SapuraOMV (Western Australia) Pty Ltd

Bridging Document

Eagle-1 Drilling Environment Plan

May 2021

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DOCUMENT RECORD & MANAGEMENT

DOCUMENT INFORMATION

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CURRENT REVISION APPROVALS

Action	Name	Position	Initial	Date
Prepared by	SF	Senior Env Specialist		5 May 2021
Reviewed by	MC	Senior HSE Specialist		5 May 2021
Endorsed by	RB	Drilling Manager		5 May 2021
Approved by	ZZ	Country Manager		5 May 2021

REVISION / AMENDMENT RECORD

Rev	Date	Prepared By	Reviewed	Endorsed	Approved	Description
A	3 May 2021	SF	MC	-	-	Draft for internal review
B	5 May 2021	SF	MC	-	-	Revised draft for Internal review
0	5 May 2021	SF	MC	RB	ZZ	Submission to DMIRS

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Appendices

LIST OF ACRONYMS

Abbreviation	Description
ALARP	As low as reasonably practicable
bbls	Barrels
DMIRS	Department of Mines, Industry Regulation and Safety
DMP	Department of Mines and Petroleum
ENE	East-northeast
EP	Environment Plan
HSE	Health, Safety and Environment
LCM	Lost Circulation Material
LOWC	Loss of Well Control
m	Metre
m^3	Cubic metre
MODU	Mobile Offshore Drilling Unit
NE	Northeast
NEPC	National Environment Protection Council
NM	Nautical Mile
NNW	North-northwest
NWS	North West Shelf
OCNS	Offshore Chemical Notification Scheme
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
PHG	Pre-Hydrated Gel
PLONOR	Pose Little or No Risk to the Environment
PSLA	Petroleum (Submerged Lands) Act 1982
PSLA(E)R	Petroleum (Submerged Lands) (Environment) Regulations 2012
SDS	Safety Data Sheet
SW	Southwest
WA	Western Australia
WBM	Water-Based Mud
WNW	West-northwest
WSW	West-southwest

1. Executive Summary

SapuraOMV proposes a minor change to the chemical disclosure provided in the in-force Environment Plan (EP; AU-HS-EXT-003) for the Eagle-1 drilling campaign. The change involves storing and potentially using, during drilling, two additional drilling fluid additives that were not included in the chemical disclosure tables in the accepted EP.

The additives are the MI Swaco products SAPP (sodium acid pyrophosphate), a thinner that may be used as a contingency to address downhole issues during drilling, such as stuck pipe, and magnesium oxide which is used as a pH buffer. These products may be added to the KLA-Shield water-based drilling fluid system, each representing no more than 0.01% of that system and less than 0.003 % of the entire chemical disclosure inventory described in the accepted EP.

Ecotoxicity information in the Safety Data Sheets (SDS) for these products (Appendix B) indicates they are non-toxic to marine life. Both are listed 'E' category under the OCNS and also considered to be PLONOR (Pose Little Or No Risk to the environment) (OSPAR, 2013). The use of these products in the drilling fluid for Eagle-1 will not change the Activity description or risk profile in the EP, or require any additional or different management measures for the potential impacts/risk of drilling fluids to be managed to ALARP and acceptable levels. No changes to the in-force EP are required beyond amendment to the Chemical Disclosure Tables for the KLA-Shield drilling fluid system.

This Bridging Document (BD) describing the proposed change has been prepared in accordance with the *Chemical Disclosure Guidelines* (DMP, 2013), Section 2.3.1 of the *Guideline for the Development of Environment Plans In WA* (DMP, November 2016) and consistent with the commitment in Section 2.5.6 (Chemical and Other Substance Use) of the in-force EP. It includes an updated Chemical Disclosure Reporting Template for the KLA-Shield water-based drilling fluid system (Appendix A).

2. Introduction

2.1 Background

SapuraOMV is undertaking a single well exploration drilling campaign (Eagle-1 well) within exploration permit TP/25. The permit area is located in State waters in the Carnarvon Basin, Western Australia (WA). The objective of the exploration drilling activity at Eagle-1 is to explore for natural gas within the Triassic aged Mungaroo Formation sandstones.

The proposed Eagle-1 well is located approximately 30 km from the mainland coast and 55 km west-northwest (WNW) of Onslow. Drilling is expected to commence in Quarter 2 (Q2) 2021 and take approximately 45 days to complete. A pre-drilling seabed site survey (geophysical) was completed in January 2021.

Environmental aspects of the drilling campaign are being managed under an Environment Plan (EP) (AU-HS-EXT-003) submitted in accordance with the requirements of the Western Australian (WA) *Petroleum (Submerged Lands) Act 1982* (PSLA) and its associated WA Petroleum (Submerged Lands) (Environment) Regulations 2012 (PSL(E)R) and accepted by the Department of Mines, Industry Regulation and Safety (DMIRS) on 20 March 2020.

In accordance with the requirements of the PSLA(E)R) and the DMIRS' *Chemical Disclosure Guidelines* (DMP, 2013), the EP discloses all chemicals and other substances proposed to be used during the exploration drilling activity. The EP also assesses the potential impacts and risks associated with drilling discharges (EP Section 6.6) and with the accidental loss to sea of stored chemicals (EP Section 7.4).

The EP (Section 2.5.6) includes a commitment for SapuraOMV to notify DMIRS, update the Chemical Disclosure Reporting Template and resubmit amendments in a Bridging Document (BD) to the EP in the event of variations to products and chemicals being used down-hole that were not foreseen at the time of EP submission, in accordance with the *Chemical Disclosure Guidelines* (DMP, 2013). This document meets that commitment.

