECT / WELL:	Greater East Spar
SYSTEM:	Flow-line flushing chemicals
TOTAL VOLUME OF SYSTEM:	3309 m^3

B. PRODUCT LIST

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
Water	Not applicable	Flushing fluid	96.16%	N/A – as per components below	N/A
CLW3060A	Baker Hughes	Pipeline cleaner	2.42%	Acute Mammalian Toxicity *Component 1 (30-60% concentration)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (10-30% concentration)* No scientific data or research is available for this component. Data are presented for a similar ingredient. Specie: Rat LD50 (oral): 4290 mg/kg *Component 3 (10-30% concentration)* Specie: Rat LD50 (oral): >2528 mg/kg *Component 4 (1-5% concentration)* No scientific data or research is available for this component. Data are presented for a similar ingredient. Specie: Rat LD50 (oral): 2440 mg/kg *Component 5 (1-5 concentration)* No scientific data or research is available for this component. Data are presented for a similar ingredient. Specie: Rat LD50 (oral): 1470 mg/kg	Yes

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Aquatic Toxicity *Component 1 (30-60% concentration)* PLONOR *Component 2 (10-30% concentration)* Specie: *Pseudokirchneriella subcapita* (freshwater algae) EC50 72 hours: 12 mg/L Specie: *Daphnia magna* (freshwater invertebrate) LC50 48 hours: 1.8 mg/L Specie: *Lepomus macrochirus* (freshwater fish) LC50 96 hours: 5 mg/L *Component 3 (10-30% concentration)* Specie: *Pseudokirchneriella subcapita* (freshwater algae) EC50 72 hours: >1000 mg/L Specie: *Daphnia magna* (Freshwater invertebrate) LC50 48 hours: >1000 mg/L Specie: *Oncorhynchus mykiss* (Freshwater fish) LC50 96 Hours: >1000 mg/L *Component 4 (1-5% concentration)* No scientific data or research is available for this component. Data are presented for a similar ingredient. Specie: *Desmodedmus subspicatus* (freshwater algae) EC50 72 hours: >100 mg/L Specie: *Daphnia magna* (freshwater invertebrate) LC50 48 hours: >100 mg/L Specie: *Oncorhynchus mykiss* (freshwater fish) LC50 96 hours: >100 mg/L *Component 5 (1-5% concentration)* Specie: *Skeletonema costatum* (marine algae) EC50 72 hours: 0.85 mg/L Specie: *Acartia tonsa* (marine invertebrate) LC50 48 hours: 2.70 mg/L Chronic Toxicity No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects are associated with this product. Biodegradation / Bioaccumulation **Ready Biodegradability Test** *Component 1 (30-60% concentration)* PLONOR *Component 2 (10-30% concentration)*	

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Method: Die-away test. Biodegradability 28 days: 98% *Component 3 (10-30% concentration)* Method: OECD301D. Biodegradability 20 days: 95% *Component 4 (1-5% concentration)* Method: OECD306. Biodegradability 28 days: 41% **Octanol/Water Partition Coefficient** *Component 1 (30-60% concentration)* PLONOR *Component 2 (10-30% concentration)* Not applicable to surfactants *Component 3 (10-30% concentration)* Method: OECD 117 (HPLC). LogPow:-0.77 *Component 4 (1-5% concentration)* Not applicable to inorganic compounds. *Component 5 (1-5% concentration)* Method: OECD 117 (HPLC). Log $_{Pow}$:2.28	
Hydrosure O-3670R	NALCO Champion	Biocide	0.0014%	<u>Acute Mammalian Toxicity</u> Acute Toxicity Estimates calculated according to GHS using the data of the ingredients in the products. Oral toxicity estimate: 1500 mg/kg Inhalation toxicity estimate: 0.25 mg/L (4 hours) Dermal toxicity estimate: > 2000 mg/kg <u>Aquatic Toxicity</u> *Quaternary Ammonium Chloride* Specie: *Skeletonema costatum* (marine algae) EC50 72 hours: <1 mg/L Specie: *Acartia tonsa* (marine invertebrate) LC50 48 hours: <10 mg/L Specie: *Scophthalmus maximus* LC50 96 hours: <10 mg/L	Yes

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Acetic Acid LC50: 75 mg/L Fish PLONOR Substance *Dipropylene Glycol monomethyl ether* Specie: *Skeletonema costatum* (marine algae) NOEC: <1000 mg/L Specie: *Acartia tonsa* (marine invertebrate) LC50 48 hours: >10,000 mg/L Specie: *Scophthalmus maximus* LC50 96 hours: >10,000 mg/L *Ethanediol* LC50 (96 hours): 72 860 mg/L Fish NOEC (7 days): 15 380 mg/L Fish EC50 (48 hours): > 100 mg/L Crustacean NOEC (7 days): 8590 mg/L Crustacean EC50 (96 hours): 6500 mg/L Algae PLONOR Substance <u>Chronic Toxicity</u> No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects are associated with this product. <u>Biodegradation / Bioaccumulation</u> **Ready Biodegradation Test** *Quaternary Ammonium Chloride* Method: OECD306. Biodegradability 28 days: >20% *Acetic Acid* PLONOR Substance *Dipropylene Glycol monomethyl ether* Method: 301E. Biodegradability 28 days: >60% *Ethanediol* PLONOR Substance	

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Octanol/Water Partition Coefficient *Quaternary Ammonium Chloride* Method: OECD 117 (HPLC). Log_{Pow} <3 *Acetic Acid* PLONOR Substance *Dipropylene Glycol monomethyl ether* Method: OECD 117 (HPLC). Log_{Pow} <3 *Ethanediol* PLONOR Substance	
CRW24830	Baker Hughes	Corrosion Inhibitor	0.08%	Acute Mammalian Toxicity *Component 1 (30-60% concentration)* Natural component – exempted under Chemical Disclosure Guidelines *Component 2 (10-30% concentration)* No scientific data or research available for this component for this component *Component 3 (10-30% concentration)* PLONOR *Component 4 (5-10% concentration)* LD_{50} (oral) Rat 4500 mg/kg *Component 5 (5-10% concentration)* LD_{50} (oral) Rat 426 mg/kg *Component 6 (5-10% concentration)* PLONOR *Component 7 (<1% concentration)* LD_{50} (oral) Rat 6720 mg/kg Aquatic Toxicity *Component 1 (30-60% concentration)* Natural product – exempted under the Chemical Disclosure Guidelines	Yes

