



SUMMIT FSRT

TREATED WATER DISPOSAL PLAN

COMPANY DOCUMENT REVIEW

- Code 1 – Approved without comment
- Code 2 – Approved with minor comment / work may proceed
- Code 3 – Rejected with major comment / revise and resubmit
- Code 4 – document shall be cancelled or superseded

Reviewer name:
Signature:
Date:

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OTHER					

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1. INTRODUCTION

1.1 Project description

SUMMIT LNG TERMINAL CO. (PVT.) LTD. is developing a site off the coast of Maheshkhali island, Bangladesh for the construction of an offshore marine terminal to support continuous offshore re-gasification of liquefied natural gas for onward delivery to the onshore transfer location.

The design should take into account:

- Vessel berthing and mooring arrangements at an offshore marine terminal
- Proximity distances between vessels, shore side facilities, and equipment
- Re-gasification operation, control, and monitoring functions at the offshore marine terminal being provided by the company.
- LNG and boil off gas cargo transfer operation, control and monitoring functions being provided by the FSRU and LNGC operators.
- The offshore marine terminal connection and disconnection and periodic process inspections and maintenance activities will be provided by the operators who will visit marine terminal for these particular tasks.

GEOCEAN and MacGregor, as a consortium, are in charge of the complete design, procurement, construction and installation of the mooring system for the FSRU, and the offloading system to the shore. This system will include:

- A plug system, its mooring lines and anchors, and its submarine landing pad
- The FSRU stern mooring lines and anchors
- A flexible riser from plug to a submarine PLEM
- A submarine PLEM
- A submarine pipeline up to the shore
- An onshore manifold

1.2 Objective of the document

1.3 Change since last revision

None, first issue.

1.4 Definitions

COMPANY	SUMMIT LNG TERMINAL CO. (PVT.) LTD
CONTRACTOR	CONSORTIUM made of Geocean and MacGregor for the project, for which Geocean is the leader

1.5 Abbreviations

API	Anchor Handling Tug
B	American Petroleum Institute
BW	Beam
DB	Breakwater
DL	Draft Ballasted

DMA	Draft Loaded
DSV	Dead man anchor
DNV	Diving Support Vessel
DP	Det Norske Veritas
DWT	Dynamic Positioning
EPCI	Deadweight
FB	Engineering, Procurement, Construction, Installation
FL	Freeboard Ballasted
KP	Kilometric Point
LBP	Length Between Perpendicular
LOA	Length Overall
MBL	Minimum Breaking Load
MHWS	Mean High Water Spring
MSL	Mean Sea Level
MLWS	Mean Low Water Spring
N/A	Not Applicable
NDT	Non Destructive Test
OCIMF	Oil Companies International Maritime Forum
SWL	Safe Working Load
TDP	Touch Down Point
UHC	Ultimate Holding Capacity

1.6 System of units

The calculations for the all design, procurement, and installation activities use the System International (SI) system of units unless otherwise specified. Inches may however be used to quote line pipe and pipeline diameter.

2. REFERENCES

2.1 References of document issued by COMPANY

REF.	DOCUMENT REFERENCE	REVISION / DATE	DOCUMENT TITLE
[A1]	ESIA	APRIL 12, 2017	ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
[A2]	BAP	MAY 2017	BIODIVERSITY ACTION PLAN

2.2 References of document issued by GEOCEAN

REF.	DOCUMENT REFERENCE	REVISION / DATE	DOCUMENT TITLE
[B1]	466-GE-PPL-STD-5381	MAY 15, 2017	INSTALLATION ANALYSIS BASIS OF DESIGN
[B2]	466-GE-CMG-MS-4001	JUNE 15, 2017	PRE-COMMISSIONING METHOD STATEMENT
[B3]	466-GE-CMG-SPE-4330	JUNE 19, 2017	PRE-COMMISSIONING CHEMICALS SPECIFICATION & MTO

2.3 Codes and standards

REF.	DOCUMENT REFERENCE	REVISION / DATE	DOCUMENT TITLE
[C1]	IFC EHS GUIDELINES	JUNE 5, 2015	WORLD BANK EHS GUIDELINES FOR OFFSHORE OIL AND GAS DEVELOPMENT

3. SCOPE OF WORK

To confirm the pipeline and tie-in integrity, the full system (Riser, Offshore PLEM, Pipeline and Onshore PLEM) will be flooded, pigged, cleaned, gauged, hydrotested & dewatered. To preserve the system, additives will be added to the water: Corrosion Inhibitor, Biocide, Oxygen Scavenger, Dye and Mono Ethylene Glycol (MEG).