2.2 Overview of Change

Pre-drilling preparations for the Eagle-1 well have identified a requirement for the potential use of two drilling fluid additives that are not included in the in-force EP, namely:

- the MI Swaco product SAPP (sodium acid pyrophosphate), which is primarily used as a thinner in water-based fluids. This water-soluble product is considered non-toxic to marine life, is listed 'E' category under the OCNS and also considered to be PLONOR (Pose Little Or No Risk to the environment) (OSPAR, 2013). This chemical is required as a contingency additive to drilling fluids in the unlikely event of downhole (eg stuck pipe) issues during drilling.
- magnesium oxide, provided by MI Swaco, which is used as a pH buffer. This product is considered non-toxic to marine life, is listed 'E' category under the OCNS and also categorised as PLONOR (Pose Little Or No Risk to the environment) (OSPAR, 2013).

The proposed change does not involve any modifications to the Activity as detailed in the EP or any change to the risk profile of the Activity as described in the EP.

2.3 Purpose of this Bridging Document

The purpose of this BD is to bridge the use of these two products to the Activity described in the EP, including confirming that the potential environmental impacts and risks associated with their

use have been evaluated and will be managed to 'As Low as Reasonably Practicable' (ALARP) and acceptable levels.

This BD has been prepared in accordance with the DMIRS *Guideline for the Development of Environment Plans In WA* (DMP, November 2016), specifically Section 2.3.1 of the guidelines which require:

- Reference to all relevant documents being bridged to (e.g. EP and OSCP): **Section 2.4**
- Description of, and reasons for, modification to the activity: **Section 2.2**
- Location of the modified activity: **Section 3.1**
- Timing of the modified activity: **Section 3.2**
- Risk assessment of additional or increased environmental risks and impacts, including management measures and demonstration of ALARP and acceptability: **no additional risks or impacts, refer Section 4**
- A statement that all environmental risks or potential environmental impacts associated with the activity will be managed in accordance with the BD and the EP being bridged to: **Section 2.4, Section 5**
- Any other relevant details not included in the approved EP that is being bridged to: **updated Chemical Disclosure tables in Appendix A and SDS in Appendix B**.

2.4 Environmental Management Framework

The proposed use of SAPP and magnesium oxide covered in this BD will be conducted in accordance with the environmental management framework and relevant specific measures described in the in-force Eagle-1 Drilling Environment Plan (Reference: AU-HS-EXT-003) and this BD. Apart from an update to the chemical disclosure tables, no changes to the EP are required to cover use of the products.

3. Description of the Change

3.1 Location (no change)

The proposed use of the drilling additives described in this BD will be conducted entirely within the petroleum exploration permit area TP/25, located in the Carnarvon Basin, offshore WA and within the Operational Area defined in the in-force EP.

3.2 Activity Duration and Timing (no change)

The proposed use of the additional products will occur during drilling activities and therefore within the timeframe for the Eagle-1 drilling described in the in-force EP.

3.3 Activity Details

3.3.1 Chemical and Other Substance Use

As prescribed under the PSLA(E)R 2012 and DMIRS' *Chemical Disclosure Guidelines* (DMP, 2013), the Chemical Disclosure Reporting (CDR) Template in the in-force EP describes all chemicals and other substances that potentially may be used for the Eagle-1 exploration drilling campaign. The CDR Tables presented in Appendix E of the EP include description of the KLA-Shield WBM drilling fluid system for 12-1/4" and 8-1/2" hole sections. The same KLA-Shield WBM used for drilling will be left in the well between cement plugs to provide overbalance during cement transition.

The proposed change involves the potential use of two additional additives in the KLA-Shield WBM drilling fluid system:

- magnesium oxide, which will comprise approximately 0.01 % of the KLA-Shield water-based drilling fluid system, representing approximately 0.0025 % of the entire chemical disclosure inventory described in the EP
- SAPP (sodium acid pyrophosphate) is a potential contingency additive to the KLA-Shield WBM drilling fluid system. If required, it is expected to represent approximately 0.001 % of that system and approximately 0.0002 % of the entire chemical disclosure inventory described in the EP.

The use of these products remains consistent with the description of the Activity provided in Section 2.5 of the in-force EP, including the description of chemical and other substance use in Section 2.5.6 of the EP. An updated Chemical Disclosure Reporting Template for the KLA-Shield water-based drilling fluid system is provided in Appendix A and SDS for the two additional products are provided in Appendix B.

4. Environmental Impact and Risk Assessment

As described in Section 2.5.6 of the in-force EP, SapuraOMV's Chemical Risk Assessment Procedure (Doc No: AU-HS-PRO-010-1.0) is used to determine if chemicals associated with drilling operations are acceptable for discharge. SapuraOMV preferentially selects chemicals associated with drilling operations, including drilling fluids and cementing additives, that are CHARM rated Gold or Silver or OCNS ranked E or D with no substitution warnings.

The proposed drilling additives are OCNS ranked E with no substitution warnings, considered to be PLONOR and categorised as 'non toxic' to marine life (Appendix B).

Review of the use of these chemicals via the Chemical Risk Assessment Procedure has therefore concluded that they are acceptable for marine discharge.

In accordance with Section 8.10 of the EP, the assessment of potential impacts and risks associated with drilling fluid (either through discharge or accidental spills) in the in-force EP was also reviewed to determine if the additional drilling fluid chemicals would result in an increase in the impacts or risks described. Noting the environmentally benign nature of the products and the low proportion of drilling fluids that they would represent (if used), the potential use of these products as additional drilling fluid additives was determined to make no change to the risk assessment for Drilling Discharges (Section 6.6) or for Small Chemicals and Hydrocarbon Spills (Section 7.4) in the in-force EP, with the existing controls considered adequate to manage the impacts/risks to ALARP and acceptable levels.