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Component 2 (10-30% concentration) EC50 (72 hours): 0.15 mg/L *Skeletonema costatum* LC50 (48 hours): 1.1 mg/L *Acartia tonsa* LC50 (96 hours): >0.1 mg/L *Cyprinodon variegatus* *Component 3 (10-30% concentration)* PLONOR *Component 4 (5-10% concentration)* EC50 (48 hours): 500-5000 mg/L *Skeletonema costatum* LC50 (48 hours): 2850 mg/L *Daphnia magna* LC50 (96 hours): 1300 mg/L *Lepomis macrochirus* *Component 5 (5-10% concentration)* No scientific data or research is available for an algal species LC50 (48 hours): 0.08 mg/L *Daphnia magna* LC50 (96 hours): 0.66 mg/L *Pimephales promelas* *Component 6 (5-10% concentration)* PLONOR *Component 7 (<1% concentration)* EC50 (48 hours): >10 mg/L *Chlorella sp.* LC50 (48 hours): 337 mg/L *Daphnia pulex* LC50 (96 hours): 423 mg/L *Scophthalmus maximus* <u>Chronic Toxicity</u> No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects, for any components in this product. <u>Biodegradation / Bioaccumulation</u> **Ready Biodegradability Test (seawater OECD 306)** *Component 1 (30-60% concentration)* Natural product – exempted under the Chemical Disclosure Guidelines	

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Component 2 (10-30% concentration) Biodegradability (28 days) 39% *Component 3 (10-30% concentration)* PLONOR *Component 4 (5-10% concentration)* Biodegradability (28 days) 75% *Component 5 (5-10% concentration)* No scientific data or research available for this component *Component 6 (5-10% concentration)* PLONOR substance *Component 7 (<1% concentration)* No scientific data or research is available for this component **Octanol/Water Partition Coefficient (OECD 117)** *Component 1 (30-60% concentration)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (10-30% concentration)* Non-bioaccumulative, molecular weight (MW) > 700 *Component 3 (10-30% concentration)* PLONOR *Component 4 (5-10% concentration)* Log Pow 0.2 *Component 5 (5-10% concentration)* Not applicable to surfactants *Component 6 (5-10% concentration)* PLONOR	

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Component 7 (<1% concentration) Log Pow 3.35	
MEG Water (70:30)	AIK MOH	Hydrate Inhibitor	1.34%	Aquatic Mammalian Toxicity *Ethanediol (60-100%)* OSPAR PLONOR Listed LD_{50} Dermal 9530 µL/kg LD_{50} Oral Rat 4700 mg/kg Chronic Toxicity No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects, for this product. Aquatic Toxicity *Ethanediol (60-100%)* OSPAR PLONOR Listed LC_{50} (96 hours) >18500 mg/L (*Oncorhynchus mykiss*) Biodegradation/Bioaccumulation *Ethanediol (60-100%)* OSPAR PLONOR Listed	Yes
Fluorescein Liquid Dye	NALCO Champion	Industrial liquid dye	0.0002%	Aquatic Mammalian Toxicity *Component 1 (30-60%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (1-5%)* LD50 Oral (Rat): > 2000 mg/kg *Component 3 (1-5%)* OSPAR PLONOR Listed Chronic Toxicity No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects, for this product. Aquatic Toxicity *Component 1 (30-60%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (5-10%)*	Yes

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				LC50 (72 hours) < 100 mg/L *Skeletonema costatum* LC50 (48 hours) < 100 mg/L *Acartia tonsa* LC50 (96 hours) < 100 mg/L *Scophthalmus maximus* LC50 (10 days) < 2000 mg/L *Corophuim sp.* *Component 3 (1-5%)* OSPAR PLONOR Listed <u>Biodegradation/Bioaccumulation</u> **Ready Biodegradability Test (seawater OECD 306)** *Component 1 (30-60%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (5-10%)* < 20% *Component 3 (1-5%)* OSPAR PLONOR Listed **Octanol/Water Partition Coefficient (OECD 117)** *Component 1 (30-60%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (5-10%)* Log Pow <3 *Component 3 (1-5%)* OSPAR PLONOR Listed	
HDW24106	Baker Hughes	Industrial liquid dye	0.006%	<u>Aquatic Mammalian Toxicity</u> *Component 1 (60-100%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (10-30%)* LD50 (oral): 4090 mg/kg (Rat)	Yes

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Component 3 (10-30%) LD50 (oral): > 4000 mg/kg <u>Chronic Toxicity</u> No known carcinogenic (H350, H351), chronic (H341, H370, H371, H373), mutagenic (H340) or reproductive (H360, H361, H362) effects for this product. <u>Aquatic Toxicity</u> *Component 1 (60-100%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (10-30%)* EC50 (48 hours): 500-800 mg/L *Pseudokirchneriella subcapitata* LC50 (48 hours): 200-227 mg/L *Ceriodaphnica sp.* LC50 (96 hours): 200 – 300 mg/L *Lepomis macrochirus* *Component 3 (10-30%)* EC50 (48 hours): 77 mg/L *Skeletonema costatum* LC50 (48 hours): 230-330 mg/L *Daphnia pulex* LC50 (96 hours): > 1000 mg/L *Oncorhynchus mykiss* <u>Biodegradation/Bioaccumulation</u> **Ready Biodegradability Test** *Component 1 (60-100%)* Natural product – exempted under the Chemical Disclosure Guidelines *Component 2 (10-30%)* Not applicable to inorganic compounds *Component 3 (10-30%)* Method: OECD 301D Biodegradability 28 days: < 10% **Octanol/Water Partition Coefficient** *Component 1 (60-100%)* Natural product – exempted under the Chemical Disclosure Guidelines	