This Hydrotest Water Disposal Plan intends to detail activities of pre-commissioning as required by the World Bank EHS Guidelines for Offshore Oil and Gas development.

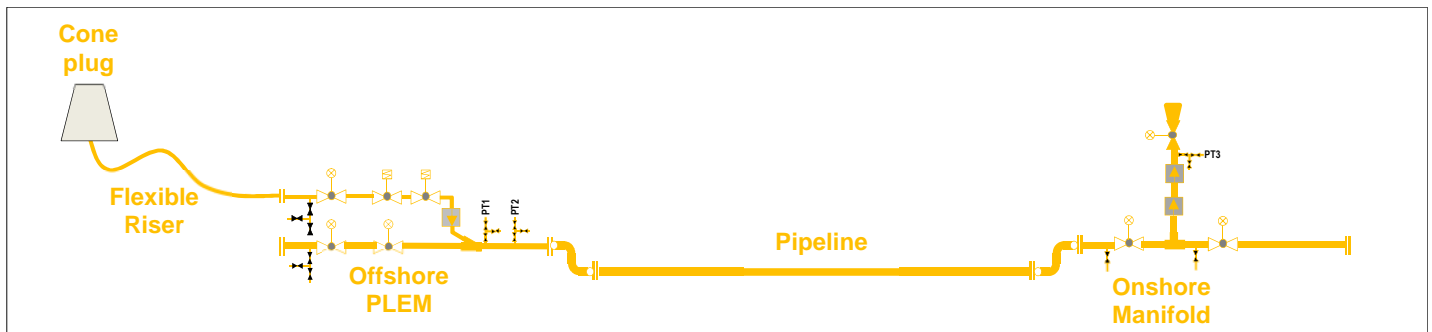


FIGURE 1: GAS EXPORT LINE

4. ADDITIVES SELECTION

The additives have been selected for their high qualities and minimum impact to environment. They are all “GOLD”-rated on CHARM list and known for their biodegradability and lack of hazardous impact on the environment (No ecotoxicity and no bio-accumulation). Here below details of additives used:

Corrosion inhibitor/Biocide/Oxygen Scavenger:
ROEMEX RX-5227

Mono Ethylene Glycol (MEG):
ROEMEX Ethylene Glycols

Dye:
ROEMEX RX-9022

MSDS are attached at the end of the document.

5. ADDITIVES VOLUMES

The concentrations have been defined as per the time that test waters remain in the system. The quantities listed in the table below are the maximum volumes expected to be used during the pre-commissioning activity. Installation Contractor aims at minimizing the concentration of additives by reducing the flooded condition of the pipeline.

The figures presented in table 1 are conservative. The concentration during Flooding will be as indicated below. However the concentrations of additive used for cleaning/gauging might drastically be reduced according to the exposure time of pipe before dewatering.

Pre-Commissioning Operation name	Commercial name	Type	Volume to be treated	Concentration	Required volume
Controlled Flooding of Pipe	RX-5227	Combined Cocktail	1896m3	500 ppm	948 liters
Cleaning/Gauging	RX-5227	Combined Cocktail	1917.6m3	500 ppm	958.8 liters
	RX-9022	Dye		100 ppm	191.7 liters
Hydrotest	RX-5227	Combined Cocktail	12m3	500 ppm	6 liters
	RX-9022	Dye		100 ppm	1.2 liters
Pipeline Dewatering	MEG	MonoEthylene Glycol	9.51m3	100% (2 batches)	9.51m3
Riser Deployment	MEG	MonoEthylene Glycol	10m3	100% (1 batch)	10m3