Since the change will not introduce any additional or increased environmental risks and impacts from those described in the in-force EP, no further assessment of risk or demonstration of ALARP or acceptability is required in this BD.

5. Implementation Strategy

To ensure SapuraOMV's environmental performance requirements for the Activity are achieved, use of SAPP and magnesium oxide will be conducted within the framework of SapuraOMV's HSE Policy, HSEMS and the commitments made in the EP, as described in Section 8 of the in-force EP, and this BD.

6. References

Department of Mines and Petroleum (2013). Chemical Disclosure Guideline, version 2 August 2013. Department of Mines and Petroleum, Perth WA.

Department of Mines and Petroleum (2013). Guideline For The Development Of Petroleum And Geothermal Environment Plans In Western Australia, November 2016. Department of Mines and Petroleum, Perth WA

OSPAR (2013). OSPAR List of substances used and discharged offshore which are considered to pose little or no risk to the environment (PLONOR) – update 2018. OSPAR Agreement 2013-06 (replacing Agreement 2012-06). Available at: https://www.ospar.org/documents?d=32939.

Appendices

Appendix A – Chemical Disclosure Tables

A. SYSTEM DETAILS

OPERATOR	**SAPURAOMV UPSTREAM (WA) PTY LTD**
PROJECT/WELL	**EAGLE-1**
SYSTEM	**KLA SHEILD WBM**
TOTAL VOLUME OF SYSTEM	**556.46 m^3**