Product Name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Information	MSDS Attached
				Component 2 (10-30%) Not applicable to inorganic compounds *Component 3 (10-30%)* Method: OECD 117 (HPLC) Log (Pow): < 10%	
Total			**~100%**		

C. Chemical List

Chemicals within Products in Part B	CAS number	Mass fraction (%)
WATER	7732-18-5	99.90
OXYALKYALTED ALKYLPHENOL	9016-45-9	0.00100
METHANOL	67-56-1	0.00100
COBALT SULPHATE	10124-43-3	0.00250
ALKYL BENZENESULFONIC ACID	68584-22-5	0.00250
BENZYL-(C12-C16 ALKYL)-DIMETHYL-AMMONIUM CHLORIDE	68424-85-1	0.01700
MONO ETHYLENE GLYCOL	107-21-1	0.01600
AMINE, N-TALLOW ALKYTRIMETHYLENEDI-,ETHOXYLATED	61790-85-0	0.01500
AMMONIUM BISULPHITE	10192-30-0	0.01500
2-(2-BUTOXYETHOXY)ETHANOL	112-34-5	0.01500
DIPROPYLENE GLYCOL MONOMETHYL ETHER	34590-94-8	0.00200
ACETIC ACID	64-19-7	0.00200
C.I. BASIC VIOLET (RHODAMINE B OR D&C ERD NO 19)	81-88-9	0.00200
FLUORESCEIN, DISODIUM SALT	518-47-8	0.00150
SODIUM CARBONATE	497-19-8	0.00095
Total		**~100%**

Appendix B – Chemical SDS

Material Safety Data Sheet

SurfSweep™ CLW3060 Pipeline Cleaner

1 . Identification of the material and supplier

Names

Product name : SurfSweep™ CLW3060 Pipeline Cleaner

Product code : CLW3060

ADG : FLAMMABLE LIQUID, N.O.S.(contains methanol)

Supplier : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

Uses

Material uses : Pipeline Cleaner

2 . Hazards identification

Classification : R10
T; R39/23/24/25
Xn; R20/21/22
Xi; R36/38
R52/53

Risk phrases : R10- Flammable.
R39/23/24/25- Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R36/38- Irritating to eyes and skin.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S36/37- Wear suitable protective clothing and gloves.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Statement of hazardous/ dangerous nature : HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
Oxyalkylated alkylphenol		10 - 30
methanol	67-56-1	10 - 30
Alkyl benzenesulfonic acid		1 - 5

Other ingredients, determined not to be hazardous according to Safe Work Australia criteria, and not dangerous according to the ADG Code, make up the product concentration to 100%.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Inhalation : Get medical attention immediately. Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Ingestion : Get medical attention immediately. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Obtain immediate medical attention after the following First Aid measures have been administered. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Obtain immediate medical attention after the following First Aid measures have been administered. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Advice to doctor : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Suitable : Use dry chemical, CO2, water spray (fog) or alcohol resistant foam

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. This material is harmful to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
phosphorus oxides
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazchem code : 3Y

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material.

6 . Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Exposure limits
methanol	**Safe Work Australia (Australia, 4/2013). Absorbed through skin.** STEL: 328 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 262 mg/m³ 8 hours. TWA: 200 ppm 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

8 . Exposure controls/personal protection

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Liquid.

Colour : Yellow.

Odour : Alcohol

Relative density : 1.032 (16°C)

Flash point : Closed cup: 33°C (91.4°F) [PMCC]

pH : 8 to 9

Solubility : Soluble in the following materials: cold water.

10 . Stability and reactivity

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Materials to avoid : Reactive or incompatible with the following materials:
oxidizing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

Inhalation : Harmful by inhalation. Danger of very serious irreversible effects.

Ingestion : Harmful if swallowed. Danger of very serious irreversible effects. Irritating to mouth, throat and stomach.

Skin contact : Harmful in contact with skin. Danger of very serious irreversible effects. Irritating to skin.

Eye contact : Irritating to eyes.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
methanol	LC50 Inhalation Vapour	Rat	128.2 mg/l	4 hours
	LD50 Dermal	Rabbit	17100 mg/kg	-
	LD50 Oral	Rat	>=2528 mg/kg	-
Alkyl benzenesulfonic acid	LD50 Dermal	Rabbit	2000 mg/kg	-
	LD50 Oral	Rat	775 mg/kg	-

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation

11 . Toxicological information

Oxyalkylated alkylphenol	Eyes - Severe irritant	Guinea pig	-	20 milligrams	-
	Eyes - Severe irritant	Mouse	-	20 milligrams	-
	Eyes - Severe irritant	Rabbit	-	20 milligrams	-
	Skin - Mild irritant	Human	-	72 hours 15 milligrams Intermittent	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
methanol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	40 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Inhalation : No specific data.

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : Adverse symptoms may include the following:
irritation
watering
redness

Target organs : Contains material which may cause damage to the following organs: liver, gastrointestinal tract, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

12 . Ecological information

Ecotoxicity : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
methanol	Acute EC50 10000 ppm Fresh water	Algae - Prorocentrum minimum	96 hours
	Acute EC50 >10000 mg/l Fresh water	Daphnia	48 hours
	Acute EC50 10000000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 15400 mg/l Fresh water	Fish	96 hours
	Acute LC50 100 mg/l Fresh water	Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
Alkyl benzenesulfonic acid	Acute EC50 5.65 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Neonate	48 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
methanol	-0.77	<10	low

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

Regulation	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADG	UN1993	FLAMMABLE LIQUID, N. O.S.(contains methanol)	3	III		**Hazchem code** 3Y
ADR	UN1993	FLAMMABLE LIQUID, N. O.S.(contains methanol)	3	III		**UK Hazchem:** 3Y
IMDG	UN1993	FLAMMABLE LIQUID, N. O.S.(contains methanol)	3	III		-
IATA	UN1993	FLAMMABLE LIQUID, N. O.S.(contains methanol)	3	III		-

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

6

Control of Scheduled Carcinogenic Substances

Ingredient name	Schedule
No listed substance	

Australia inventory (AICS) : All components are listed or exempted.