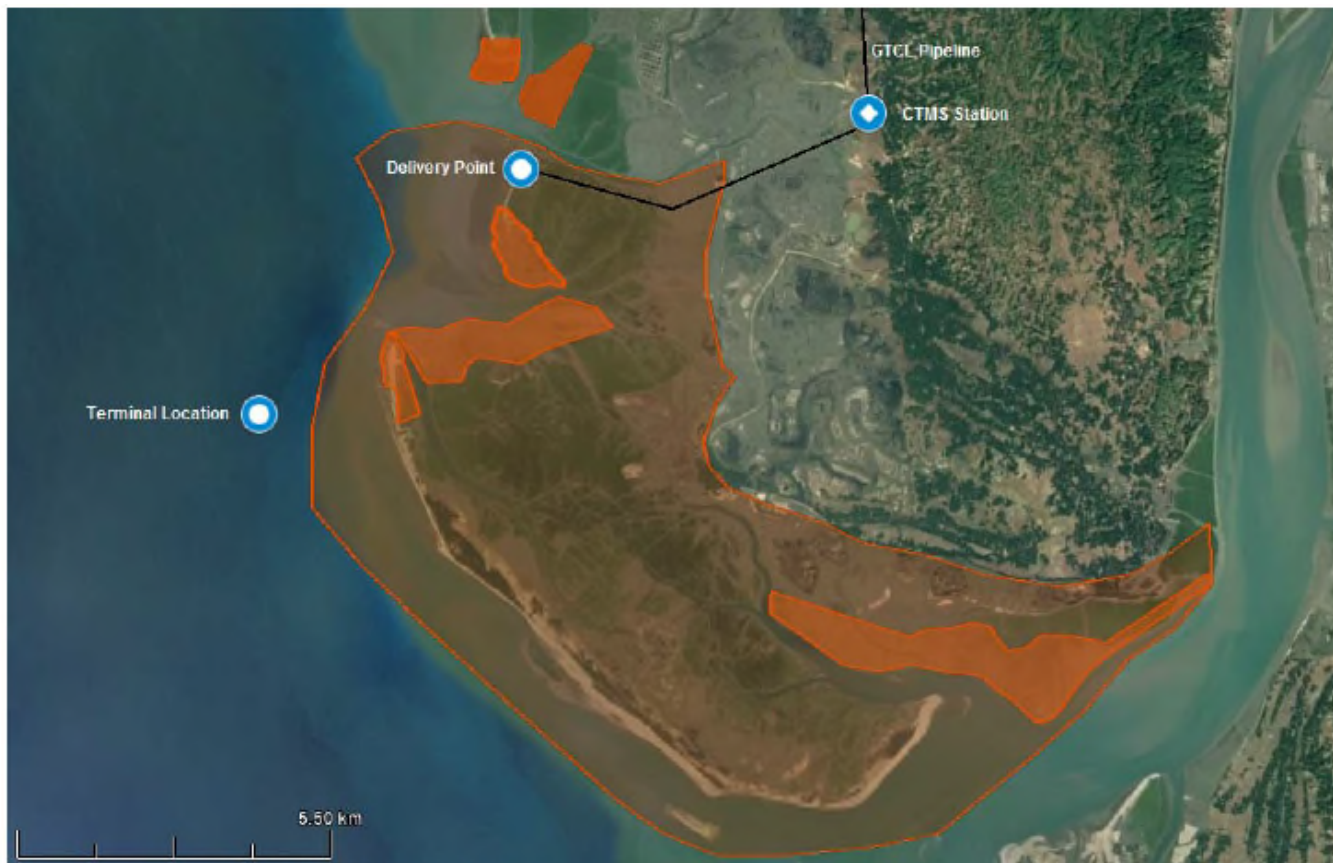
TABLE 1: PRE-COMMISSIONING VOLUME

6. ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Environmental and Social Impact Assessment by Acorn International

Acorn International did conduct an Environmental and Social Impact Assessment (ESIA). The ESIA defined the constraints and requirements to follow to minimize the footprint on the fauna and flora during the project.

An Ecologically Critical Area (ECA) has been defined.



Source: Acorn International, BSCP, Google Earth

FIGURE 2: ECOLOGICALLY CRITICAL AREA (ECA)

6.2 Requirement from ESIA for hydrotest water discharge

The EISA prohibits discharge of pipeline hydrotest waters in shorebird exclusion/buffer zones or sensitive ecosystems and requests to develop and implement a Hydrotest Water Disposal Plan that considers points of discharge, rate of discharge, chemical use and dispersion, environmental risk, and monitoring. Consequently, the pipeline hydrotest waters will be discharged to the ocean as specified in the ESIA. Depth of discharge is around 40 m (at PLEM location) which is the deepest and most remote location of the Project. This deep location will help dispersion of waters.