B. PRODUCT LIST

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
Water	MI Swaco	Base fluid	55.35%	None	No
Polypac UL	MI Swaco	Fluid loss control	0.47%	Acute Toxicity: Poly anionic Cellulose LD50 Oral (Rat): = 27000 mg/kg Ld50 Dermal (Rabbit): >2 g/kg LC50 Inhalation (Rat): > 5800 mg/m^3, (4h) Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards Ecotoxicity: Not considered toxic to algae, fish, or invertebrates. Biodegregation/Bioaccumulation: Product is biodegradable, does not bio accumulate.	Yes
M-I-X II*	MI Swaco	LCM	0.16% [max]	Acute Toxicity: No information available. Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards. Ecotoxicity: No information available. Biodegregation/Bioaccumulation: Not applicable; inorganic chemical.	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
Diaseal M*	MI Swaco	LCM	0.16% [max]	Acute Toxicity: No information available. Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards. Ecotoxicity: No information available. Biodegregation/Bioaccumulation: Not applicable; inorganic chemical.	Yes
Caustic Soda	MI Swaco	Alkalinity	0.02%	Acute Toxicity: Sodium Hydroxide Ld50 Dermal (Rabbit): 1350 mg/kg Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards Ecotoxicity: Not considered toxic to fish, algae, or invertebrates. Toxicity to fish LC60: 45.4 mg/L (96h) Biodegregation/Bioaccumulation: Not applicable; inorganic chemical	Yes
Potassium Chloride	MI Swaco	Weighting agent	4.75%	Acute Toxicity: None Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards Ecotoxicity: Not considered toxic to fish, algae, or invertebrates. Biodegregation/Bioaccumulation: Not applicable; inorganic chemical	Yes
Kla-Stop	MI Swaco	Inhibition	1.16%	Acute toxicity: Reaction products of Propane- 1,2-diol: LD50 oral (rat): 2885 mg/kg, LD50 Dermal (rabbit): 2979 mg/kg, 1ml/kg. LC50 inhalation (Rat 6h): 0.74 mg/L Chronic Toxicity: No known sensitizing, carcinogenic, reproductive, or mutagenic effects.	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
				Ecological Information: Toxicity to Fish (96h): >700 mg/L Toxicity to algae (72h): >700 mg/L Toxicity to Invertebrates (48h): >1001 mg/L Not biodegradable. Does not bioaccumulate	
G-Seal Plus*	MI Swaco	LCM	0.16% [max]	Acute Toxicity: Crystalline Silica LD50 Oral (Rat): 500 mg/Kg Chronic Toxicity: Not known to be mutagenic, or sensitizing. No known reproductive or developmental hazards, Containts a known or suspected carcinogen Ecotoxicity: Not considered toxic to fish, algae, or invertebrates. Toxicity to fish LC50: 10000mg/L (96h), Toxicity to Algae (72h): >1000 mg/L, Toxicity to Invertebrates (24h); >10000 mg/L Biodegregation/Bioaccumulation: Not applicable; inorganic chemical	Yes
Safe-Carb (all grades)*	MI Swaco	LCM	0.16% [max]	Acute Toxicity: Calcium Carbonate: LD50 Oral (Rat): 6450 mg/kg Crystalline Silica: LD50 Oral (Rat): = 500 mg/kg. Chronic toxicity: Product contains no components known to be sensitizing or mutagens. Crystalline silica dust is listed by IARC as Group 1 carcinogen. or developmental Chronic Toxicity: Not known to be mutagenic or sensitizing. Crystalline silica dust is listed by IARC as Group 1 carcinogen. No known reproductive or developmental hazards. Ecotoxicity: Crystalline Silica: Toxicity to Fish: LC50(Danio Rerio): = 10000 mg/L (96 h) Toxicity to Algae: EC50: >1000 mg/L (120 h) Toxicity to Invertebrates: EC50 (Daphnia magna) >10000 mg/L (48 h) Biodegregation/Bioaccumulation: Not applicable- Inorganic chemical.	Yes
Save-Scav NA*	MI Swaco	Oxygen scavenger	0.16% [max]	Acute Toxicity: Ammonium Hydrogensulfite	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
				LD50 Oral (Rat): = 2746 mg/kg, > 2150 mg/kg LD50 Dermal: >2000 mg/kg (24 h) LC50 Inhalation: 5.5 mg/L (4 h) Sulphur dioxide LC50 Inhalation (Rat): 2500 ppm (1 h) Chronic Toxicity: No known carcinogenic, reproductive, or mutagenic effects. Repeated or prolonged contact may cause allergic reactions in very susceptible persons. Ecotoxicity: This product is not considered toxic to algae, fish, daphnia, or invertebrates. Ammonium Hydrogensulfite EC50 (Algae): = 43.8 mg/L (72 h) LC50(Fish): > 464 mg/L (96 h) EC50 (daphnia and invertebrates) =89 mg/L (48 h) Biodegregation/Bioaccumulation: Not applicable- Inorganic chemical.	
Soda Ash*	MI Swaco	Alkalinity	0.03%	Acute Toxicity: Sodium carbonate LD50 Oral (Rat): > 4090 mg/kg LC50 Inhalation (Rat): >2300 mg/m^3 (1 h) Chronic Toxicity: No known sensitizing, carcinogenic, reproductive, or mutagenic effects. Ecotoxicity: This product is not considered toxic to algae, fish, daphnia, or invertebrates. LC50(Lepomis macrochirus): = 300 mg/L (96 h) LC50(Pimephales promelas): 310-1220 mg/L (96 h) EC50(Nitzchia): = 242mg/L (120 h) EC50 (Daphnia magna) = 265 mg/L (48 h) Biodegregation/Bioaccumulation: Not applicable- Inorganic chemical.	Yes
Circal (all)*	MI Swaco	LCM	0.16% [max]	Acute Toxicity: No information available.	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
				Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards. Ecotoxicity: No information available. Biodegregation/Bioaccumulation: Not applicable; inorganic chemical.	
Calcium Chloride	MI Swaco	LCM	0.16%	Acute Toxicity: Calcium Chloride: LD50 Oral (Rat): 1000 mg/Kg, LD50 Dermal (Rabbit): >5000 mg/Kg Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards. Ecotoxicity: Calcium Chloride: Toxicity to Fish LC50: 10650 mg/L, Toxicity to Invertebrates LD50: 2400mg/L Biodegregation/Bioaccumulation: Not applicable; inorganic chemical	Yes
IDCAP D	MI Swaco	Encapsulator	0.16%	Acute toxicity: None known Chronic Toxicity: No known sensitizing, carcinogenic, reproductive, or mutagenic effects. Ecological: Product is not considered toxic to fish, algae, or invertebrates. Product is not biodegradable, does not bioaccumulate.	Yes
Walnut Nutplug*	MI Swaco	Fluid loss control	0.16% [max]	Acute Toxicity: Crystalline Silica LD50 Oral (Rat): = 500 mg/kg. Chronic Toxicity: Product contains no components known to be sensitizing or mutagens. Crystalline silica dust is listed by IARC as Group 1 carcinogen. No known reproductive hazards.	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
				Ecotoxicity: Not considered toxic to algae, fish, or invertebrates. Biodegregation/Bioaccumulation: Not applicable: Inorganic chemical.	
KWIK-SEAL (all grades)*	MI Swaco	Fluid loss control	0.16% [max]	Acute Toxicity: Antimony trioxide LD50 Oral (Rat): = 34600 mg/kg LD50 Dermal (Rabbit): >2000 mg/kg Chronic Toxicity: Not known to be carcinogenic, mutagenic, or sensitizing. No known reproductive or developmental hazards No known sensitizing, carcinogenic, reproductive, sensitizing, or mutagenic effects. Ecotoxicity: Antimony trioxide: Toxicity to Fish LC50(96h): > 80 mg/L, Toxicity to algae EC50(96h): 0.65-0.81 mg/L, Toxicity to invertebrates EC50 (48h): 361.5-496 mg/L Biodegregation/Bioaccumulation: Product is biodegradable, does not bio accumulate.	Yes
Duo-Vis	MI Swaco	Viscosifier	0.24%	Acute Toxicity: None known Chronic Toxicity: No known sensitizing, reproductive, or mutagenic effects. Ecotoxicity: This product is not considered toxic to algae, fish, or invertebrates Biodegregation/Bioaccumulation: Product is biodegradable, doe not bioaccumulate	Yes
M-I Bar	MI Swaco	Weighting agent	33.71%	Acute Toxicity: Crystalline Silica LD50 Oral (Rat): = 500 mg/kg. Chronic toxicity:	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
				Product contains no components known to be sensitizing or mutagens. Crystalline silica dust is listed by IARC as Group 1 carcinogen. Product does not contain any known or suspected reproductive or developmental hazards. Ecotoxicity: Toxicity to Fish: LC50(Danio Rerio): = 10000 mg/L (96 h) Toxicity to Algae: EC50: >1000 mg/L (120 h) Toxicity to Invertebrates: EC50 (Daphnia magna) >10000 mg/L (48 h) Biodegregation/Bioaccumulation: Not applicable- Inorganic chemical.	
M-I Gel	MI Swaco	Viscosifier	3.96%	Acute Toxicity: Crystalline Silica LD50 Oral (Rat): = 500 mg/kg. Chronic toxicity: Product contains no components known to be sensitizing or mutagens. Crystalline silica dust is listed by IARC as Group 1 carcinogen. Product does not contain any known or suspected reproductive or developmental hazards. Ecotoxicity: Toxicity to Fish: LC50(Danio Rerio): = 10000 mg/L (96 h) Toxicity to Algae: EC50: >1000 mg/L (120 h) Toxicity to Invertebrates: EC50 (Daphnia magna) >10000 mg/L (48 h) Biodegregation/Bioaccumulation: Not applicable- Inorganic chemical.	Yes
SAPP*	MI Swaco	Thinner	~0.001%	Acute Toxicity: Disodium dihydrogen diphosphate LD50 Oral (Rat): = 1800 mg/Kg. LC50 Inhalation (Rat): >0.58 mg/L, (4h) Chronic toxicity: This product does not contain any components suspected to be sensitizing or mutagen. This product does not contain any known or suspected carcinogens. This product does not contain any known or suspected reproductive hazards. Ecotoxicity: Toxicity to fish: This product is not considered toxic to fish. Toxicity to algae: This product is not considered toxic to algae.	Yes