EU Classification : R10
T; R39/23/24/25
Xn; R20/21/22
Xi; R36/38
R52/53

Risk phrases : R10- Flammable.
R39/23/24/25- Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R36/38- Irritating to eyes and skin.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S36/37- Wear suitable protective clothing and gloves.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

National regulations : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

16 . Other information

Date of printing : 2 April 2014.

Date of issue/ Date of revision : 2 April 2014

Date of previous issue : No previous validation

Version : 1

Indicates information that has changed from previously issued version.

Disclaimer

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

CRW24830

1 . Identification of the material and supplier

Names

Product name : CRW24830

Product code : CRW24830

ADG : NOT REGULATED

Supplier : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

Uses

Material uses : Hydrotest corrosion inhibitor

2 . Hazards identification

Classification : Xn; R22
C; R34
N; R50/53

Risk phrases : R22- Harmful if swallowed.
R34- Causes burns.
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

Statement of hazardous/ dangerous nature : HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
Ethoxylated amines	-	10 - 30
Ammonium bisulphite	10192-30-0	10 - 30
2-(2-butoxyethoxy)ethanol	112-34-5	5 - 10
quaternary ammonium compounds, benzyl-C8-18-alkyldimethyl, chlorides	68424-85-1	5 - 10
ethanediol	107-21-1	5 - 10

Other ingredients, determined not to be hazardous according to Safe Work Australia criteria, and not dangerous according to the ADG Code, make up the product concentration to 100%.

3 . Composition/information on ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Inhalation : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion : Get medical attention immediately. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Obtain immediate medical attention after the following First Aid measures have been administered. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Advice to doctor : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5 . Fire-fighting measures

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Small spill : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Exposure limits
2-(2-butoxyethoxy)ethanol	**ACGIH TLV (United States, 6/2013).** TWA: 10 ppm 8 hours. Form: Inhalable fraction and vapor
ethanediol	**Safe Work Australia (Australia, 4/2013). Absorbed through skin.** TWA: 10 mg/m³ 8 hours. Form: Particulate STEL: 104 mg/m³ 15 minutes. Form: Vapor TWA: 52 mg/m³ 8 hours. Form: Vapor TWA: 20 ppm 8 hours. Form: Vapor STEL: 40 ppm 15 minutes. Form: Vapor

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

8 . Exposure controls/personal protection

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Liquid.

Colour : Brown.

Odour : Mild.

Relative density : 1.08 (20°C)

Flash point : Closed cup: Not applicable.

pH : 5 to 7

Solubility : Easily soluble in the following materials: cold water.

10 . Stability and reactivity

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid release to the environment. Refer to special instructions/safety data sheet.

Materials to avoid : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Skin contact : Corrosive to the skin. Causes burns.

Eye contact : Corrosive to eyes. Causes burns.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-(2-butoxyethoxy)ethanol	LD50 Dermal	Rabbit	2700 mg/kg	-
	LD50 Oral	Rat	4500 mg/kg	-
quaternary ammonium compounds, benzyl-C8-18-alkyldimethyl, chlorides	LD50 Oral	Rat	426 mg/kg	-
ethanediol	LC50 Inhalation Vapour	Rat	>2.5 mg/l	6 hours
	LD50 Dermal	Mouse	>3500 mg/kg	-

Conclusion/Summary : Not available.

11 . Toxicological information

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
2-(2-butoxyethoxy)ethanol	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Eyes - Severe irritant	Rabbit	-	20 milligrams	-
quaternary ammonium compounds, benzyl-C8-18-alkyldimethyl, chlorides	Skin - Severe irritant	Rabbit	-	25 milligrams	-
ethanediol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	1 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	6 hours 1440 milligrams	-
	Skin - Mild irritant	Rabbit	-	555 milligrams	-

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Inhalation : No specific data.

Ingestion : Adverse symptoms may include the following: stomach pains Irritation to digestive system

Skin : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Eyes : Adverse symptoms may include the following:
pain
watering
redness

Target organs : Contains material which may cause damage to the following organs: blood, kidneys, heart, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

12 . Ecological information

Ecotoxicity : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Ethoxylated amines	Acute EC50 1 to 10 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 1 to 10 mg/l	Fish	96 hours
2-(2-butoxyethoxy)ethanol	Acute LC50 1300000 ug/L Fresh water	Fish - Lepomis macrochirus - 33 to 75 mm	96 hours
ethanediol	Acute LC50 >18500 mg/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Ethoxylated amines	OECD	<60 % - Not readily - 28 days	-	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Ethoxylated amines	-	-	Not readily
quaternary ammonium compounds, benzyl-C8-18-alkyldimethyl, chlorides	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
2-(2-butoxyethoxy)ethanol	1	-	low
ethanediol	-1.36	-	low

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

Regulation	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADG	Not regulated.	NOT REGULATED	-	-		-
ADR	Not regulated.	NOT REGULATED	-	-		-
IMDG	Not regulated.	NOT REGULATED BY IMO	-	-		-
IATA	Not regulated.	NOT REGULATED BY IATA	-	-		-

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

5

Control of Scheduled Carcinogenic Substances

Ingredient name	Schedule
No listed substance	

Australia inventory (AICS) : All components are listed or exempted.

EU Classification : Xn; R22
C; R34
N; R50/53

Risk phrases : R22- Harmful if swallowed.
R34- Causes burns.
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

National regulations : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

16 . Other information

Date of printing : 13 April 2014.

Date of issue/ Date of revision : 13 April 2014

Date of previous issue : 5 December 2012

Version : 2

Indicates information that has changed from previously issued version.