7. HYDROTEST WATER RELEASE

7.1 Location point

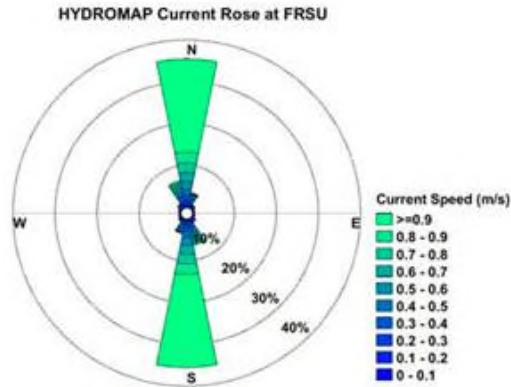
The point of discharge has been defined offshore and out of the ECA at the terminal location. The pipeline hydrotest and preservation water will be discharged at the offshore PLEM.

	COORDINATES	
Terminal location	91° 49' 07.00" E	21° 32' 04.00" N

TABLE 2: TERMINAL LOCATION COORDINATES

7.2 Monitoring

The pipeline hydrotest and preservation water discharge will be estimated in the pre-commissioning procedure through pig speed and known volume inside the pipe. The hydrotest water discharge rate is expected at 500 m³/hr. The discharge of the 2 000 m³ will take 4hrs.



The occurrence of current is mostly Northbound or Southbound (70%). The frequency of Current going to East is almost negligible. It ensures that the Discharge of Chemicals will never reach the Critical Area.

FIGURE 3: CURRENT ROSE AT TERMINAL LOCATION

7.3 Pre-commissioning Volume Discharge

Precom Operation	Volume of Water discharged	Point of Discharge	Volume of Inhibitors	Volume of Dye	Volume of MEG
Gross Dewatering before Cleaning/Gauging	2000m ³	Offshore PLEM location	0.95m ³	/	/
Gross Dewatering	2000m ³	Offshore PLEM location	0.95m ³	0.2m ³	/
Dewatering	15m ³	Offshore PLEM location	/	/	9.5m ³
Riser Dewatering	10m ³	Offshore PLUG location	/	/	10m ³

8. MEG RECOVERY

8.1 Location point

The Mono Ethylene Glycol (MEG) used during the pipeline dewatering will be recovered at the PLEM through a downline to surface and sent to shore for treatment and disposal.

The Mono Ethylene Glycol (MEG) used for the riser dewatering will be recovered at the Plug through a downline to surface and sent to shore for treatment and disposal.

PROJECT: SUMMIT FSRT

DOCUMENT: Treated water Disposal plan



Precom Operation	Point of Discharge	Volume of Inhibitors	Volume of Dye	Volume of MEG
Dewatering	Offshore PLEM location	/	/	9.5m3
Riser Dewatering	Offshore PLUG location	/	/	10m3

9. ANNEXES

Annex 1: MSDS Corrosion inhibitor/Biocide/Oxygen Scavenger, Dye, Mono Ethylene Glycol (MEG)

ROEMEX RX-5227
ROEMEX RX-9022
ROEMEX Ethylene Glycols

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: RX-5227

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

Use of substance / mixture: Corrosion Inhibitor/Oxygen Scavenger/Biocide PC8: Biocidal products (e.g. Disinfectants, pest control).

1.3. Details of the supplier of the safety data sheet

Company name: Roemex Limited
Badentoy Crescent
Badentoy Park
Portlethen
Aberdeen
AB12 4YD
United Kingdom

Tel: 01224 783444

Fax: 01224 783663

Email: msds@roemex.com

1.4. Emergency telephone number

Emergency tel: 01224 783444

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Acute Tox. 4: H302; Skin Corr. 1C: H314; -: EUH031

Most important adverse effects: Contact with acids liberates toxic gas. Harmful if swallowed. Causes severe skin burns and eye damage.

2.2. Label elements

Label elements:

Hazard statements: EUH031: Contact with acids liberates toxic gas.

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

Hazard pictograms: GHS05: Corrosion

GHS07: Exclamation mark



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Signal words: Danger

Precautionary statements: P260: Do not breathe dust/fumes/gas/mist/vapours/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301+312: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

P301+330+331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P303+361+353: IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Rinse skin with water/shower.

P304+340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

3,3-METHYLENEBIS(5-METHYLOXAZOLIDINE) - REACH registered number(s): PRE REGISTERED 2010.
EXPECTED REGISTRATION- 2018

EINECS	CAS	PBT / WEL	CLP Classification	Percent
266-235-8	66204-44-2	-	Acute Tox. 4: H302; Skin Corr. 1C: H314; Acute Tox. 4: H332	30-50%

AMMONIUM BISULPHITE - REACH registered number(s): 01-2119537321-49-0000

233-469-7	10192-30-0	-	Eye Irrit. 2: H319; STOT SE 3: H335; -: EUH031	1-10%
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SODIUM BISULPHITE - REACH registered number(s): 01-2119524563-42-0000

231-548-0	7631-90-5	-	Acute Tox. 4: H302; -: EUH031	1-10%
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Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Remove all contaminated clothes and footwear immediately unless stuck to skin.

Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Transfer to hospital if there are burns or symptoms of poisoning.

Eye contact: Bathe the eye with running water for 15 minutes. Transfer to hospital for specialist examination.

Ingestion: Wash out mouth with water. Do not induce vomiting. Give 1 cup of water to drink every 10 minutes. If unconscious, check for breathing and apply artificial respiration if necessary. If unconscious and breathing is OK, place in the recovery position. Transfer to hospital as soon as possible.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so. If unconscious and breathing is OK, place in the recovery position. If conscious, ensure the casualty sits or lies down. If breathing becomes bubbly, have the casualty sit and provide oxygen if available. Transfer to hospital as soon as possible.

[cont...]

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

Skin contact: Blistering may occur. Progressive ulceration will occur if treatment is not immediate.

Eye contact: Corneal burns may occur. May cause permanent damage.

Ingestion: Corrosive burns may appear around the lips. Blood may be vomited. There may be bleeding from the mouth or nose.

Inhalation: There may be shortness of breath with a burning sensation in the throat. Exposure may cause coughing or wheezing.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

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

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: Corrosive. In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: If outside keep bystanders upwind and away from danger point. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Do not attempt to take action without suitable protective clothing - see section 8 of SDS. Turn leaking containers leak-side up to prevent the escape of liquid. Refer to section 8 of SDS for personal protection details. If outside do not approach from downwind.

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Clean-up should be dealt with only by qualified personnel familiar with the specific substance. Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

[cont...]

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Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Avoid direct contact with the substance. Ensure there is sufficient ventilation of the area.
Do not handle in a confined space. Avoid the formation or spread of mists in the air.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed.

Suitable packaging: Must only be kept in original packaging.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Hazardous ingredients:

SODIUM BISULPHITE...100%

Workplace exposure limits:

Respirable dust

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	5 mg/m ³	-	-	-

DNEL/PNEC Values

DNEL / PNEC No data available.

8.2. Exposure controls

Engineering measures: Ensure there is sufficient ventilation of the area.

Respiratory protection: Self-contained breathing apparatus must be available in case of emergency.

Hand protection: Nitrile gloves. Minimum protection: EN420 standard- 0.26 mm

Eye protection: Tightly fitting safety goggles. Ensure eye bath is to hand.

Skin protection: Impermeable protective clothing.

Environmental: Prevent from entering in public sewers or the immediate environment.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid

Colour: Yellow-brown

Odour: Characteristic odour

Evaporation rate: Slow

Oxidising: Non-oxidising (by EC criteria)

Solubility in water: Soluble

Viscosity: Viscous

[cont...]

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Boiling point/range°C: 98	Melting point/range°C: -20
Flammability limits %: lower: Not applicable.	upper: Not applicable.
Flash point°C: 80	Part.coeff. n-octanol/water: <3
Autoflammability°C: Not applicable.	Vapour pressure: No data available.
Relative density: 1.14-1.18	pH: 8-10
VOC g/l: Not applicable.	

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.
Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

3,3-METHYLENEBIS(5-METHYLOXAZOLIDINE)

ORL	RAT	LD50	900	mg/kg
SKN	RAT	LD50	1207-1620	mg/kg

AMMONIUM BISULPHITE

ORAL	RAT	LD50	1540	mg/kg
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[cont...]

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SODIUM BISULPHITE...100%

IVN	RAT	LD50	115	mg/kg
ORL	RAT	LD50	2	gm/kg

Relevant hazards for product:

Hazard	Route	Basis
Acute toxicity (ac. tox. 4)	ING	Hazardous: calculated
Skin corrosion/irritation	DRM	Hazardous: calculated
Serious eye damage/irritation	OPT	Hazardous: calculated

Symptoms / routes of exposure

Skin contact: Blistering may occur. Progressive ulceration will occur if treatment is not immediate.

Eye contact: Corneal burns may occur. May cause permanent damage.

Ingestion: Corrosive burns may appear around the lips. Blood may be vomited. There may be bleeding from the mouth or nose.

Inhalation: There may be shortness of breath with a burning sensation in the throat. Exposure may cause coughing or wheezing.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

3,3-METHYLENEBIS(5-METHYLOXAZOLIDINE)

SCENEDESMUS SUBSPICATUS	48H EC50	5.7	mg/l
BACTERIA	48H EC50	44	mg/l
DAPHNIA MAGNA	48H EC50	37.9	mg/l
BRACHIDANIO RERIO	96H LC50	57.7	mg/l

AMMONIUM BISULPHITE

ALGAE	96H ErC50	43.9	mg/l
Daphnia magna	96H LC50	89	mg/l
FISH	96H LC50	316	mg/l

12.2. Persistence and degradability

Persistence and degradability: Biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: No bioaccumulation potential.

[cont...]

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12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Negligible ecotoxicity.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

Recovery operations: Not applicable.

Disposal of packaging: Arrange for collection by specialised disposal company.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

14.1. UN number

UN number: UN1760

14.2. UN proper shipping name

Shipping name: CORROSIVE LIQUID, N.O.S.
(3,3-METHYLENEBIS(5-METHYLOXAZOLIDINE))

14.3. Transport hazard class(es)

Transport class: 8

14.4. Packing group

Packing group: III

14.5. Environmental hazards

Environmentally hazardous: No

Marine pollutant: No

14.6. Special precautions for user

Special precautions: No special precautions.

Tunnel code: E

Transport category: 3

IMDG seg. group: 18. ALKALIS

Section 15: Regulatory information

[cont...]

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

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

* indicates text in the SDS which has changed since the last revision.

Emergency telephone number for Holland: NVIC (030-2748888). Only for the purpose of informing medical personnel in case of acute intoxications.

Phrases used in s.2 and s.3: EUH031: Contact with acids liberates toxic gas.

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H319: Causes serious eye irritation.

H332: Harmful if inhaled.

H335: May cause respiratory irritation.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: RX-9022

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

Use of substance / mixture: Leak Detection Dye PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents.

1.3. Details of the supplier of the safety data sheet

Company name: Roemex Limited
Badentoy Crescent
Badentoy Park
Portlethen
Aberdeen
AB12 4YD
United Kingdom

Tel: 01224 783444

Fax: 01224 783663

Email: msds@roemex.com

1.4. Emergency telephone number

Emergency tel: 01224 783444

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: This product has no classification under CLP.

2.2. Label elements

Label elements: This product has no label elements.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

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Hazardous ingredients:

ETHYLENE GLYCOL - REACH registered number(s): 01-2119456816-28-0000

EINECS	CAS	PBT / WEL	CLP Classification	Percent
203-473-3	107-21-1	-	Acute Tox. 4: H302	10-30%

ACETIC ACID - REACH registered number(s): 01-2119475328-30-0000

EINECS	CAS	PBT / WEL	CLP Classification	Percent
200-580-7	64-19-7	-	Flam. Liq. 3: H226; Skin Corr. 1A: H314	1-10%

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes.

Ingestion: Wash out mouth with water.

Inhalation: Consult a doctor.

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

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: No symptoms.

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

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Turn leaking containers leak-side up to prevent the escape of liquid.

[cont...]

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6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Ensure there is sufficient ventilation of the area.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed.

Suitable packaging: Must only be kept in original packaging.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Hazardous ingredients:

ETHYLENE GLYCOL

Workplace exposure limits:

Respirable dust

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	52 mg/m3 (vapour)	104 mg/m3 (vapour)	-	-

DNEL/PNEC Values

Hazardous ingredients:

ETHYLENE GLYCOL

Type	Exposure	Value	Population	Effect
DNEL	Inhalation	35 mg/m3	Workers	Systemic
DNEL	Dermal	106 mg/kg/day	Workers	Systemic
DNEL	Dermal	53 mg/kg/day	Consumers	Systemic
DNEL	Inhalation	7 mg/m3	Consumers	Systemic
PNEC	Fresh water	10 mg/l	-	-

[cont...]

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PNEC	Marine water	1 mg/l	-	-
PNEC	Soil (agricultural)	1.53 mg/l	-	-

8.2. Exposure controls

Engineering measures: Ensure all engineering measures mentioned in section 7 of SDS are in place.

Respiratory protection: Respiratory protection not required.

Hand protection: Nitrile gloves. Minimum protection: EN420 standard- 0.26 mm

Eye protection: Safety glasses. Ensure eye bath is to hand.

Skin protection: Protective clothing.

Environmental: An environmental assessment must be made to ensure compliance with local environmental legislation.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid

Colour: Dark purple

Odour: Pungent

Evaporation rate: Slow

Oxidising: Non-oxidising (by EC criteria)

Solubility in water: Soluble

Also soluble in: Mono Ethylene Glycol IsoPropanol

Viscosity: Non-viscous

Kinematic viscosity: <10 cP

Viscosity test method: Tested at 20 C- 100 rpm.

Boiling point/range°C: 103

Melting point/range°C: -25

Flammability limits %: lower: Not applicable.

upper: Not applicable.

Flash point°C: >110

Part.coeff. n-octanol/water: Mixture

Autoflammability°C: No data available.

Vapour pressure: No data available.

Relative density: 1.02-1.06

pH: 3-4

VOC g/l: No data available.

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

[cont...]

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10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.
Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

ETHYLENE GLYCOL

IVN	RAT	LD50	3260	mg/kg
ORL	MUS	LD50	5500	mg/kg
ORL	RAT	LD50	4700	mg/kg

ACETIC ACID...100%

IVN	MUS	LD50	525	mg/kg
ORL	RAT	LD50	3310	mg/kg

Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: No symptoms.

Section 12: Ecological information

12.1. Toxicity

Ecotoxicity values: No data available.

12.2. Persistence and degradability

Persistence and degradability: Biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: No bioaccumulation potential.

[cont...]

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12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Negligible ecotoxicity.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

Recovery operations: Not applicable.

Disposal of packaging: Arrange for collection by specialised disposal company.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

Transport class: This product does not require a classification for transport.

Section 15: Regulatory information

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

Specific regulations: All chemicals are registered by the Government of Canada and appear on the Domestic Substances List. All chemicals are registered by the Government of the United States of America and appear on the TSCA inventory.

15.2. Chemical Safety Assessment

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

* indicates text in the SDS which has changed since the last revision.

All components of this product are USA TSCA listed

RX-9022: Danish PR No-1951474

RX-9022: Norwegian PR No: 86285

Emergency telephone number for Holland: NVIC (030-2748888). Only for the purpose of informing medical personnel in case of acute intoxications.

Phrases used in s.2 and s.3: H226: Flammable liquid and vapour.

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

[cont...]

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Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: MEG

REACH registered number(s): 01-2119456816-28-0000

CAS number: 107-21-1

EINECS number: 203-473-3

Index number: 603-027-00-1

Synonyms: ETHANE-1,2-DIOL
1,2-DIHYDROXYETHANE
ETHANEDIOL

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

Use of substance / mixture: PC35: Washing and cleaning products (including solvent based products). Gas hydrate/hydrate inhibitor

1.3. Details of the supplier of the safety data sheet

Company name: Roemex Limited
Badentoy Crescent
Badentoy Park
Portlethen
Aberdeen
AB12 4YD
United Kingdom
Tel: 01224 783444
Fax: 01224 783663
Email: msds@roemex.com

1.4. Emergency telephone number

Emergency tel: +44(0)1224 783444 - 24 hour

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Acute Tox. 4: H302

Most important adverse effects: Harmful if swallowed.

2.2. Label elements

Label elements:

Hazard statements: H302: Harmful if swallowed.

Hazard pictograms: GHS07: Exclamation mark

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Signal words: Warning

Precautionary statements: P264: Wash exposed skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P301+312: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P330: Rinse mouth.
P501: Dispose of contents/container to in accordance with local regulations.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.1. Substances

Chemical identity: ETHYLENE GLYCOL

CAS number: 107-21-1

EINECS number: 203-473-3

REACH registered number(s): 01-2119456816-28-0000

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes.

Ingestion: Wash out mouth with water. Do not induce vomiting. If conscious, give half a litre of water to drink immediately. Transfer to hospital as soon as possible.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so. Consult a doctor.

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

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be soreness and redness of the mouth and throat. There may be difficulty swallowing. Nausea and stomach pain may occur. There may be vomiting.

Inhalation: Absorption through the lungs can occur causing symptoms similar to those of ingestion.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

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

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

[cont...]

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5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Turn leaking containers leak-side up to prevent the escape of liquid.

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Avoid the formation or spread of mists in the air. Avoid direct contact with the substance.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed.

Suitable packaging: Must only be kept in original packaging.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

[cont...]

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Hazardous ingredients:

ETHYLENE GLYCOL

Workplace exposure limits:

Respirable dust

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	52 mg/m3 (vapour)	104 mg/m3 (vapour)	-	-

DNEL/PNEC Values

Hazardous ingredients:

ETHYLENE GLYCOL

Type	Exposure	Value	Population	Effect
DNEL	Inhalation	35 mg/m3	Workers	Systemic
DNEL	Dermal	106 mg/kg/day	Workers	Systemic
DNEL	Dermal	53 mg/kg/day	Consumers	Systemic
DNEL	Inhalation	7 mg/m3	Consumers	Systemic
PNEC	Fresh water	10 mg/l	-	-
PNEC	Marine water	1 mg/l	-	-
PNEC	Soil (agricultural)	1.53 mg/l	-	-

8.2. Exposure controls

Engineering measures: Ensure all engineering measures mentioned in section 7 of SDS are in place.

Respiratory protection: Respiratory protection not required.

Hand protection: Nitrile gloves. Minimum protection: EN420 standard- 0.26 mm

Eye protection: Safety glasses. Ensure eye bath is to hand.

Skin protection: Protective clothing.

Environmental: An environmental assessment must be made to ensure compliance with local environmental legislation.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid

Colour: Colourless

Odour: Odourless

Evaporation rate: Slow

Oxidising: Non-oxidising (by EC criteria)

Solubility in water: Soluble

Viscosity: Non-viscous

Kinematic viscosity: ~21 mPa.s

Viscosity test method: tested at 20 C.

Boiling point/range°C: 198

Melting point/range°C: -13

Flammability limits %: lower: 3.5

[cont...]

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Flash point°C: 116
Autoflammability°C: 400
Relative density: ~1.113 @20C
VOC g/l: Not applicable.

upper: 28
Part.coeff. n-octanol/water: -1.36
Vapour pressure: 0.071
pH: 5.5-7.5

9.2. Other information

Other information: pH measured as 50% Aqueous solution

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.
Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

ETHYLENE GLYCOL

IVN	RAT	LD50	3260	mg/kg
ORL	MUS	LD50	5500	mg/kg
ORL	RAT	LD50	4700	mg/kg

Relevant hazards for product:

Hazard	Route	Basis
Acute toxicity (ac. tox. 4)	ING	Hazardous: calculated

[cont...]

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Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be soreness and redness of the mouth and throat. There may be difficulty swallowing. Nausea and stomach pain may occur. There may be vomiting.

Inhalation: Absorption through the lungs can occur causing symptoms similar to those of ingestion.

Delayed / immediate effects: Immediate effects can be expected after short-term exposure.

Section 12: Ecological information

12.1. Toxicity

Ecotoxicity values: No data available.

12.2. Persistence and degradability

Persistence and degradability: Biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: No bioaccumulation potential.

12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Negligible ecotoxicity.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

Recovery operations: Solvent reclamation/regeneration.

Disposal of packaging: Arrange for collection by specialised disposal company.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

Transport class: This product does not require a classification for transport.

Section 15: Regulatory information

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

Specific regulations: Not applicable.

[cont...]

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15.2. Chemical Safety Assessment

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

* indicates text in the SDS which has changed since the last revision.

MEG: Danish PR No-2172210

MEG: NEMS registration Number: 7332

Phrases used in s.2 and s.3: H302: Harmful if swallowed.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.