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity info	SDS attached
				Toxicity to daphnia and aquatic invertebrates: This product is not considered toxic to invertebrates. Biodegradation/Bioaccumulation: Not applicable-Inorganic chemical	
Magnesium Oxide	MI Swaco	pH buffer	~0.01%	Acute Toxicity: None known Chronic toxicity: No known sensitizing, carcinogenic, reproductive, or mutagenic effects. Ecotoxicity: Product is not considered toxic to fish, algae, or invertebrates. Product contains no substance considered to be persistent, bioaccumulating, or toxic	Yes
Total			**~101.28%***		

C. CHEMICAL LIST

Chemicals within products in Part B	CAS number	Mass fraction (%)
Water (including mix water supplied by client)	7732-18-5	~ 56
Barite ($Ba(SO_4)$)	13462-86-7	~ 36
Bentonite	1302-78-9	~ 7
Potassium Chloride	7447-40-7	~ 6
Silica, crystalline, quartz	14808-60-7	~ 3
Reaction products of propane-1,2-diol, propoxylated by amination of the terminal hydroxyl groups	9046-10-0	~ 1
Ammonium hydrogensulfite	10192-30-0	~ 1
Sodium carboxymethylcellulose	9004-32-4	< 1
Cellulose	9004-34-6	< 1
Xanthan gum	11138-66-2	< 1
Calcium chloride	10043-52-4	< 1
Calcium carbonate	471-34-1	< 1
Limestone	1317-65-3	< 1
Hydroxypropyl acetate, sodium acrylate, acrylic acid terpolymer	86864-96-2	< 1

Chemicals within products in Part B	CAS number	Mass fraction (%)
Coke, petroleum, calcined	64743-05-1	< 1
Diatomaceous earth	61790-53-2	< 1
Sodium carbonate	497-19-8	< 0.1
Graphite	7782-42-5	< 0.1
Sodium hydroxide	1310-73-2	< 0.1
Calcium hydroxide	1305-62-0	< 0.1
Antimony trioxide	1309-64-4	< 0.1
Polypropylene	9003-07-0	< 0.1
Cellophane	9005-81-6	< 0.01
Glyoxal	107-22-2	< 0.01
Sulfur dioxide	7446-09-5	< 0.01
Sorbic acid, potassium salt	590-00-1	< 0.01
Magnesium Oxide	1309-48-4	< 0.01*
Disodium dihydrogen diphosphate*	7758-16-9	< 0.01*
2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate, octadecyl 2-methyl-2-propenoate and 2-propenoic acid (Impurity)	145417-45-4	< 0.001
Acrylic Acid (Impurity)	79-10-7	< 0.001
Glycine, N,N-bis[2-[bis(carboxymethyl)amino]ethyl]-, pentasodium salt (Impurity)	140-01-2	< 0.001
Total		**~101.28%***

*denotes contingency chemical, or figure affected by contingency chemicals

Appendix B–Safety Data Sheets (SDS)

SDS no. PID1436
Version 2
Revision date 06-Jul-2017
Supersedes Date: 11-Jun-2014

Safety Data Sheet
SAPP

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name SAPP
Product code PID1436

Molecular weight 222.15

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

Recommended Use SAPP dispersant. Thinner.

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
ABN: 67 009 214 162
Level 5
256 St. George Tce
Perth
WA 6000
T = +61 08 9440 2900
F = +61 08 9322 3080
+47 51577424

SDS@slb.com

1.4 Emergency Telephone Number

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

2. Hazards Identification

2.1 Classification of the substance or mixture

GHS Classification

Health hazards

Serious eye damage/eye irritation	Category 2

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements

Signal word
WARNING

Hazard Statements
H319 - Causes serious eye irritation

Precautionary statements
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

-

Contains
Disodium dihydrogen diphosphate

2.3 Other hazards

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature

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

3. Composition/information on Ingredients

3.1 Substances

Chemical Name	EC No	CAS No	Weight-%
Disodium dihydrogen diphosphate	231-835-0	7758-16-9	60-100

3.2 Mixtures

Not applicable

4. First Aid Measures

4.1 First aid measures

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

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

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

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

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

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

Symptoms

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

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

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

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

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing media appropriate for surrounding material.

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

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
None known.

Hazardous combustion products
Fire or high temperatures create: Oxides of phosphorus.

5.3 Advice for firefighters

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

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

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2 Environmental precautions

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

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

6.3 Methods and material for containment and cleaning up

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

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

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

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

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

7.2 Conditions for safe storage, including any incompatibilities

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

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place Avoid excessive heat for prolonged periods of time. Protect from moisture Avoid contact with: Strong alkalies.

Storage class Chemical storage.