Disclaimer

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Safety Data Sheet

HDW24106 FLUORESCEIN DYE

1 . Identification of the material and supplier

Product identifier : HDW24106 FLUORESCEIN DYE

Product code : HDW24106

ADG : -

Product type : Liquid.

Identified uses : Liquid Dye

Supplier's details : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2 . Hazards identification

Classification of the substance or mixture : SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1

GHS label elements

Hazard pictograms :

Signal word : DANGER

Hazard statements : H318 - Causes serious eye damage.

Precautionary statements

Prevention : Wear eye or face protection.

Response : IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTER or physician.

Storage : Not applicable.

Disposal : Not applicable.

Precautionary statements (Code) : P280, P305 + P351 + P310

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : Causes digestive tract burns.

3 . Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
sodium carbonate	10 - 30	497-19-8

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4 . First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Get medical attention if adverse health effects persist or are severe. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : Corrosive to the digestive tract. Causes burns.

Over-exposure signs/symptoms

Eye contact : pain,watering,redness

Inhalation : No specific data.

Skin contact : pain or irritation,redness,blistering may occur

Ingestion : stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4 . First aid measures

See toxicological information (Section 11)

5 . Firefighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,metal oxide/oxides

Hazchem code : -

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. Recommended: > 8 hours (breakthrough time): Rubber gloves. Nitrile gloves. Neoprene gloves.

8 . Exposure controls/personal protection

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

9 . Physical and chemical properties

Appearance

Physical state : Liquid.

Colour : Brown with a fluorescent tinge [Dark]

Odour : None.

Odour threshold : Not available.

pH : 9.5 [Conc. (% w/w): 100%]

Melting point : 0°C (32°F)

Boiling point : 100°C (212°F)

Flash point : Closed cup: Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

Relative density : 1.12 to 1.16 (20°C)

Solubility : Easily soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

10 . Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Not available.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium carbonate	LD50 Oral	Rat	4090 mg/kg	-

Conclusion/Summary : No known significant effects or critical hazards.

11 . Toxicological information

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
sodium carbonate	Eyes - Mild irritant	Rabbit	-	0.5 minutes 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Severe irritant	Rabbit	-	50 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Eyes : Risk of serious damage to eyes. May cause eye burns and permanent eye injury.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
sodium carbonate	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Not available.	

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : Corrosive to the digestive tract. Causes burns.

Symptoms related to the physical, chemical and toxicological characteristics

11 . Toxicological information

Eye contact : pain,watering,redness

Inhalation : No specific data.

Skin contact : pain or irritation,redness,blistering may occur

Ingestion : stomach pains

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : No known significant effects or critical hazards.

Product/ingredient name	Result	Species	Exposure
sodium carbonate	Acute EC50 242000 µg/l Fresh water Acute EC50 199.82 to 298.9 mg/l Fresh water Acute LC50 176000 µg/l Fresh water	Algae - Navicula seminulum Crustaceans - Ceriodaphnia dubia - Neonate Crustaceans - Amphipoda	96 hours 48 hours 48 hours

Persistence and degradability

Not available.

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

14 . Transport information

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	Not regulated.	-	-	-	
ADG	Not regulated.	-	-	-	
IMDG	Not regulated.	-	-	-	
IATA	Not regulated.	-	-	-	

PG* : Packing group

Regulatory information	Environmental hazards	Additional information
ADR/RID Class	No.	**Hazchem code** -
ADG Class	No.	**Hazchem code** -
IMDG Class	No.	-
IATA Class	No.	-

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

15 . Regulatory information

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

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Version : 2

Key to abbreviations : ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Eye Dam. 1, H318	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Disclaimer

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

NALCO Champion
An Ecolab Company

SAFETY DATA SHEET

Hydrosure™ O-3670R

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Hydrosure™ O-3670R
Other means of identification	:	Not applicable.
Recommended use	:	OXYGEN SCAVENGER, CORROSION INHIBITOR, HYDROTEST CHEMICAL
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	ECOLAB PTY LTD 2 Drake Avenue Macquarie Park NSW 2113 Australia A.B.N. 59 000 449 990 TEL: 1300 654 224 FAX: +61 2 8870 8680
Emergency telephone number	:	1800 205 506 International: +64 7 958 2372
Issuing date	:	09.06.2016

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral)	:	Category 4
Skin corrosion/irritation	:	Category 1B
Serious eye damage/eye irritation	:	Category 1

GHS Label element

Hazard pictograms :

Signal Word : Danger

Hazard Statements : Harmful if swallowed.
Causes severe skin burns and eye damage.

Precautionary Statements :

Prevention:
Do not breathe dusts or mists. Wash skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Wash contaminated clothing before reuse.

Storage:
Store locked up.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Other hazards : Do not mix with bleach or other chlorinated products – will cause chlorine gas. Contact with acids liberates toxic gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Chemical Name	CAS-No.	Concentration: (%)
Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	10 - 30
Dipropylene Glycol Monomethyl Ether	34590-94-8	1 - 5
Ethylene Glycol	107-21-1	1 - 5
Acetic Acid	64-19-7	1 - 5
C.I. Basic Violet 10 (Rhodamine B or D&C Red No 19)	81-88-9	1 - 5

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Contact the Poison's Information Centre (eg Australia 13 1126; New Zealand 0800 764 766).

If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention if symptoms occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : None known.

Specific hazards during firefighting : Not flammable or combustible.

Hazardous combustion products : Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides

Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Hazchem Code	:	2X

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Do not allow contact with soil, surface or ground water.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect 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). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation. Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labeled containers.
Suitable material	:	Keep in properly labelled containers.
Unsuitable material	:	not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Dipropylene Glycol Monomethyl Ether	34590-94-8	TWA	50 ppm 308 mg/m3	AU OEL
Dipropylene Glycol Monomethyl Ether	34590-94-8	WES-STEL	150 ppm 909 mg/m3	NZ OEL
		WES-TWA	100 ppm 606 mg/m3	NZ OEL
Dipropylene Glycol Monomethyl Ether	34590-94-8	TWA	100 ppm	ACGIH
		STEL	150 ppm	ACGIH
		STEL	150 ppm	NIOSH REL

			900 mg/m3	
		TWA	100 ppm 600 mg/m3	NIOSH REL
		TWA	100 ppm 600 mg/m3	OSHA Z1
Ethylene Glycol	107-21-1	TWA (Vapour.)	20 ppm 52 mg/m3	AU OEL
		VLE (Vapour.)	40 ppm 104 mg/m3	AU OEL
		TWA (Particulate.)	10 mg/m3	AU OEL
Ethylene Glycol	107-21-1	WES-Ceiling (Vapour and mist)	50 ppm 127 mg/m3	NZ OEL
Ethylene Glycol	107-21-1	Ceiling (Aerosol only)	100 mg/m3	ACGIH
Acetic Acid	64-19-7	VLE	15 ppm 37 mg/m3	AU OEL
		TWA	10 ppm 25 mg/m3	AU OEL
Acetic Acid	64-19-7	WES-TWA	10 ppm 25 mg/m3	NZ OEL
		WES-STEL	15 ppm 37 mg/m3	NZ OEL
Acetic Acid	64-19-7	TWA	10 ppm	ACGIH
		STEL	15 ppm	ACGIH
		STEL	15 ppm 37 mg/m3	NIOSH REL
		TWA	10 ppm 25 mg/m3	NIOSH REL
		TWA	10 ppm 25 mg/m3	OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles
Face-shield

Hand protection : Wear the following personal protective equipment:
Standard glove type.
Laminate film
Nitrile
Unsupported neoprene
PVC
Natural rubber
Neoprene/natural rubber blend
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove

and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	colourless
Odour	:	Pungent
Flash point	:	95 °C, Not applicable.
pH	:	4 - 6
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	Not applicable.
Evaporation rate	:	no data available
Flammability (solid, gas)	:	no data available
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	not determined
Relative vapour density	:	no data available
Relative density	:	1.045 - 1.075, (20 °C),
Density	:	no data available
Water solubility	:	completely miscible
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition temperature	:	no data available
Viscosity, dynamic	:	< 20 mPa.s (20 °C)
Viscosity, kinematic	:	10 mm2/s (40 °C)
Molecular weight	:	no data available
VOC	:	no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition	:	Decomposition products may include the following materials:

products	Carbon oxides nitrogen oxides (NOx) Sulphur oxides

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes : Causes serious eye damage.

Skin : Causes severe skin burns.

Ingestion : Harmful if swallowed. Causes digestive tract burns.

Inhalation : May cause nose, throat, and lung irritation.

Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : Redness, Pain, Corrosion

Skin contact : Redness, Pain, Corrosion

Ingestion : Corrosion, Abdominal pain

Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity	:	Acute toxicity estimate: 1,500 mg/kg
Acute inhalation toxicity	:	Acute toxicity estimate: 0.25 mg/l Exposure time: 4 h
Acute dermal toxicity	:	Acute toxicity estimate: > 2,000 mg/kg
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Reproductive effects	:	No toxicity to reproduction
Germ cell mutagenicity	:	Contains no ingredient listed as a mutagen
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	No aspiration toxicity classification

Human Hazard Characterization

Based on our hazard characterization, the potential human hazard is: High

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Product

Toxicity to fish : no data available

Toxicity to daphnia and other aquatic invertebrates : no data available

Toxicity to algae : no data available

Components

Toxicity to fish : Dipropylene Glycol Monomethyl Ether
LC50 Fish: > 1,000 mg/l
Exposure time: 96 h

Ethylene Glycol
LC50 : 72,860 mg/l
Exposure time: 96 h

Acetic Acid
LC50 : 75 mg/l
Exposure time: 96 h

Components

Toxicity to daphnia and other aquatic invertebrates : Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride
EC50 Daphnia magna (Water flea): 0.016 mg/l
Exposure time: 48 h

Ethylene Glycol
EC50 : > 100 mg/l
Exposure time: 48 h

Components

Toxicity to algae : Ethylene Glycol
EC50 : 6,500 mg/l
Exposure time: 96 h

Components

Toxicity to bacteria : Ethylene Glycol
> 1,995 mg/l

Components

Toxicity to fish (Chronic toxicity) : Ethylene Glycol
NOEC: 15,380 mg/l
Exposure time: 7 d

Components

Toxicity to daphnia and other : Ethylene Glycol

aquatic invertebrates (Chronic toxicity)	NOEC: 8,590 mg/l Exposure time: 7 d

Persistence and degradability

no data available

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods	:	The product should not be allowed to enter drains, water courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
Disposal considerations	:	Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport

Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical name(s):	:	Quaternary ammonium compound
UN/ID No.	:	UN 3265
Transport hazard class(es)	:	8
Packing group	:	II
Hazchem Code	:	2X

Air transport (IATA)

UN/ID No.	:	UN 3265
Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical name(s)	:	Quaternary ammonium compound
Transport hazard class(es)	:	8
Packing group	:	II

Sea transport (IMDG/IMO)

UN/ID No.	:	UN 3265

Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical name(s)	:	Quaternary ammonium compound
Transport hazard class(es)	:	8
Packing group	:	II
Marine pollutant	:	Quaternary ammonium compound

Section: 15. REGULATORY INFORMATION

Standard for the Uniform Scheduling of Medicines and Poisons : Schedule 6

INTERNATIONAL CHEMICAL CONTROL LAWS :

TOXIC SUBSTANCES CONTROL ACT (TSCA)
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND
All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996,and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

Section: 16. OTHER INFORMATION

REFERENCES

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Revision Date	:	09.06.2016
Date of first issue	:	09.06.2016
Version Number	:	1.0
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
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An Ecolab Company