Packaging materials Use specially constructed containers only.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Exposure limits NUI = Nuisance dust, TWA 4mg/m^3 Respirable Dust, 10mg/m^3 Total Dust.
No biological limit allocated

Component Information

Chemical Name	Arabic	Australia	Egypt
Disodium dihydrogen diphosphate	Not determined	Not determined	Not determined
Chemical Name	**India**	**Indonesian**	**Japan**
Disodium dihydrogen diphosphate	Not determined	Not determined	Not determined
Chemical Name	**Kazakhstan**	**Kuwait**	**New Zealand**
Disodium dihydrogen diphosphate	Not determined	Not determined	Not determined

Chemical Name	Malaysia	Philippines	Russia
Disodium dihydrogen diphosphate	Not determined	Not determined	Not determined
Chemical Name	**Thailand**	**Vietnam**	**Turkey**
Disodium dihydrogen diphosphate	Not determined	Not determined	Not determined

8.2 Exposure controls

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

Engineering Controls
Ensure adequate ventilation

Personal protective equipment

Eye protection	Use eye protection according to EN 166, designed to protect against powders and dusts Tightly fitting safety goggles Safety glasses with side-shields
Hand protection	Wear gloves according to EN 374 to protect against skin effects from powders Repeated or prolonged contact Use protective gloves made of: Nitrile Neoprene PVC Frequent change is advisable
Respiratory protection	No personal respiratory protective equipment normally required In case of insufficient ventilation wear suitable respiratory equipment Half mask with a particle filter P2 (European Norm EN 143 = former DIN 3181) At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.
Skin and body protection	Wear suitable protective clothing Eye wash and emergency shower must be available at the work place.
Hygiene Measures	Wash hands before eating, drinking or smoking Remove and wash contaminated clothing before re-use

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	Solid
Appearance	Crystalline Powder
Odor	Odorless
Color	White
Odor threshold	Not applicable

Property	Values	Remarks
pH	No information available	
pH @ dilution	4.0 - 5.0	@ 10 g/l
Melting / freezing point	No information available	
Boiling point/range	No information available	
Flash point	No information available	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not applicable	

Flammability Limit in Air		
Upper flammability limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	1.8 - 1.9 sg	20 °C
Bulk density	1000-1200 kg/m³	
Relative density	No information available	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
log Pow	No information available	

Explosive properties	Not applicable
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	222.15
VOC content(%)	None
Density	No information available

Comments
The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid

Protect from moisture. Avoid excessive heat for prolonged periods of time.

10.5 Incompatible materials

Strong alkalies.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Inhalation Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye contact Causes serious eye irritation.

Skin contact Prolonged skin contact may cause skin irritation.

Ingestion Ingestion may cause stomach discomfort.

Unknown acute toxicity Not applicable.

Toxicology data for the components

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Disodium dihydrogen diphosphate	= 1800 mg/kg (Rat)	No data available	> 0.58 mg/L (Rat) 4 h

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

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

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

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

Routes of Exposure Eye contact.

Routes of entry No route of entry noted.

Specific target organ toxicity - Single exposure Not classified

Specific target organ toxicity - Repeated exposure Not classified.

Aspiration hazard Not applicable.

Other information Key literature references and sources for data. See Section 16 for more information.

12. Ecological Information

12.1 Toxicity

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

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

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

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

Toxicology data for the components

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Disodium dihydrogen diphosphate	No information available	No information available	No information available

12.2 Persistence and degradability

Not Applicable - Inorganic chemical.

12.3 Bioaccumulative potential

Not Applicable - Inorganic chemical.

12.4 Mobility

Mobility
Soluble in water.

Mobility in soil
No information available.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects.

None known.

12.7 Other information

Key literature references and sources for data. See Section 16 for more information.

13. Disposal considerations

13.1 Waste treatment methods

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

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

14. Transport information

14.1. UN number

Not regulated

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

14.3 Hazard class(es)

ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG/ANTAQ Hazard class	Not regulated
ICAO/ANAC Hazard class/division	Not regulated

14.4 Packing group

ADR/RID/ADN/ADG Packing group	Not regulated
IMDG/ANTAQ Packing group	Not regulated
ICAO/ANAC Packing group	Not regulated

14.5 Environmental hazard
No

14.6 Special precautions
Not applicable

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

15. Regulatory Information

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

This safety data sheet complies with the requirements of:
The Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

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

New Zealand Hazard Classification	Classified
HSNO approval no.	HSR002503
Group number	6.4A

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

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

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

Safe Work Australia.

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

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

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 [P.U.(A) 310/2013] (CLASS Regulations)
The Industry Code of Practice on Chemical Classification and Hazard Communication 2014 [P.U. (B) 128/2014] (ICOP)

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

16. Other Information

Prepared by	Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Anne Karin (Anka) Fosse
Supersedes Date:	11-Jun-2014
Revision date	06-Jul-2017
Version	2
This SDS has been revised in the following section(s)	All sections Product Code change No changes with regard to classification have been made.

Key literature references and sources for data
www.ChemADVISOR.com
Supplier
National Chemical Inventories
National regulatory information
National occupational exposure limits

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1. IDENTIFICATION

Product Name	**Magnesium oxide, >=85%**
Other Names	No Data Available
Uses	Agricultural, chemical and pharmaceutical chemical.
Chemical Family	No Data Available
Chemical Formula	MgO
Chemical Name	Magnesium oxide
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Not Scheduled

Globally Harmonised System

Hazard Classification NOT hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Signal Word None

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Magnesium oxide	MgO	1309-48-4	>=85 %
Ingredients determined not to be hazardous	Unspecified	Unspecified	Balance %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth, then drink plenty of water. Do not induce vomiting. Get medical advice/attention if you feel unwell.
Eye	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. If eye irritation persists, get medical advice/attention.
Skin	IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention.
Advice to Doctor	Treat symptomatically.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
Flammability Conditions	Non-combustible; Material itself does not burn.
Extinguishing Media	If material is involved in a fire, use extinguishing media appropriate to surrounding fire conditions.
Fire and Explosion Hazard	Magnesium oxide may ignite and explode when heated with sublimed Sulfur, Magnesium powder or Aluminium powder. It reacts violently with interhalogens (e.g. Chlorine trifluoride) and produces flame; It incandesces when combined with Phosphorus pentachloride.
Hazardous Products of Combustion	Fire or heat may produce irritating, toxic and/or corrosive fumes.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways.
Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. SCBA and structural firefighter's uniform may provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. Do not touch or walk through spilled material. Avoid generating dust. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Collect material (wet sweep or vacuum up) and place into suitable containers for disposal (see SECTION 13).
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud.
Decontamination	Wash area down with excess water.
Environmental Precautionary Measures	Prevent entry into drains and waterways.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Minimise dust generation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Product can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Do not use compressed air to transfer, discharge or transport the product.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Avoid exposure to air and moisture. Keep away from heat and sources of ignition - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10).
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For Magnesium oxide (fume): - Safe Work Australia Exposure Standard: TWA = 10 mg/m3. - New Zealand Workplace Exposure Standard: TWA = 10 mg/m3.
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Use explosion-proof electrical/ventilating/lighting equipment.
Personal Protection Equipment	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: Dust mask/particulate filter respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Chemical goggles. - Hand protection: Handle with gloves. Recommended: Impervious gloves. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Overalls, safety shoes.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Take off contaminated clothing and wash before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder or granules
Odour	Odourless
Colour	White or beige/brown

pH	10.0 - 11.8 (1% aqueous soln.)
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	3,600 °C
Melting Point	2,800 °C
Freezing Point	No Data Available
Solubility	Insoluble in water
Specific Gravity	1.4 - 1.5
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	No information available.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	Magnesium oxide may ignite and explode when heated with sublimed Sulfur, Magnesium powder or Aluminium powder. It reacts violently with interhalogens (e.g. Chlorine trifluoride) and produces flame; It incandesces when combined with Phosphorus pentachloride.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material itself does not burn.
Reactions That Release Gases or Vapours	Fire/decomposition may produce irritating, toxic and/or corrosive fumes.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

General Information	Magnesium oxide may ignite and explode when heated with sublimed Sulfur, Magnesium powder or Aluminium powder. It reacts violently with interhalogens (e.g. Chlorine trifluoride) and produces flame; It incandesces when combined with Phosphorus pentachloride.
Chemical Stability	Stable under normal conditions.
Conditions to Avoid	Avoid generating dust.
Materials to Avoid	Incompatible/reactive with strong acids, strong oxidising agents, Chlorine trifluoride, Phosphorus pentachloride.
Hazardous Decomposition Products	Fire/decomposition may produce irritating, toxic and/or corrosive fumes.

Hazardous Polymerisation	Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: No adverse effects expected; Large amounts may cause nausea and vomiting. - Skin corrosion/irritation: May cause (mechanical) skin irritation. - Eye damage/irritation: May cause eye irritation. - Respiratory/skin sensitisation: No information available. - Germ cell mutagenicity: No information available. - Carcinogenicity: No information available. - Reproductive toxicity: No information available. - STOT (single exposure): Inhalation of Magnesium oxide (fume) can cause metal fume fever: cough, chest pain, flu-like fever. Inhalation of dust may result in respiratory tract irritation. - STOT (repeated exposure): No information available. - Aspiration toxicity: No information available.
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	No information available.
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	Prevent entry into drains and waterways.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	No information available.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	Magnesium oxide
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport
IMDG Code

Proper Shipping Name	Magnesium oxide
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport
IATA DGR

Proper Shipping Name	MAGNESIUM OXIDE
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Not Scheduled