SAFETY DATA SHEET

FLUORESCENT DYE LIQUID

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	FLUORESCENT DYE LIQUID
Other means of identification	:	Not applicable.
Recommended use	:	HYDROTEST CHEMICAL
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	ECOLAB PTY LTD 2 Drake Avenue Macquarie Park NSW 2113 Australia A.B.N. 59 000 449 990 TEL: 1300 654 224 FAX: +61 2 8870 8680
Emergency telephone number	:	1800 205 506 International: +64 7 958 2372
Issuing date	:	17.06.2016

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Skin corrosion/irritation	:	Category 2
Serious eye damage/eye irritation	:	Category 2A

GHS Label element

Hazard pictograms :

Signal Word	:	Warning
Hazard Statements	:	Causes skin irritation. Causes serious eye irritation.
Precautionary Statements	:	**Prevention:** Wash skin thoroughly after handling. Wear protective gloves/ eye protection/ face protection. **Response:** IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/ attention. Take off contaminated clothing and wash before reuse.
Other hazards	:	None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture	:	Mixture

Chemical Name	CAS-No.	Concentration: (%)
Fluorescein, Disodium Salt	518-47-8	10 - 30

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.
In case of skin contact	:	Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Get medical attention if irritation develops and persists.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur. Contact the Poison's Information Centre (eg Australia 13 1126; New Zealand 0800 764 766).
If inhaled	:	Get medical attention if symptoms occur.
Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Do not allow contact with soil, surface or ground water.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect 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). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	Avoid contact with skin and eyes. Wash hands thoroughly after handling.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labeled containers.
Suitable material	:	Keep in properly labelled containers.
Unsuitable material	:	not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Personal protective equipment

Eye protection	:	Safety glasses with side-shields
Hand protection	:	Wear the following personal protective equipment: Standard glove type. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.
Respiratory protection	:	No personal respiratory protective equipment normally required.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	dark, orange, to, brown
Odour	:	no data available
Flash point	:	> 100 °C, Method: Pensky-Martens closed cup
pH	:	9 - 10
Odour Threshold	:	no data available
Melting point/freezing point	:	pour point: 0 °C
Initial boiling point and boiling range	:	no data available
Evaporation rate	:	no data available

Flammability (solid, gas)	:	no data available
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Relative density	:	1.0 - 1.07, (25 °C),
Density	:	no data available
Water solubility	:	soluble
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition temperature	:	no data available
Viscosity, dynamic	:	< 5 mPa.s (25 °C)
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Causes serious eye irritation.
Skin	:	Causes skin irritation.
Ingestion	:	Health injuries are not known or expected under normal use.
Inhalation	:	Health injuries are not known or expected under normal use.

Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	Redness, Pain, Irritation
Skin contact	:	Redness, Irritation
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	no data available
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	no data available
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Reproductive effects	:	No reproductive toxic effects expected.
Germ cell mutagenicity	:	Contains no ingredient listed as a mutagen
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	No aspiration toxicity classification

Human Hazard Characterization

Based on our hazard characterization, the potential human hazard is: Moderate

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects	:	This product has no known ecotoxicological effects.

Product

Toxicity to fish	:	no data available
Toxicity to daphnia and other aquatic invertebrates	:	no data available
Toxicity to algae	:	no data available

Persistence and degradability

no data available

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods	:	Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
Disposal considerations	:	Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Air transport (IATA)

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

Standard for the Uniform Scheduling of Medicines and Poisons	:	No poison schedule number allocated

INTERNATIONAL CHEMICAL CONTROL LAWS :

TOXIC SUBSTANCES CONTROL ACT (TSCA)
not determined

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
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Effective Date: May 2017
REF NO.:AK17/1097/MEG 30%

MEG 30%

1. Chemical Product and Company Identification

Product Identification:
Mono Ethylene Glycol 30%

Chemicals Name:
Mono Ethylene Glycol 30%

Other Trade Name:
MEG 30%

Manufacturer/Supplier:
Aik Moh Paints & Chemicals Pte Ltd
20 TUAS STREET, SINGAPORE 638457
Tel : 6863 1993 Fax : 6863 8033
Website : www.aikmoh.com.sg

2. Hazards Identification

GHS Classification

Acute Toxicity (Oral)	4
Specific Target Organ Toxicity	2

GHS Label Elements

Signal words: Warning

Health hazards:
Hazard classification:
H302 - Harmful if swallowed
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary Statement(s):
Prevention
P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
P264 - Wash thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
Response
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 - Rinse mouth.
P314 - Get medical advice/attention if you feel unwell.

3. Composition Information on Ingredients

Components	CAS number	Percentage
Mono Ethylene Glycol	107-21- 1	30%
Deionised Water	7732-18-5	70 %

4. First-Aid Measures

Description of First Aid Measures:

General Advice

First Aid responders should pay attention to self -protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Eye Contact

Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact

Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated leather items such as shoes, belts, an d watchbands. Safety shower should be located in immediate work area.

Inhalation

Move person to fresh air; if effects occur, consult a physician.

Ingestion

Do not induce vomiting. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240 ml)of water. If medical advice is delayed and if an adult has swallowed several ounces ofchemical, then give 3-4 ounces (1/3-1/2 Cup) (90-120 ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounce (1 1/2 tsp.) (8 ml) liquor for each 10 pounds of body weight, or 2 ml per kg body weight [e.g., 1.2 ounce (2 1/3 tbsp.) for a 40 pound child or 36 ml for an 18 kg child].

Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed:

If several ounces (60 - 100 ml) of mono ethylene glycol 50% have been ingested, early administration of ethanol may counter the toxic effects (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis & thiamine 100 mg plus pyridoxine 50 mg intravenously every 6 hours. If ethanol is used, a therapeutically effective blood concentration in the range of 100 - 150 mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol®) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of mono ethylene glycol 50% (MEG 50%), di- or triethylene glycol (DEG, TEG) , ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol (Brent, J. et al., New England Journal of Medicine, Feb. 8, 2001, 34 4:6, p. 424-9): loading dose 15 mg/kg intravenously, follow by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15 mg/kg every 12 hours. Continue fomepizole until serum methanol, MEG, DEG, TEG or EGBE are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression , renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. In severe poisoning, respiratory support with mechanical ventilation and positive end expiratory pressure may be required. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable Extinguishing Media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Special hazards arising from substance or mixture

Hazardous Combustion Products : During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide. Nitrogen oxides.

Unusual Fire and Explosion Hazards

Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Advice for Firefighters:

Fire Fighting Procedures

Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the ar ea in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move

container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

Special Protective Equipment For Firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions :
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up:
Contain spilled material if possible. Collect in suitable and properly labeled containers.

Small spills :
Absorb with materials such as: Cat litter. Sand. Sawdust. Zorb-all®. Hazorb®.

Large spills :
Dike area to contain spill. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling:

General Handling :
Do not swallow. Avoid contact with eyes. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage : Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls/Personal Protection

Component	List	Type	Value
Mono Ethylene Glycol	ACGIH	Ceiling Aerosol	100 mg/m^3
	SG PEL	STEL	127 mg/m^3 50 ppm
	SG PEL		Listed

Personal Protection:

Eye/Face Protection :
Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin Protection :
Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. When handling hot material, protect skin from thermal burns as well as from skin absorption.

Hand Protection :
If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Use gloves with insulation for thermal protection, when needed. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/instructions/ specifications provided by the glove supplier.

Respiratory Protection :
Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion :
Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls:
Ventilation :
Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State : Liquid
Color : Colorless
Odor : Sweet
Odor Threshold : No test data available
Melting Point : Not applicable to liquids

MEG:
Solubility in Water (by weight) : 100 % Literature
Molecular Weight : 62 g/mol Literature
Molecular Formula : HOC2H4OHReactivity : No dangerous reaction known under conditions of normal use.
Chemical Stability : Thermally stable at recommended temperatures and pressures.

10. Stability and Reactivity

Reactivity :
No dangerous reaction known under conditions of normal use.

Chemical Stability :
Thermally stable at recommended temperatures and pressures.

Possibility of Hazardous Reactions :
Will not occur.

Conditions to Avoid :
Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials :
Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products :
Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers.

11. Toxicological Information

Acute Toxicity:
Ingestion :
Oral toxicity is expected to be moderate in humans due to Mono ethylene glycol even though tests with animals show a lower degree of toxicity. Ingestion of quantities (approximately 65 mL (2 oz.) for diethylene glycol or 100 mL (3 oz.) for mono ethylene glycol) has caused death in humans. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. For Ethylene glycol: Lethal Dose, Human, adult 100 ml LD50, Rat, male and female 7,712 mg/kg

Aspiration Hazard :
Based on physical properties, not likely to be an aspiration hazard.

Dermal :
Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potentially lethal amounts.
LD50, Rabbit > 10,600 mg/kg
LD50, Mouse, male and female > 3,500 mg/kg

Inhalation :
At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea.
LC50, 7 h, Aerosol, Rat > 3.95 mg/l
LC50, 6 h, Aerosol, Rat, male and female > 2.5 mg/l

Eye Damage/Eye Irritation :
May cause slight eye irritation. Corneal injury is unlikely. Vapor or mist may cause eye irritation.

Skin Corrosion/Irritation :
Brief contact is essentially nonirritating to skin. Prolonged contact may cause slight skin irritation with local redness. Repeated contact may cause skin irritation with local redness.

Sensitization:
Skin :
Did not cause allergic skin reactions when tested in guinea pigs.

Respiratory :
No relevant data found.

Repeated Dose Toxicity :
Observations in humans include: Nystagmus (involuntary eye movement). In animals, effects have been reported on the following organs: Kidney. Liver.

Chronic Toxicity and Carcinogenicity :
Ethylene glycol did not cause cancer in long-term animal studies.

Developmental Toxicity :
Based on animal studies, ingestion of very large amounts of Mono ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies.

Reproductive Toxicity :
Ingestion of large amounts of mono ethylene glycol has been shown to interfere with reproduction in animals.

Genetic Toxicology :
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. Ecological Information

Toxicity:
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 > 100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity :
LC50, rainbow trout (Oncorhynchus mykiss), static, 96 h: 18,000 - 46,000 mg/l

Aquatic Invertebrate Acute Toxicity :
EC50, water flea Daphnia magna, static, 48 h, immobilization: > 100 mg/l

Aquatic Plant Toxicity :
ErC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), Growth rate inhibition, 96 h: 6,500 - 13,000 mg/l

Toxicity to Micro-organisms :
EC50, OECD 209 Test; activated sludge, 30 min: 225 mg/l

Persistence and Degradability:
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

OECD Biodegradation Tests:

Biodegradation	Exposure time	Method	10 day window
90-100%	10 d	OECD 301A test	Pass
90%	1 d	OECD 302B test	Not appicable

Indirect Photodegradation with OH Radicals:

Rate constant	Atmospheric Half-life	Method
8.32E-12 cm^3/s	15 h	Estimated

Theoretical Oxygen Demand : 129 mg/mg

Bioaccumulative Potential:
Bioaccumulation :
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in Soil:
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process., Potential for mobility in soil is very high (Koc between 0 and 50).

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water	Biota	Soil	Sediment
0.03%	100%	0%	0%	0%

Results of PBT and vPvB Assessment :
No specific, relevant data available for assessment.

Other Adverse Effects :
No data available.

13. Disposal Considerations

Disposal Methods :
DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

14. Transport Information

ROAD & RAIL Non-Bulk
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized safes or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

European Inventory of Existing Commercial Chemical Substances (EINECS)
This product is on the EINECS inventory.

This product is classified as dangerous according to Singapore Standards, Factories Act and Regulations, Environmental Pollution Control Act and Regulations, Fire Safety Act and Regulations and Poisons Act.

Workplace Safety and Health Act & Workplace Safety and Health (General Provisions) Regulations
This product is subject to the SDS, labeling, PEL and other requirements in the Act/Regulations.

16. Other Information

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