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined

Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes

MAGOXB1000, MAGOXB6000, MAGOXB6100, MAGOXB6200, MAGOXI0002, MAGOXI0003, MAGOXI0004, MAGOXI0005, MAGOXI0085, MAGOXI0086, MAGOXI0097, MAGOXI0100, MAGOXI0101, MAGOXI0102, MAGOXI0106, MAGOXI0150, MAGOXI0200, MAGOXI0201, MAGOXI0202, MAGOXI0300, MAGOXI0301, MAGOXI0302, MAGOXI0303, MAGOXI0304, MAGOXI0400, MAGOXI0499, MAGOXI0500, MAGOXI0501, MAGOXI0502, MAGOXI0503, MAGOXI0600, MAGOXI0601, MAGOXI0700, MAGOXI0701, MAGOXI0702, MAGOXI0800, MAGOXI0900, MAGOXI0901, MAGOXI1000, MAGOXI1001, MAGOXI1002, MAGOXI1003, MAGOXI1004, MAGOXI1005, MAGOXI1006, MAGOXI1007, MAGOXI1008, MAGOXI1009, MAGOXI1010, MAGOXI1011, MAGOXI1012, MAGOXI1013, MAGOXI1014, MAGOXI1015, MAGOXI1016, MAGOXI1017, MAGOXI1018, MAGOXI1019, MAGOXI1020, MAGOXI1021, MAGOXI1022, MAGOXI1023, MAGOXI1024, MAGOXI1025, MAGOXI1026, MAGOXI1027, MAGOXI1028, MAGOXI1029, MAGOXI1030, MAGOXI1031, MAGOXI1032, MAGOXI1033, MAGOXI1034, MAGOXI1035, MAGOXI1050, MAGOXI1051, MAGOXI1100, MAGOXI1101, MAGOXI1133, MAGOXI1180, MAGOXI1199, MAGOXI1200, MAGOXI1201, MAGOXI1215, MAGOXI1300, MAGOXI1301, MAGOXI1302, MAGOXI1310, MAGOXI1311, MAGOXI1315, MAGOXI1316, MAGOXI1317, MAGOXI1318, MAGOXI1319, MAGOXI1320, MAGOXI1350, MAGOXI1353, MAGOXI1360, MAGOXI1391, MAGOXI1392, MAGOXI1400, MAGOXI1401, MAGOXI1402, MAGOXI1500, MAGOXI1501, MAGOXI1600, MAGOXI1601, MAGOXI1602, MAGOXI1603, MAGOXI1604, MAGOXI1700, MAGOXI1701, MAGOXI1702, MAGOXI1703, MAGOXI1800, MAGOXI1801, MAGOXI1802, MAGOXI1803, MAGOXI1804, MAGOXI1805, MAGOXI1806, MAGOXI1807, MAGOXI1808, MAGOXI1809, MAGOXI1810, MAGOXI1900, MAGOXI1901, MAGOXI2000, MAGOXI2100, MAGOXI2200, MAGOXI2300, MAGOXI2400, MAGOXI2500, MAGOXI2700, MAGOXI2701, MAGOXI2800, MAGOXI2801, MAGOXI2805, MAGOXI2808, MAGOXI2900, MAGOXI2901, MAGOXI2902, MAGOXI3000, MAGOXI3001, MAGOXI3002, MAGOXI3003, MAGOXI3010, MAGOXI3020, MAGOXI3100, MAGOXI3110, MAGOXI3200, MAGOXI3300, MAGOXI3301, MAGOXI3302, MAGOXI3400, MAGOXI3401, MAGOXI3402, MAGOXI3500, MAGOXI3501, MAGOXI3502, MAGOXI3600, MAGOXI3700, MAGOXI3701, MAGOXI3800, MAGOXI3801, MAGOXI3900, MAGOXI3901, MAGOXI4000, MAGOXI4001, MAGOXI4002, MAGOXI4100, MAGOXI4101, MAGOXI4200, MAGOXI4500, MAGOXI4501, MAGOXI4600, MAGOXI4601, MAGOXI4700, MAGOXI4701, MAGOXI4702, MAGOXI4703, MAGOXI4708, MAGOXI4709, MAGOXI4800, MAGOXI4801, MAGOXI4900, MAGOXI4901, MAGOXI5000, MAGOXI5001, MAGOXI5002, MAGOXI5100, MAGOXI5101, MAGOXI5200, MAGOXI5201, MAGOXI5300, MAGOXI5301, MAGOXI5510, MAGOXI5511, MAGOXI5512, MAGOXI5513, MAGOXI5515, MAGOXI5520, MAGOXI5521, MAGOXI5522, MAGOXI5523, MAGOXI5525, MAGOXI5526, MAGOXI5527, MAGOXI5528, MAGOXI5529, MAGOXI5530, MAGOXI5700, MAGOXI5750, MAGOXI5800, MAGOXI5801, MAGOXI5802, MAGOXI5900, MAGOXI5901, MAGOXI6000, MAGOXI6001, MAGOXI6002, MAGOXI6003, MAGOXI6004, MAGOXI6005, MAGOXI6006, MAGOXI6100, MAGOXI6101, MAGOXI6102, MAGOXI6103, MAGOXI6105, MAGOXI6200, MAGOXI6201, MAGOXI6202, MAGOXI6203, MAGOXI6262, MAGOXI6300, MAGOXI6301, MAGOXI6303, MAGOXI6400, MAGOXI6401, MAGOXI6402, MAGOXI6403, MAGOXI6404, MAGOXI6405, MAGOXI6406, MAGOXI6408, MAGOXI6409, MAGOXI6410, MAGOXI6500, MAGOXI6501, MAGOXI6502, MAGOXI6503, MAGOXI6504, MAGOXI6505, MAGOXI6506, MAGOXI6508, MAGOXI6510, MAGOXI6520, MAGOXI6600, MAGOXI6601, MAGOXI6602, MAGOXI6603, MAGOXI6700, MAGOXI6701, MAGOXI6800, MAGOXI6801, MAGOXI6802, MAGOXI6900, MAGOXI7000, MAGOXI7001, MAGOXI7002, MAGOXI7003, MAGOXI7004, MAGOXI7100, MAGOXI7101, MAGOXI7200, MAGOXI7300, MAGOXI7400, MAGOXI7500, MAGOXI7600, MAGOXI7601, MAGOXI7700, MAGOXI7701, MAGOXI7800, MAGOXI7801, MAGOXI7900, MAGOXI7901, MAGOXI8000, MAGOXI8001, MAGOXI8002, MAGOXI8003, MAGOXI8004, MAGOXI8100, MAGOXI8200, MAGOXI8300, MAGOXI8400, MAGOXI8401, MAGOXI8500, MAGOXI8600, MAGOXI8700, MAGOXI8701, MAGOXI8800, MAGOXI8900, MAGOXI9000, MAGOXI9001, MAGOXI9002, MAGOXI9003, MAGOXI9100, MAGOXI9200, MAGOXI9201, MAGOXI9202, MAGOXI9300, MAGOXI9310, MAGOXI9400, MAGOXI9401, MAGOXI9500, MAGOXI9501, MAGOXI9600, MAGOXI9601, MAGOXI9700, MAGOXI9701, MAGOXI9800, MAGOXI9810, MAGOXI9811, MAGOXI9900, MAGOXI9901, MAGOXL1000, MAGOXM1000, MAGOXP0600, MAGOXP1000, MAGOXP1500, MAGOXP2000, MAGOXP3000, MAGOXP5000, MAGOXP9800, MAGOXP9801

Revision

5

Revision Date 28 Feb 2020

Key/Legend

< Less Than
> Greater Than
AICS Australian Inventory of Chemical Substances
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm² Square Centimetres
CO2 Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm³ Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m³ Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight