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Waitsia-01 Well Environment Plan Summary Document

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1.0 INTRODUCTION

1.1 Background

AWE Perth Pty Ltd is a wholly owned subsidiary of AWE Limited (“AWE”).

AWE Limited (AWE) proposes to drill the Waitsia-01 well, about 17.2 km east of Dongara and 367km north of Perth, Western Australia (Figure 1). The proposed Waitsia-01 site is located within cleared agricultural land (private) in the North Perth Basin within Permit L1 (Figure 2). This is a single vertical appraisal well and will be drilled to a planned total depth of approximately 3,560 mMDRT, with the objective of assessing information obtained during the recent Senecio-03 well. Core samples are planned to be taken across formations of interest followed by electric line logging. Should logging results indicate the well may be of future use, the well will be suspended with cemented casing to allow for future intervention operations (should they be required).

The Waitsia-01 drilling program is scheduled to begin during the first quarter of 2015.

This Environment Plan (EP) has been prepared to manage the Waitsia-01 well project in an environmentally responsible manner and gain required approval for undertaking the activity.

1.2 The Proponent

AWE is a publicly listed Australian-based petroleum exploration and production company. It produces gas and oil from onshore oil and gas fields in the Perth Basin and has an active onshore and offshore exploration program. AWE has a Perth office and field operations at the Hovea, Eremia, Xyris, Woodada, Mount Horner and Dongara fields which are approximately 360 km north of Perth.

In addition to their Western Australia operations, AWE has offices in Sydney, New Plymouth (New Zealand), Jakarta (Indonesia) and offshore field operations in Victoria (Australia), New Zealand and Indonesia.

AWE is the custodian of this EP and has overall responsibility for its implementation, compliance and revision.

1.3 Contact Details

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Figure 1 Map highlighting the Waitsia-01 location

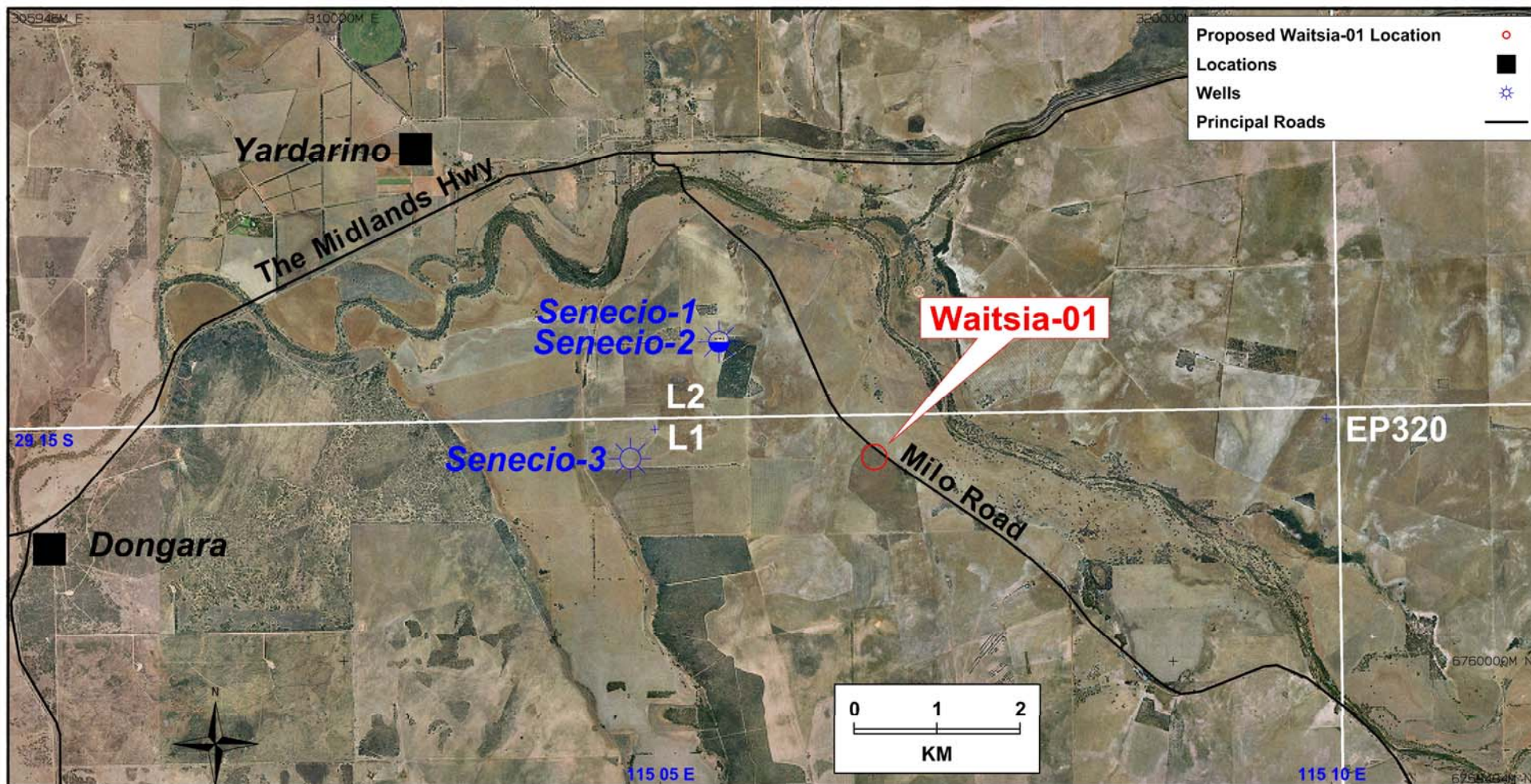


Figure 2 Map of Waitsia-01 location in relation to local sensitivities

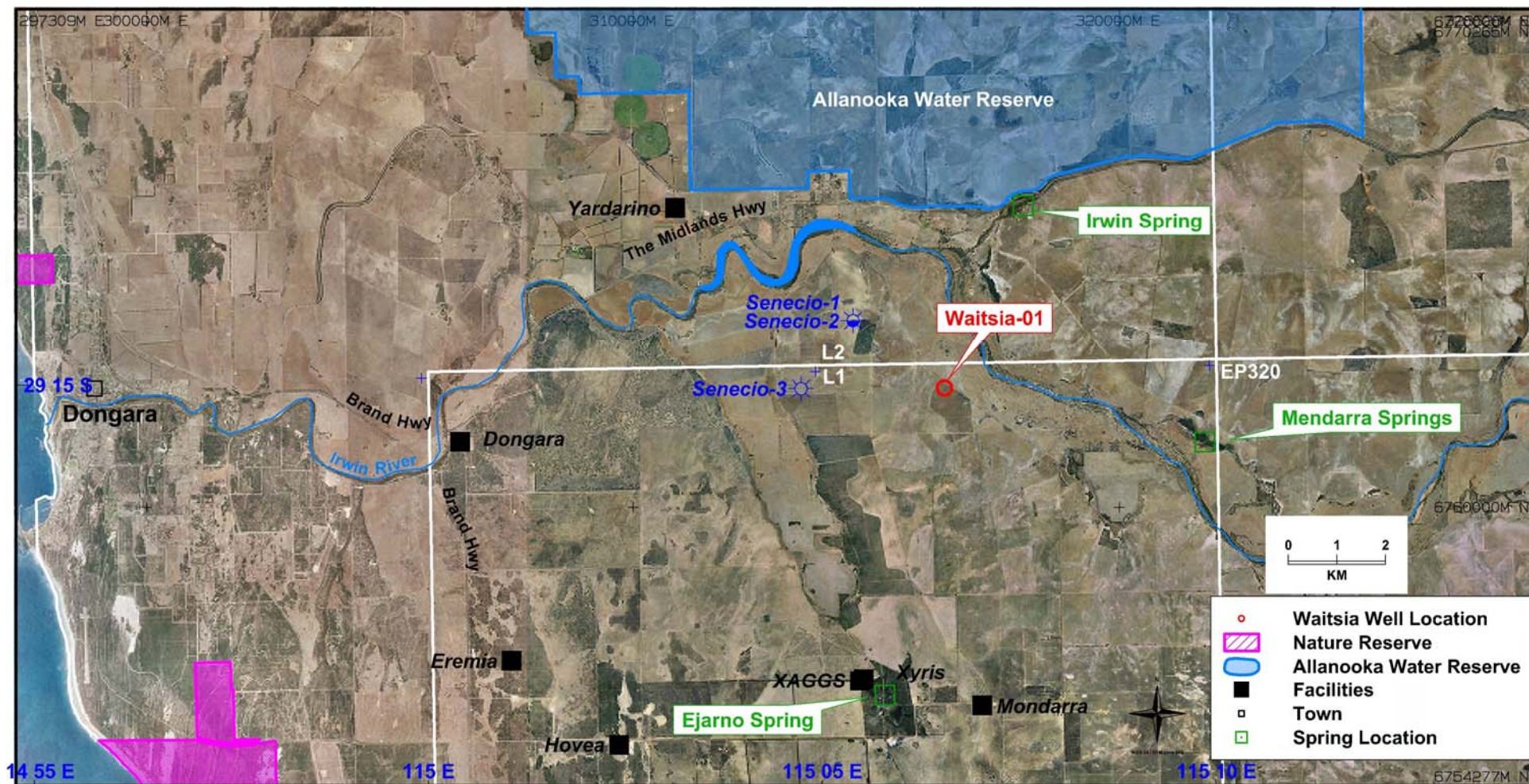


Figure 3 Map of Waitsia-01 location within L1 Permit Area

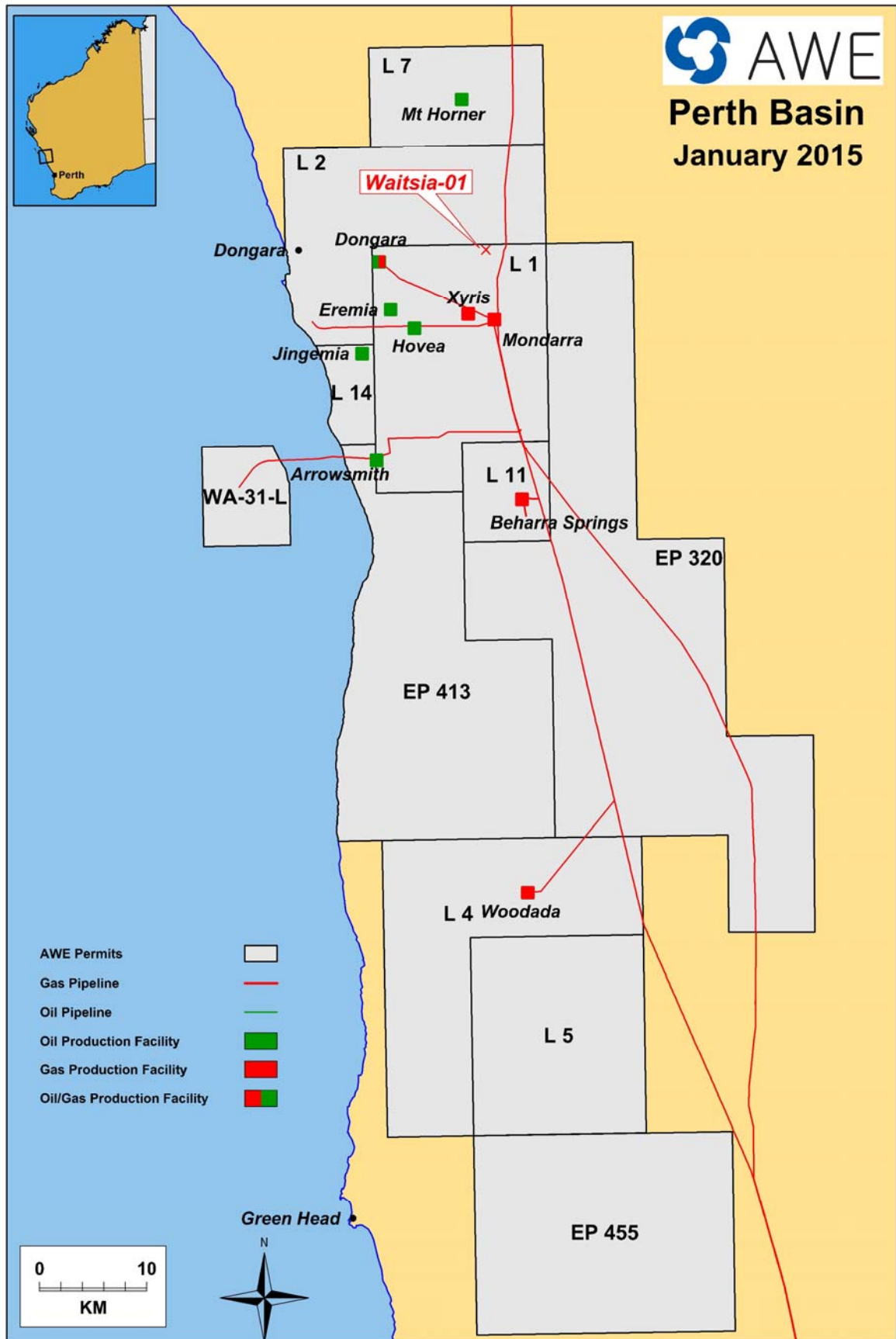


Figure 4 Site layout of Waitsia-01

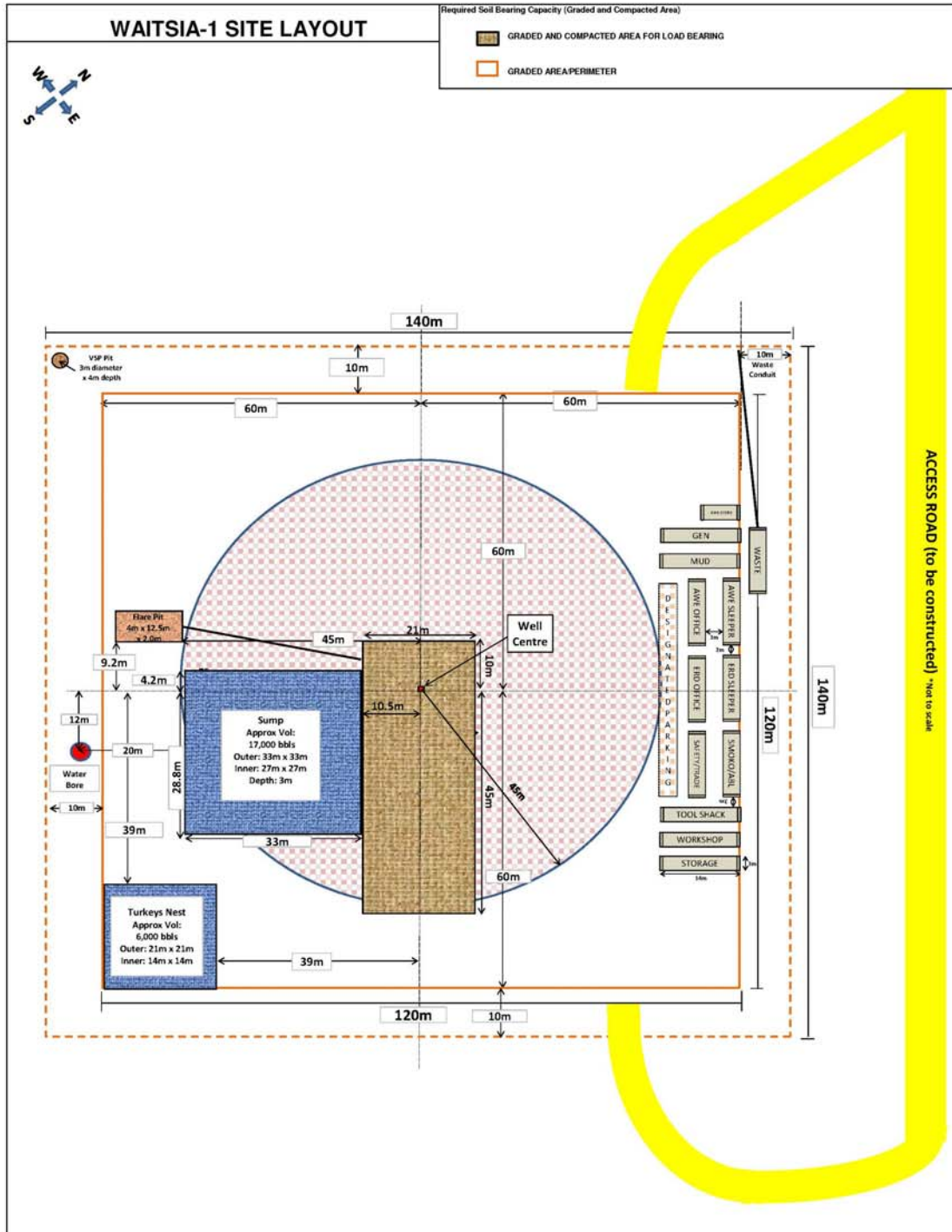
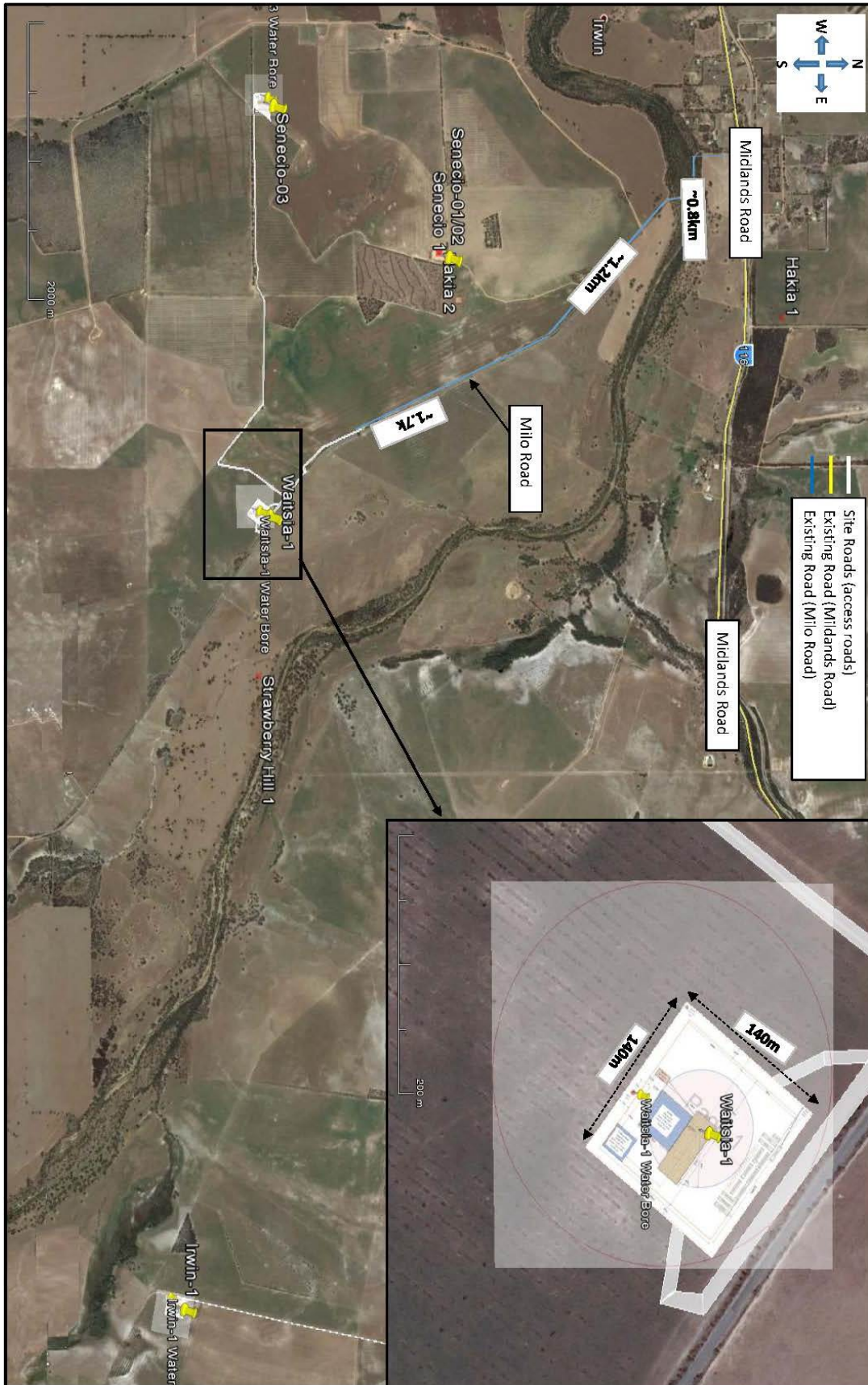


Figure 5 Waitsia-01 location and proposed access route



1.4 Purpose and Scope of this Environment Plan Summary Document

This EP has been written to meet the following objectives:

- Describe the environmental aspects of the Waitsia-01 well.
- Detail specific information on the environmental sensitivities of the receiving environment
- Identify potential environmental impacts of the Waitsia-01 well.
- Describe the control measures that will be implemented to minimise the environmental impact of the Waitsia-01 well and ensure that the environmental objectives are achieved
- Evaluate the environmental hazards and consequences associated with the Waitsia-01 well, assess the environmental risk levels and develop management measures to ensure risks are kept to an acceptable level
- To document this information
 - For implementation by AWE's employees and contractors
 - For use by regulatory authorities in the environmental assessment and approval process.

This EP has been prepared in accordance with the DMP 'Guidelines for the Preparation and Submission of an Environment Plan, Rev B, August 2012'.

2.0 DESCRIPTION OF THE ENVIRONMENT

A detailed description of the existing physical, biological, social, cultural and economic environment within the L1 Permit Area is included in the following section. Table 1 presents a summary of the receiving environment within a 3 km radius of the proposed well location.

Table 1 Description of receiving environment

Aspect	Description
Soil and Landform	Plateau residuals, very gently to gently inclined hillcrest and hill slopes; pale sandy gravels, shallow gravel over duricrust, gravelly pale deep sand, pale and yellow deep sands supporting heath. Project area within previously disturbed agricultural land.
Vegetation	Surrounding vegetation degraded by grazing.
Fauna	Sheep and cattle grazing predominates. Introduced mammals (black rat, rabbits, foxes, feral cats) and Western Grey Kangaroos may occur in the area. Various bird species found within area.
Social	Agricultural land use. No settlement within 2.5 km of drill site.
Cultural	No culturally significant sites within the project area.
Economic	Broad hectare cropping and grazing activities, oil and gas, tourism are the typical commercial activities in the area.
Distance to sensitive receivers	<ul style="list-style-type: none"> • Private Property Buildings: approximately 2.3km east from Waitsia-01 drill site. • Towns: Dongara is located approximately 17.2 km west of the Waitsia-01 drill site. • Water course: Irwin River is the nearest water body located approximately 1.0km north east of the site.

2.1.1 Climate

The proposed Waitsia-01 drilling operations will be located in the L1 Production Licence in the North Perth Basin, situated approximately 367 km north of Perth (Figure 1). The region has a Mediterranean-type climate characterised by seasonal patterns of hot, dry summers and mild, wet winters. The area is subject to high wind speeds, dust storms, lightning storms, high summer temperatures and low winter night temperatures.

2.1.2 Temperature and Rainfall

The average maximum temperature at Geraldton Airport ranges from 22.3°C in July to 37.6°C in February (BOM, 2013). Average minimum temperatures range between 6.4°C in August and 16.3°C in February (BOM, 2012).

Average precipitation levels at Geraldton ranges between 6.9 mm in January and 112.7 mm in July, while the mean number of rainy days is 80 days per year, with the majority falling between the months of May and September (BOM, 2012).

2.1.3 Soil

Soils within the Perth Basin are light and sandy and well drained. Beard (1976) described the soils as “calcareous sand soils of minimal development”. The soils consist of calcareous and siliceous sand underlain by aeolianite, which is often exposed. Four landform and soil zones are present within the region surrounding the Waitsia-01 drilling operation area. A ridge of young cemented Aeolian limestone with shallow yellow sand over limestone. In places the limestone is exposed and known locally as cap-rock. The limestone is cavernous and caves occur sporadically either as linear features along drainage lines, collapse structures over deeper caves or as shallow solution features on the surface which are scattered throughout the area.

- A line of water bodies mainly ephemeral lakes caused by the accumulation of water flows which are unable to reach the coast because they have been blocked by the elevated coastal limestone ridge. There are no open river channels locally and all water passes underground through the limestone ridge. These lakes have a variety of soils but are mainly humic or clay-based sands, or clay-based deposits.
- The Eneabba sand plain is a largely flat area of white sands which lie over variable clay loams.
- The base of the slope of the Dandaragan plateau is a sand plain mixed with lateritic rises which have shallow white sand over laterite or exposed laterite. This represents the Pleistocene shoreline weathering of the older and more elevated laterite plateau further to the east.

2.2 Surface and Ground Water Systems

A groundwater study has been undertaken for the area surrounding the Senecio gas prospects, which is equally applicable to the Waitsia-01 well.

The gas target reservoirs are expected to be at depths of greater than 2.6 km, with a total target depth of 3.56 km, far below base of the main regional aquifer beneath the site, the Yarragadee aquifer.

The Yarragadee aquifer is composed of over 1,250 m of sandstone and siltstone, and underlies about 20 m of surficial sediments at the sites. Available data indicate that groundwater levels across the gas prospects vary from about 75 m AHD to 50 m AHD; they are estimated to be 66 m AHD at the Waitsia-01 well site.

The hydraulic gradient is downwards towards the southwest. The derived data indicates that the depth to groundwater within the gas field varies from over 70 m bgl along the south western boundary to less than 5 m near the north eastern boundary where the Irwin River transects the gas field. Generally, areas where the topography is below 70 m AHD in the eastern half of the gas field and areas where the topography is below 60 m AHD in the western half of the gas field are estimated to have comparatively shallower depths to groundwater (<20 m bgl)

Groundwater salinity is typically fresh to marginal in the upper part of the Yarragadee aquifer. Formations which underlie the Yarragadee aquifer, such as the Cattamarra Coal Measures, Eneabba Formation and Lesueur Sandstone, which contain fresh groundwater in some other areas, occur at considerable depth at this location and are likely to contain brackish to saline groundwater.

It is estimated that the water table lies at less than 20 m depth beneath about 25% of the gas prospect area. Any naturally occurring vegetation in these areas would likely have been groundwater dependent but, other than along the banks of the Irwin River, the land over the gas field has been cleared for pastoral purposes. Along the northeastern boundary of the gas field, groundwater is expected to discharge from the Yarragadee aquifer as baseflow into Irwin River. Drawdowns will be negligible at the locations of the other mapped GDE's. It is also unlikely that the drawdown due to pumping from the Yarragadee production bore on the Waitsia drilling location would impact nearby river water flows or groundwater discharge into the river due to the small volume of groundwater that is likely to be extracted.

The Waitsia gas prospect spans the Twin Hills and Allanooka Sub-areas of the DoW's Arrowsmith Groundwater Area. There is moderate general groundwater use in the surrounding area but there is an allocation of 20 GL to the Water Corporation which is outside of the DoWs licensing system. The licensable component of the groundwater resources in the Yarragadee aquifer is currently 45% allocated in the Twin Hills Sub 1% allocated in the Allanooka Sub-area.

The drilling of Waitsia-01 well is estimated to use only small volumes of groundwater (up to about 2.5ML). This is a negligible percentage of the annual allocation limit for the Yarragadee aquifer in the Twin Hills and Allanooka Sub-areas and is lower than allocations associated with other groundwater licences in the region surrounding the gas prospect. Nearby groundwater users are unlikely to be impacted by the relatively minor amount of groundwater extraction for the proposed development.

Adverse risks to the groundwater and surface system are expected to be minimal but monitoring should be carried out to collect baseline data before commencement of activities at the Waitsia gas prospect and subsequent post-development data to allow assessment of potential effects on nearby water entities.

2.3 Acid Sulphate Soils

Waitsia-01 operations do not pose a risk of acid sulphate soils.

2.4 Conservation Areas and Nature Reserves

Significant conservation areas in the Perth Basin region include Red Book reserves, DPaW reserves, Nature Reserves and riparian vegetation.

2.5 Red Book

Red Book recommendations, released by the EPA between 1976 and 1984, were made on areas to be classed as conservation reserves. These EPA tenures are part of a listing of Crown Land areas identified in 'Conservation Reserves for Western Australia' and identify different systems which the EPA considered to be of environmental significance and proposed conservation areas.

There are no Red Book areas within the proposed Waitsia-01 project area. The nearest Red Book area is >20km from the Waitsia-01 location.

2.5.1 DPAW Reserves

The Department of Parks and Wildlife (DPaW) manages 23 million hectares of national parks, conservation parks, regional parks, nature reserves, state forest and timber reserves in WA. DPaW manages these areas for the conservation of biodiversity in ecosystems within these areas.

There are no reserves within the proposed Waitsia-01 project area. The nearest reserve is Yardonogo Nature Reserve location approximately 8km south of the Waitsia-01 location, this is the nearest significant native vegetated area.

The nearest riparian vegetation is located approximately 1 km north of the site along the margins of the Irwin river.

2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 and cover:

- Declared World Heritage property sites
- An area that is registered on the Register of the National Estate;
- A defined wetland and the area within 50 m of the wetland;
- The area covered by vegetation within 50 m of rare flora;
- The area covered by a threatened ecological community;
- Bush Forever sites;
- The areas covered by the following policies —
 - (i) the Environmental Protection (Gnangara Mound Crown Land) Policy 1992;
 - (ii) the Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002;
- The areas covered by the lakes to which the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 applies;
- protected wetlands as defined in the Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998;
- Areas of fringing native vegetation in the policy area as defined in the Environmental Protection (Swan and Canning Rivers) Policy 1997.

Waitsia-01 site is not located within close proximity to any identified ESA's. The nearest ESA is approximately 5km North East of the Waitsia-01 location.

2.7 Vegetation Communities and Flora

The Waitsia-01 well site is located within cleared agricultural land and there is no conservation significant flora within the immediate project footprint.

2.8 Weeds

A desktop study has been undertaken for the broader project area, The results of the NatureMap database search showed that one Weed of National Significance (Lycium ferocissimum – African Boxthorn) and one weed species that has been targeted for biological control (Echium plantagineum – Paterson’s Curse) have been previously located within the vicinity of the project area.

The EPBC Act search tool results listed two further WoNS, or their habitats, that could be likely to occur in the area, Asparagus asparagoides (Bridal Creeper) and Tamarix aphylla (Athel Pine).

To combat the spread of weeds, all vehicles entering the Waitsia-01 well site must adhere to the purpose built access paths once they have left sealed bitumen roads. Prior to site mobilisation all vehicles would be inspected, records of vehicle inspections would be maintained at the well site either by security personnel or the HSE representative.

2.9 Riparian Vegetation

The nearest riparian vegetation is located approximately 1 km north of the site along the margins of the Irwin river.

2.10 Dieback

Pathogen is not considered to be an issue for Waitsia-01 as it is not located in native vegetation. The nearest reported dieback infestation is within the Eneabba area approximately 65km south of Waitsia-01. Mobilisation routes would not be through dieback affected areas.

2.11 Fauna

There is no significant native fauna habitat which could be impacted by Waitsia-01 operations. Although protected fauna are known to reside within the broader region, the activity is within highly disturbed agricultural land, no clearing of native vegetation is proposed and the activity takes place over a limited period therefore impacts to native fauna are anticipated to be negligible.

2.12 Social Environment

The township of Dongara (to the west) is the largest population centre in the vicinity of the proposed Waitsia-01 well site.

Land use within the surrounding region is agricultural, consisting of wheat, sheep and cattle farming. The coastal areas support the commercial cray fishing industry. Dongara is the centre for a small oil and gas industry which began with the discovery of the Dongara Gas Field in 1966.

Nomadic Aboriginal people no longer reside in the area, although some maintain their links to the area.

2.13 Cultural Environment

AWE is committed to abiding by the provisions of the WA *Aboriginal Heritage Act 1972*. Field and desktop ethnographic surveys have been carried out to determine if operations are likely to impact upon areas of cultural heritage significance.

The following Aboriginal Heritage surveys have been completed within the vicinity (6km radius) of the Waitsia-01 well site:

- Aboriginal Heritage Survey of Proposed Irwin-01 Well Site prepared by R & E O'Connor Pty. Ltd. and elders and group members from the Amangu and Widi Mob native title claimant groups in May 2014.
- Aboriginal Heritage Survey of Proposed Senecio-03 Well Site prepared by R & E O'Connor Pty. Ltd. and elders and group members from the Amangu and Widi Mob native title claimant groups in November 2013.

The surveys comprised an inspection of the relevant ethnographic database, a consultative process involving the Amangu and Widi Mob groups and a field inspection of the drilling targets with representatives of those groups.

As a result of the survey it has been established that there are no Aboriginal heritage sites within or in close proximity to the proposed drilling targets.

It was therefore recommended that Aboriginal heritage considerations should not be deemed an impediment to the proposed drilling program proceeding as planned at the Waitsia-01 well site.

2.14 Economic Environment

The significant economic activities in the region include primary industries (agriculture and fisheries), oil and gas production, and broad hectare cropping and grazing activities. Other activities in the area include beekeeping and wildflower picking.

3.0 DESCRIPTION OF ACTIVITY

Table 2 presents specific information for the proposed Waitsia-01 well project while Section 3.1 describes specific information regarding the activities associated with each stage of the program.

Table 2 Design characteristics of the proposed Waitsia-01 well

Well Design Feature	Description
Site location and description	367km north- of Perth and 17.2km east of Dongara. The site is in agricultural farm land.
Permit	L1
Approximate Surface Hole Coordinates	Lat:29 15 12.06 S Long:115 06 37.88 E Easting: 316398 Northing: 6762465
Drilling timing	1 March 2015 – 30 April 2015
Planned Total Depth	TD: ~3,560mMDRT, ~3463.3mTVDSS
Drilling duration	40-55 days (maximum)
Clearing required	Not applicable. Land has already been cleared and is used for agricultural purposes.
Project footprint	<p><u>Work Pad:</u> 1.96ha (approximately) as shown within Figure 4. The flaring radius has not been taken into account as being part of the project footprint as flaring would only occur under emergency circumstances and be restricted to the period of drilling. The surrounding area is cleared agricultural land with broad cropping therefore we do not anticipate this will impact upon the surrounding agricultural activities. No land disturbance activities will be undertaken outside of the area indicated within Figure 4.</p> <p>A 150m radius firebreak has been included within Figure 4; this has been included as a contingency based on previous DFES advice. Should a firebreak be required it will be constructed in accordance with DFES requirements.</p> <p><u>Access road:</u> Existing Senecio-03 access track. The existing track will be extended by approximately 200m (5m wide).</p> <p><u>Total footprint:</u> 2.06ha (approximately)</p>
Drilling mud type	Water Based Mud (WBM).
Disposal of muds and cuttings	Water-based muds and cuttings discharged into a lined sump during drilling allowed to evaporate and chemically tested at the completion of drilling. Detailed soil investigations will determine method of disposal either in situ or within a licenced facility.
Drill rig	Tentatively planned as Enerdrill Rig 3
Proposed rig mobilisation route	Access to the proposed well site will be via Brand Highway, Midlands Road and Milo Road.

3.1 Waitsia-01 well

The drilling program will be approved by the DMP Resources Division prior to commencing drilling activities.

Drilling operations will be undertaken on a 24 hour basis using the Enerdrill Rig 3 drilling rig with a site layout as provided in Figure 4.

The proposed operation will include the following key stages:

- Preparation of access tracks, drill site, and flaring radius (if required by DFES).
- Levelling, sheeting and preparation of surfaces to support compressive loads and limit erosion.
- Construction of lined mud sump, turkey's nest and well cellar.
- Mobilisation of drilling package, ancillary services, site office, personnel and supplies.
- Conducting the exploration drilling activities.
- Demobilisation of drilling package, ancillary services, site office, personnel and supplies.
- Subsequent evaluation of the well, if required
- Restoration of the site following the completion of activities, as required.

3.1.1 Baseline Sampling

Baseline of soil and ground water samples will be collected prior to the commencement of drilling operations. The sampling will be conducted by a suitably qualified sample technician. The samples will be comprehensively analysed by a NATA accredited laboratory and copies of the analysis provided to the landowners and appropriate regulatory body.

3.1.2 Clearing Vegetation

The Waitsia-01 well does not require clearing of any native vegetation; the site is located within agricultural land which has been previously cleared.

3.1.3 Planned modifications to well site pad

Once the pad area has been prepared, the following activities will be undertaken:

- Grading of work site (1.96ha, see Figure 3), levelling of critical area around well site for drill rig, sheeting and compaction of heavy load bearing zone around well.
- Construction of lined mud sump (27m x 27m x 3m inner dimension).
- Construction of flare pit (4m x 12.5m x 2.0m outer dimension (approximate)) and turkey nest (21m x 21m x 3m outer dimension).
- Any other modifications, which might include;
 - Trenches, relief slope or similar means to prevent erosion and degradation of site from heavy rain events.
 - Additional surface compaction and or other remedial work for safe heavy vehicle movement where ground stability issues are discovered.
- Any work required to maintain the original site condition (post construction) as safe and environmentally effective should the site condition deteriorate due to use, weather or unplanned incident.

- Install fencing to deter ground-dwelling native fauna accessing the mud sump turkey nest and VSP pit.
- Topsoil will be stored away from operations in low profile mounds (<2m) to facilitate rehabilitation upon completion of exploration activities.
- A fence will be constructed around the perimeter of the well site (refer to Figure 4).
- Fauna egress matting will be installed within the ponds (mud sump and turkey's nest)

3.1.4 Mobilisation and Personnel Accommodation

The drilling package, ancillary services, personnel and supplies are mobilised by road to the Waitsia-01 project site.

There will be two site camps, a rig site camp and the main camp site. The majority of the workforce (up to 52 personnel) will be accommodated in an existing camp facility located on Pye Rd, which is ~34km from the Waitsia-01 well site via Midland Road and the Brand Highway. The camp is adjacent to the AWE operated Hovea Production Facility (HPF). Key drilling personnel required for immediate response to emergencies or to oversee critical operations will remain onsite at the rig site camp with beds for up to 8 persons.

3.1.5 Drilling exploration program

Once the drill rig is established, all activities associated with drilling (e.g. refuelling, batching of drilling muds and cement) will occur only on the drill pad.

The Waitsia-01 project involves the following key stages:

- Drilling the well with a rotary drilling rig using recirculated water-based mud (primarily Bentonite, Barite, KCl, NaCl and Polymer)
- Taking core samples from formations of interest.
- Conducting wireline logging evaluation of the formations drilled.
- Cementing well steel casing strings in place

Rotary drilling is the process of utilising a drill string and drill bit to break small pieces of rock and remove these pieces of rock from the hole by circulating a fluid (drilling mud) down the drill string and up the annulus between drill string and drilled hole. A blow out preventer (BOP) is used during drilling operations once at a depth where it is possible for hydrocarbons to be intersected. This BOP provides a mechanical means by which the well can be closed and secure the contents of the well should the mud system fail to maintain a positive pressure on the drilled hole. The proposed BOP is a 13-5/8" 10,000psi rated system, which is sufficient to allow us to drill through the prospective reservoir sections for Waitsia-01.

If hydrocarbons are intersected, and flow to surface was not prevented by the drilling mud, the BOP is closed allowing a controlled release of these hydrocarbons to a purpose built flare pit. Where drilling operations occur during restricted and total fire ban periods the flare pit and any firebreaks will be constructed in compliance with any specific DFES permit requirements.

Drilling activities for this project are anticipated to be conducted over a period of 40 - 55 days, which includes the mobilisation / demobilisation time. Noise and light disturbance to surrounding landowners is unlikely due to the remote location of the well, with the nearest sensitive receptor >2.3km away. The risk of noise/light disturbance will be managed through the following:

- Lighting will be directed within operational areas only.
- The site is sufficiently set back from the Midlands road which reduces visibility from nearby road users.

However, if noise or light disturbances are considered likely to occur, the AWE Drilling Supervisor will request that the AWE Landowner Liaison consults with the potentially affected landowner.

If dust becomes an issue then the following control measures may be implemented:

- Drill pad sprayed with water during drilling operations.
- On-site equipment or outside contractor used to manage erosion-affected areas.

3.1.6 Management of Drilling Muds and Cuttings

The drilling mud is designed to have many functions; it maintains a positive pressure on the wellbore preventing the wellbore from collapsing or sudden inflow of formation fluid to surface, it cools and lubricates the drill string and drill bit, and it lifts the drilled rock material to surface. The volume of drilling mud which is required is minimised by designing and maintaining the mud properties which inhibit its ability to invade into permeable formations (to prevent down-hole fluid loss), and by filtering and cleaning drilled cuttings and sediment from the mud at surface. This is done by processing the returned fluid through a solids control system. This system typically utilises “shale shakers” to remove large debris, followed by de-sanders, de-silters, and optional mud centrifuge which work to clean the mud further by removing fines. Removed cuttings and sand are placed directly into the drilling mud sump (i.e. there is no requirement to move cuttings with an excavator). A mud engineer periodically takes samples and measures various mud properties to ensure the mud’s drilling performance is maintained, is non-corrosive and is not bacterially degrading.

Recycling of mud limits the volume of water required to be taken from local ground water bores and the non-invasive mud design limits fluid loss to surface formations protecting ground water from contamination.

AWE will ensure a minimum freeboard capacity of approximately 0.5m is maintained within the mud sump and turkey’s nest throughout the course of operations. This is a volume sufficient to prevent any overflow as the average annual pan evaporation rate for the Perth basin is between 2000-2400mm whilst the average rainfall rates are approximately 600-800mm annually (BoM 2014).

Drilling muds and cuttings will be contained within a lined mud sump located adjacent to the well pad. AWE will implement the following measures enabling the risks to be managed to As Low As Reasonably Practicable (ALARP):

The water based muds planned for the Waitsia-01 well present a low risk to human health and the environment. The main substances to be contained within the mud pit include bentonite, potassium chloride, sodium chloride, barite, limestone and stone dust along with

the drill cuttings and water. These ingredients make up approximately 98% of the drill fluids. Although biocides, corrosion inhibitors and oxygen scavengers are present in minor quantities, all the return fluids will be contained within a lined mud sump for evaporation. The full disclosure of the drilling products and chemical constituents are contained within Attachment 5 – Chemical Disclosure.

- The mud sump will be lined with Enviro Liner 6030^{HD} liner (hereafter referred to as 'Enviro Liner') (Thickness: 0.75mm; Water Vapour Permeability 3×10^{-13} cm/sec); this will prevent the vertical migration of contaminants into the underlying soils or the aquifer. The Enviro Liner is the preferred option as the product is flexible, puncture resistant, resistant to UV exposure and suited for the storage of muds and cuttings.
- Soil baseline samples will be collected at the base of the proposed mud pit prior to drilling operations commencing to characterise the underlying soil. The sampling suite will likely include as a base case (but not limited):
 - o Inorganics: Soil pH, Ammonia, Chloride, Moisture, Nitrate, Nitrogen, Phosphorus, Phosphate, Sulfate, TKN (as N).
 - o Metals: Arsenic, Barium, Cadmium, Chromium (Hexavalent), Copper, Lead, Manganese, Mercury, Nickel, Thorium, Tin, Zinc.
 - o Hydrocarbons: Benzene, Ethyl benzene, Toluene, Xylene (BTEX), TPH (Aliphatic and Aromatic).
 - o Phenolics and Polycyclic Aromatic Hydrocarbons.

During site decommissioning, subsequent soil testing will be undertaken to determine if any contaminants are present in the soils. Dependent upon the results one or more of the following actions would be undertaken:

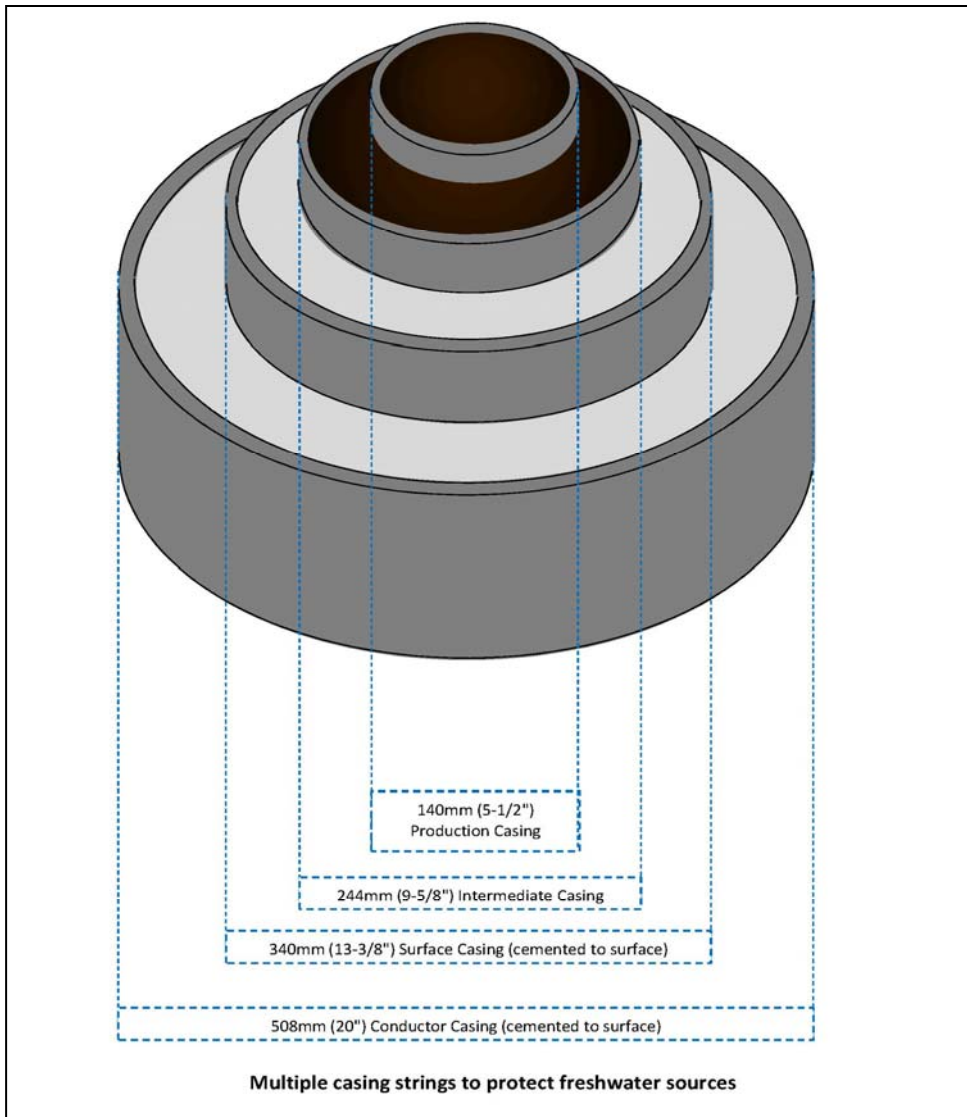
- o Excavation of the mud sump in part or whole, removing material for disposal within an licensed landfill facility in accordance with the Landfill Waste Classification and Waste Definitions 1996 (as amended) (DEC 2009),
- o Muds being mixed with clean fill and cuttings spread out around the lease area to dilute contaminant concentrations.
- o Validation soil sampling by a third party to ensure all material is excavated and no residual contaminants remain above the adopted guidelines.
- o Land farming of sump material across the existing lease to assist in biodegradation and reduce component concentrations allowing sump material to remain onsite.

3.1.7 Well Construction

The Waitsia-01 well will be constructed in accordance with the Waitsia-01 Drilling Program [TBA] which will be assessed and accepted by the DMP Petroleum Division prior to commencement.

Figure 6 illustrates a typical casing string cross section. These steel pipes are commonly referred to as Conductor Casing, Surface Casing, Production Casing, and in many active wells an innermost Production Tubing is also installed.

Figure 6 Waitsia-01 Conceptual Casing Schematic (Surface)



The Waitsia-01 well construction will be made up of multiple casing strings to serve the purpose of;

- Reaching formations of interest safely and allowing containment of hydrocarbons if intersected.
- Maintaining wellbore stability.
- Allowing zonal isolation (protection of freshwater aquifers and isolation of hydrocarbon bearing formations).

Casing strings are secured in place by cement, and both the casing and cement are designed to withstand the environmental conditions they will be exposed to during the life of the well. This means that each well will have customised casing and cementing programs. In the event no hydrocarbons of commercial value are intersected the well will be plugged and isolated with cement. All minimum casing and cementing requirements are set out within, and be will executed in accordance with, the *PGER Act 1967, Schedule of Onshore Petroleum Exploration and Production Requirements 1991*. Well construction detail will be outlined within the well's drilling program and approved by the DMP.

3.1.8 Surface and groundwater integrity

Physical barriers to protect fresh groundwater aquifers in the Waitsia-01 area include:

- The principle fresh water aquifer in the region is the Yarragadee aquifer. Groundwater salinity in the Yarragadee aquifer is typically fresh to marginal near the surface and increases to brackish at around 400 m depth. Formations which underlie the Yarragadee aquifer, such as the Cattamarra Coal Measures, Eneabba Formation and Lesueur Sandstone, which in other areas can contain fresh groundwater, occur at considerable depth at this location and are brackish to saline groundwater. All fresh water bearing sands will be isolated and protected by the cemented surface casing string.
 - o Fresh (good quality) water as defined by the Department of Water in WA contains <500 mg/L or ppm of TDS (Total Dissolved Salts). Saline water is >5000 mg/L. Australian drinking water guidelines indicate 1000 mg/L as an upper limit.
- The surface casing will run to a depth of approximately 760m protecting overlying freshwater aquifer. Although the surface casing does not run to the base of the Yarragadee this does not present a risk as subsequent cementation of the 9-5/8" intermediate casing isolates the deeper hydrocarbon bearing formations from the Yarragadee formation and leaves the annulus open as another means of monitoring back side pressure to prove no hydrocarbon contamination is occurring from deeper zones.
- In the event the well is suspended for future use with a production casing string, this string will be designed to meet any future pumping or producing activity requirements and cemented in place to provide a further integrity barrier for any freshwater aquifers.
- Casing integrity will be tested and monitored by pressure gauges within the innermost casing string and between casing annuli.

3.1.9 Monitoring

The project supply water will be obtained through a planned water bore which will be drilled down hydraulic gradient (south-west) of the Waitsia-01 well location. Department of Water approval will be obtained in the form of a 26D licence to construct and a 5C licence to take water required for the drilling activities.

The bore will be located approximately 60 metres south west of the well as shown within Figure 4. Once the project water bore has been established a representative baseline water sample will be collected prior to commencement of drilling operations. Subsequent groundwater water samples will be undertaken on a six monthly basis until the well is decommissioned.

Soil samples will be obtained prior to drilling activities and during rehabilitation for validation purposes.

3.1.9.1 VSP Operations

The Vertical Seismic Profiling (VSP) pit is a small cylindrical pit to be utilised during VSP operations. The pit is to be excavated on the south-eastern most boundary of the lease (off the hard stand area, prior to the fence boundary of the lease). The dimensions of the pit are as detailed the Figure 4 and reiterated below:

- 3m diameter (round), cylindrical hole 4m deep,

The excavated hole is to be lined with a cylindrical steel liner and located within 70 – 80m (straight line) from the well centre (conductor). The base of the pit will be concreted, and the pit filled with water. The VSP pit will be fenced to prevent small fauna access.

The logging truck will be put on location, with airguns lowered in and suspended in the pit, with the VSP (Vertical Seismic Profile – seismic measurements used for correlation with existing surface seismic data) data shot surveys then taken.

Following this the pit will be emptied (into the mud sump or other suitable location) and backfilled. The steel liner and concrete base would be removed from the sump prior to backfilling.

3.1.10 Demobilisation, Suspension and Rehabilitation

Should there be no significant hydrocarbon indications, the well will be abandoned by setting cement plugs in the open hole and at the surface in accordance with the *Schedule of Onshore Petroleum Exploration and Production Requirements – 1991*. The cellar will be removed and backfilled. An abandonment plaque will be posted in accordance with the *Schedule of Onshore Petroleum Exploration and Production Requirements - 1991*.

In accordance with clause 638 of the Schedule of Onshore Petroleum Exploration and Production Requirements - 1991 the site will be rehabilitated and restored as far as practicable to its original condition (in consultation with landowner).

The water within the drill mud sump will be allowed to evaporate and soil testing undertaken to determine appropriate method of disposal dependent on analysis. Once the well is abandoned, all excavations will be backfilled and the entire well site will be restored including the removal of road gravel and sheeting materials at the drill pad. The cleared surface will then be rehabilitated within two years of drilling or production activities, providing no further drilling operations are being contemplated.

Remediation of the site will be in accordance with a Rehabilitation Plan. The Rehabilitation Plan will outline the specific completion criteria for the site based on regulatory requirements and the landowner agreement.

Completion Criteria differs for each well decommissioning activity and is dependent on the location. On private farmland as applicable to the Waitsia-01 well the completion criteria would typically include the following:

- No Drilling related equipment or waste left on site,
- Gravel/marl sheeting material removed offsite for disposal in accordance with land access agreement (subject to Landfill Waste Classification),,
- Any stock piled subsoil and then topsoil respread,

- Stabilising agent applied to prevent erosion,
- Removal of liners associated with mud sump, water storage or chemical/hydrocarbon storage,
- Erected fencing removed,
- Collection of soil and water samples for analysis to compare with background (baseline) levels,
- Re-establishment of areas considered to be impacted by compaction
- Rehabilitation of borrow pit in accordance with land access agreement

Well site rehabilitation is not complete until the completion criteria stated within the site specific Rehabilitation Plan are achieved and the site is handed back to the landowner.

Site rehabilitation progress will be monitored until the completion criteria are achieved.

3.1.11 Chemical Disclosure for products, additives, chemicals and other substances

The DMP set out the requirements for chemical disclosure within the Chemical Disclosure Guideline released August 2013. It details the chemical disclosure requirements for products, additives, chemicals and other substances used 'down-hole' in petroleum or geothermal related activities regulated under regulation 15(9) of the:

- Petroleum and Geothermal Energy Resources (Environment) Regulations 2012.

The chemicals proposed for the Waitsia-01 program are disclosed within Attachment 5. The disclosure tables have been prepared in accordance with the guideline and the Chemical Disclosure Reporting template provided for within the guideline.

The chemical disclosure tables cover the following 'down-hole' activities:

- Drilling (Water Based Muds)
- Cementing

Contingent volumes are provided for within the Chemical Disclosure tables (Attachment 5) as highlighted in grey. The Manufactures Safety Data Sheets (MSDSs) for the chemicals associated with the Waitsia-01 activities are provided for within Attachment 6. Note: Where MSDS provided differs from the supplier, the product is considered the equivalent.

3.1.12 Utilities and Services

The utilities and services for drilling operations are described below.

3.1.13 Water

Water licences (26D and 5C) will be obtained from the DoW prior to undertaking drilling activities. The proposed water bore for the Waitsia-01 well will be located on the south west side of the well pad lease area. The water will be abstracted for drilling operations and also dust suppression during construction (if required), dust suppression activities would be limited to the area of the activity. The water source aquifer (Yarragadee) is typically fresh to marginal near surface (down to 400m) and suited to the activities proposed.

Water requirements for the well will be approximately 2.5 ML for this project. Due to the comparatively small volume (2.5 ML) that is proposed to be extracted for the water supply, water will be stored through the most economical and environmentally friendly means. For Waitsia-01 a 0.5mm LLDPE lined pond has been chosen in favour of above ground tank storage. AWE aims to select the most effective form of water storage specific to the project (considering the environment, safety, and cost). In the case of Waitsia-01, a lined pond is the smallest surface footprint option due to the volume of water being considered.

3.1.14 Sewage treatment

AWE will utilise a mobile Aerobic Treatment Unit (ATU) at the drill site to manage wastewater from the Rig Site Camp (which can accommodate 8 persons on site). The expected daily wastewater volume is approximately 1500 litres/day and the disposal system will involve surface irrigation of the treated waste water. The sprinkler system will be located adjacent to the onsite camp in an area removed from daily operations (Figure 4), this is labelled as waste conduit. This method of wastewater disposal is accepted by both the Department of Health and the local Shire as a safe way of recycling water, and is preferred over offsite disposal which would require regular visits from a waste contractor to pump out a septic system which introduces additional risks associated with the presence of another contractor on an operating drill site.

3.1.15 Refuelling

A vehicle mounted diesel tank will be utilised for refuelling during construction activities. Diesel fuel will be delivered by mobile diesel tanker to the main rig tank (42,000 litres). The main rig tank is double skinned. A skid based fuel cell transported by fork lift will distribute diesel to smaller stationary tanks (generators and lighting towers), the ancillary fuel cell is self banded. On site storage of hydrocarbon will be in accordance with AS 1940:2004.

The onsite refuelling procedure is as follows:

1. Stop engine prior to refuelling, personnel are to remain with equipment during refuelling;
2. A drip tray is to be used during all refuelling operations at the drill site;
3. A spill kit is to be available on the construction refuelling vehicle, the drill site refuelling trailer and the main rig tank;
4. Shutdown pump and secure hose after use; should any spills occur they are to be cleaned up and reported immediately.

The onsite refuelling will be in accordance with the Waitsia-01 Environment Plan [HSE-E-086] Rev 3.

3.1.16 Electricity

Portable on-site diesel generators will provide power for drilling and associated activities.

3.1.17 Offices and Storage Areas

AWE and the drilling contractor will provide portable offices for the project.

3.1.18 Instrumentation, Lighting and Cabling

All instrumentation, lighting and cabling will be installed in accordance with AS 3000:2007 regulations.

3.1.19 Security

The proposed well site will be fenced to deter third party access. Visitors to the well site will be required to report to the site office before entering the site.

3.1.20 Waste Disposal

Waste will be stored on site within signposted or designated areas and disposed via an approved waste disposal contractor in accordance with commitments outlined within the Waitsia-01 Environment Plan [HSE-E-086] Rev 3 and summarised below:

Table 3 Summary of waste disposal

Waste Product	Method of Disposal
Waste oil	Placed into empty oil drums and removed from site by Wren Oil, While stored on site, waste oil will be stored within a bunded area.
Wooden pallets	Placed into rubbish skip and removed off site by waste/recycling contractor
Mud sacks	Placed into rubbish skip and removed off site by waste contractor
Steel scraps (including steel casing protectors and drill line)	Placed in one central area after use/removal. Then placed into steel bin and removed off site by waste/recycling contractor.
Casing protectors (plastic)	Placed into rubbish skip and removed off site by waste contractor
Plastic products	Placed into rubbish skip and removed off site by waste contractor
Cigarettes	Disposed of to dedicated receptacle and removed off site by waste contractor.
Refrigeration gas	Recovered by licensed refrigeration electrician/mechanic and returned to authorised agent for disposal.
Food Waste	Placed into rubbish skip and removed off site by waste contractor
Tyres & rubber products	Placed into rubbish skip and removed off site by waste contractor
Cuttings/mud	The water within the muds and cuttings in the drill sump will be allowed to evaporate and soil testing undertaken to determine appropriate method of disposal (if required).
Grey / black water	Rig site: Mobile ATU (Anaerobic Treatment Unit) will be used to treat on site grey/black water, a sprinkler system (or similar) will be used to irrigate treated liquid wastewater. Main camp: Septic system with leach drain is installed within the main camp to manage grey/black water.
Batteries	Taken to nearest recycling centre.
Metal drums	Placed in central location and removed off site by waste contractor.
Drilling line	Placed into rubbish skip and removed off site by waste contractor

Waste Product	Method of Disposal
Contaminated Soil	Contained on site and removed by a licensed contractor to a licensed facility in accordance with Landfill Waste Classification and Waste Definitions 1996 (as amended) (DEC 2009).
Hazardous waste (solid)	Placed in appropriately labelled receptacles and removed off site for disposal by a licensed contractor at a licensed facility in accordance with Landfill Waste Classification and Waste Definitions 1996 (as amended) (DEC 2009).

3.1.21 Chemical Storage

Oil, fuel, and hazardous liquid chemicals are stored in the bunded chemical storage area on the drill pad. All chemicals will be stored in accordance with the requirements of their relevant material safety data sheets (MSDS). MSDSs for each chemical used and stored onsite are held in the site office and also in the chemical storage area.

On site oil, fuel, and hazardous liquid chemicals will be stored in accordance with AS/NZ 1940:2004 and bunded to contain not less than 110% of the volume of the largest vessel and at least 25% of the total substance stored (where more than one storage is connected to a common compound, drainage tank or similar storage vessel). Mixed classes of Dangerous Goods will be stored in accordance with AS3833:2007.

Empty chemical containers or drums are to be stored bunded within waste storage area.

3.1.22 Emergency Planning and Response

AWE maintains an up-to-date Drilling (SMS) Bridging Document (HSE-DR-015) that references and links to the following documents:

- AWE's Perth Basin Oil Spill Contingency Plan (OSCP) for Drilling and WIA [HSE-OP-030]
- Perth Basin Operations Emergency Response Plan [HSE-DR-016]
- Contractor Emergency Response Plan

AWE requires the drilling contractor to implement the AWE OSCP [HSE-OP-030] and requests that the Contractor prepares an Emergency Response Plan for the drilling operations. The Drilling Contractor will have a HSE Management Plan which includes details of the key processes of induction, safety meetings and reporting, Permit to Work system, job safety analysis (JSEA), hazard and management control and oil/chemical spill contingency. A copy of the EP and drilling manuals will be maintained in the site office at the well site.

Fire response equipment is to be available to construction crews, this may include:

- One (1) fire trailer with 1000 litre water tank fire hose and assembly during relevant restricted burning periods;
- Portable fire extinguishers (Dry Chemical, CO2 Extinguishers, AFFF foam Extinguishers).

All vehicles involved in pad construction to have a fire extinguisher in the vehicle.

3.1.23 Oil Spill Contingency Plan

AWE's Perth Basin OSCP for Drilling and WIA [HSE-OP-030] provides guidance in response to a hydrocarbon or chemical spill relating to Drilling or WIA operations within AWE's permit areas. The OSCP defines how the Perth Office and Field Teams will respond to a hydrocarbon/chemical spill incident in a manner which minimizes the impact on the environment and ensures safety of company personnel, the environment and the integrity of the facility. A copy of the OSCP will be held at the rig site.

Spill sources included in the scope of the OSCP include:

- Diesel tanks
- Vehicle accident
- Oil and chemical storage and handling
- Well blow out

4.0 MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

4.1 Management Controls for Key Environmental Risks

An Environmental Risk Assessment workshop was undertaken to identify environmental risks and to support the development of an Environment Plan (EP) in accordance with the PGER Act 1967 (PGER) for submission to the DMP for assessment.

There are a number of potential environmental impacts identified within the Risk Assessment which may result from the project activities, the management controls reducing the risk of impacts to ALARP are provided in Table 4 for the main risks. A summary of key environmental risks and mitigation strategies is provided within Attachment 1.

Table 4 Summary of Management Controls

Risk	AWE Management Control Measures
1. Flora	<ul style="list-style-type: none"> • To combat the spread of weeds, all vehicles entering the Waitsia-01 well site must adhere to the purpose built access paths once they have left sealed bitumen roads. • Equipment mobilised to site will arrive clean and free of organic material (exotic weeds and seeds).
2. Fauna	<ul style="list-style-type: none"> • Lighting is directed towards operation, light spillage on to surrounding areas minimised. • Fencing is provided around operational areas to exclude native and introduced ground dwelling fauna. • Fenced off drilling sump, groundwater supply turkey nest. • Installation of egress matting for ground dwelling fauna to escape from water storage ponds.
3. Waste	<ul style="list-style-type: none"> • All waste receptacles have lids or are covered. • All waste is segregated into general, steel or hydrocarbon waste. • Drilling muds to be disposed of within a sump, soil samples will be collected for analysis to determine appropriate method of disposal. • All waste is collected and disposed of offsite through licensed facilities (in accordance with Landfill Waste Classification and Waste Definitions 1996 (as amended) (DEC 2009)) and waste tracking records are retained. • No wastes will be left on site after completion of exploration activities.
4. Air Emissions	<ul style="list-style-type: none"> • Flaring is not planned during this project and required for emergency flaring situation only • Vehicles and machinery maintained regularly to ensure clean burning. • Water applied to areas prone to dust generation.
5. Noise	<ul style="list-style-type: none"> • Minimise heavy vehicle movement at night (unless under emergency circumstances) • Nearest sensitive noise receptor (landowner's house) is >3 km from the site.

Risk	AWE Management Control Measures
6. Light	<ul style="list-style-type: none"> • Lighting will be directed within operational areas only. • Nearest sensitive light receptor (landowner's house) is >3 km from the site. • The site is sufficiently set back from Midlands road which reduces visibility from nearby road users.
7. Surface Water Management	<ul style="list-style-type: none"> • Water storage ponds are lined (minimum infiltration rates 10⁻⁹ m/s). • Drainage systems in place to reduce erosion and minimise run off from drilling package. For example surface drainage immediately surrounding the rig would be directed to the mud sump through small channels dug to facilitate water movement to the sump.
8. Groundwater Management	<ul style="list-style-type: none"> • Groundwater Study commissioned and prepared by Rockwater hydrogeological consulting. • Well construction designed to protect freshwater aquifers. • Abstraction licence from DoW for production bore.
9. Fire	<ul style="list-style-type: none"> • 1000 litre firefighting trailer on site during restricted burning months • Land & vegetation cleared around the flare pit as per DFES's total fire ban exemption requirements, if required. • Permit to Work (PTW) to control ignition source(s) & all equipment are appropriately hazard zone rated. • Have gas detectors. • Remote and manual ESDs. • All vehicles involved in pad construction to have a fire extinguisher in the vehicle.
10. Heritage Management	<ul style="list-style-type: none"> • Two contracted monitors will be on site during initial earthworks. • Aboriginal heritage survey completed for previous wells (Senecio-03 and Irwin-01 which apply to Waitsia-01 well), survey involved an inspection of the relevant ethnographic database and a consultative process involving the Amangu and Widi Mob groups (including a field inspection).
11. Drilling activities	<ul style="list-style-type: none"> • Drilling operations personnel accommodated in both onsite and offsite camps to reduce travel associated risks. Camp wastes disposed of within licenced facility or collected by licenced contractor for disposal (i.e. general waste, food waste). • Volume of drilling mud use minimised by non-invasive mud design limiting fluid loss to surface formations protecting groundwater from contamination. • BOP in place once drilling operations reach a depth where hydrocarbons can be intersected. • Drilling muds to be contained within an 'Enviro Liner' lined mud pit, soil samples will be collected for analysis to determine appropriate method of disposal. • Recycling of mud limits the volume of water required to be taken from local ground water bores. • All drilling fluids are contained within the rig contractor's mud system. This system is constantly monitored by personnel and pit level

Risk	AWE Management Control Measures
	sensors for volume changes. The mud tanks are aligned with the mud sump to allow dumping of their contents into the mud sump at any time.
12. Socio-economic impacts	<ul style="list-style-type: none"> • Local contracts are utilised for initial earthworks, water bore drilling and labour hire providing employment opportunities. • The main camp site to house the various contractors associated with the project is located on Pye Road within the Bonnie Rock campsite. This is an existing facility which reduces the foot print within the drill site. • The AWE lease area for the Waitsia-01 site has been designed around the Landowner's requirements, the surrounding land is used for agricultural activities and the shape of the lease area is worked around landowner requirements. • Utilisation of shared vehicles will minimise vehicle movement onsite and on access tracks as much as practical, minimising local traffic and vehicle related safety and environment risks.

5.0 MANAGEMENT APPROACH

The Waitsia-01 exploration activities will be managed in accordance with the commitments outlined with the Waitsia-01 Exploration Well Environment Plan [HSE-E-086] Rev 3. For the purposed Waitsia-01 exploratory activities; there are no additional risks or impacts above or beyond the accepted EP.

The primary goal of the implementation strategy is to ensure the environmental objectives of the Waitsia-01 Environment Plan are achieved. The implementation strategy outlined within the accepted Environment Plan includes:

- Systems, practices and procedures
- Training and competencies
- Monitoring, auditing, management of non-conformance and review
- Emergency response (including oil spill contingency plan)
- Record keeping
- Reporting (Routine and Incident)
- Consultation with key stakeholders

The feasibility, planning and assessment of all drilling campaigns are undertaken within the framework of the AWE SMS, which incorporates environmental management.

The key elements of the SMS include:

- a. The matching of legal obligations to the practical needs of all operations.
- b. The assignment of responsibilities required to meet the commitments set out in the AWE Policy.
- c. A common measurement process to check that standards are complied with.
- d. Thorough feedback processes, the encouragement of improvement in process and performance.
- e. Appropriate and comprehensive documentary support.
- f. Application to all levels and areas of the organisation (including work by contractors), and to all working conditions and any activities that may have the potential to affect the health and safety of people or harm the environment.

All the relevant HSE procedures within AWE's SMS that are applicable to drilling are outlined as follows:

Table 5 Relevant HSE Procedures

Procedure	Objective of Procedure	Location
Code of Practice for AWE Drilling sites	To outline the main HSE criteria to be observed at AWE. It is intended that personnel following these criteria will be in a position to prevent a mishap rather than react to one.	AWE Health Safety & Environment Policy (AWE-HSE-POL-001_7) AWE Drug and Alcohol Policy (Adopted by AWE Board 24 June 2013)
HSE Management System	To demonstrate that the HSE Management Systems (MS) of AWE and the drilling contractor are comprehensive and compatible, and to identify which is applicable in cases of actual or potential overlap.	AWE Drilling HSE MS Bridging Document for the 2014 Drilling campaign
Emergency Response	To ensure that AWE has an effective emergency response management and recovery system.	AWE 2014 Drilling Campaign ERP Drilling contractor ERP
Emergency Shutdown	To ensure effective shutdown response to emergency situations.	Drilling contractor standard operating procedures and systems
Hydrocarbon Spill (non-emergency)	The AWE OSCP [HSE-OP-030] provides instruction on response to a hydrocarbon spill or leak at Drilling contractor Rig.	Drilling contractor ERP AWE OSCP (HSE-OP-030) This EP
Incident Investigation and Reporting	To ensure that a system exists for all employees to report all health, safety and environmental incidents and to ensure that all incidents are investigated to an appropriate level.	AWE Drilling HSE MS Bridging Document for the 2014 Drilling campaign
Drilling Contractor's Site HSE Manual	To ensure that AWE's HSE requirements are implemented during the drilling program. To ensure that the drilling contractor has suitable processes for inductions, hazard and management control and emergency response.	AWE Drilling HSE MS Bridging Document for the 2014 Drilling campaign Drilling contractor Site HSE Manual

6.0 CONSULTATION

AWE's HSE Statement of Principles states "AWE's objective is to benefit the communities in which we conduct our operations". To achieve this objective, we recognise we must build a climate of consent, which underpins our operating licences and creates the opportunity to benefit our communities. This means we must earn the confidence of government bodies, other influential stakeholders, the communities within which we operate, and the general public.

A summary of stakeholder engagement undertaken for the Waitsia-01 well is provided in the following table, this is not exhaustive and AWE are committed to ongoing consultation throughout the life of the project.

Table 6 Summary of stakeholder engagement

Stakeholder	Issues and resolution	Timing
Landowner	AWE acquired the Irwin Park farm within which the Senecio/Waitsia gas prospect is located.	October 2014
Adjacent Landowner (~2.5km west of west site)	Consultation in regard to proposed drilling activities.	January 2015
Department of Mines and Petroleum – Petroleum Division	Work Programs: Drilling application and program to be submitted Q1 2015	Planned Q1 2015
Department of Fire and Emergency Services (DFES)	Advice on fire breaks for flaring activities. Contacted DFES in regard to fire ban exemption application. No further issues raised.	November 2014
	Submission of Fire Ban exemption application to DFES	December 2014
	Section 22C/25A Exemptions issued by DFES. Standard conditions have been set for the operation. No further issues raised.	February 2015
Department of Mines and Petroleum- Petroleum Environment Branch	Briefing on Waitsia-01 drilling timeline and AWE's drilling program for 2015.	December 2014

Stakeholder	Issues and resolution	Timing
Department of Water (DoW)	Briefing on Waitsia-01 drilling timeline and AWE's drilling program for 2015.	December 2014
	<p>AWE provided an overview of the proposed activities for 2015.</p> <p>Topics included:</p> <ol style="list-style-type: none"> 1. Waitsia-01 monitoring program: 2. Waitsia hydrogeological study 3. DoW requirements for assessment of activities 	January 2015
	Rockwater Hydrogeological Consultants prepared additional summary information on the hydrogeological regime relevant to the Waitsia field to AWE and DoW.	March 2014
Local Aboriginal Groups - Amangu/ Widi Mob	<p>Engaged local Aboriginal groups to assist in site heritage survey for Irwin-01 and Senecio-03 well sites</p> <p>As a result of the survey it has been established that there are no Aboriginal heritage sites within or in close proximity to the Irwin-01/Senecio-03 or Waitsia-01 well sites.</p>	November 2013/ May 2014
Aboriginal Heritage Consultant – Anthropologist. R & E. O'Connor Pty. Ltd.	AWE received professional advice that another (heritage) survey would not be warranted.	December 2014
	<p>AWE advised the Heritage Consultant that the Waitsia-01 location moved further east and received the following advice:</p> <ul style="list-style-type: none"> - AWE should seek advice from the Registrar of Aboriginal Sites (Registrar) at the Department of Aboriginal Affairs (DAA) in regard to the new location. 	February 2015
Department of Aboriginal Affairs	<p>Advice on Waitsia-01 location in regards to heritage sites.</p> <p>Confirmation that there are no heritage sites within the immediate project footprint.</p>	March 2015

Stakeholder	Issues and resolution	Timing
<p>Various stakeholders including:</p> <ul style="list-style-type: none"> - Regulatory (DMP) - Local community - Indigenous groups - Media - Interested NGOs - Industry groups 	<p>Distribution of Waitsia-01 project flyer to all identified stakeholders.</p>	<p>TBA</p>
<p>Shire of Irwin</p>	<p>Bonnie Rock Transport (BRT) who manage the Pye Road camp confirmed with Shire of Irwin that all necessary approvals for in place for operation of Pye Road septic system and mobile ATU system.</p>	<p>November 2014</p>
	<p>Planning application for mobile rig camp submitted to Shire. Awaiting planning approval timeframe is usually one month from submission.</p>	<p>March 2015.</p>
<p>Joint Venture Partner</p>	<p>Negotiations on the Waitsia-01 location, decision made to move site further east of the original location.</p>	<p>January 2015</p>

7.0 ATTACHMENTS

Attachment 1
Risk Mitigation Strategies Summary

Activity	Risk Identification		Risk Analysis		Risk Evaluation (Post Treatment)	Risk Treatment
	Aspect	Causes	Consequence	Likelihood	Risk Ranking	Existing Safeguards/ Management Methods
1. All phases of activity	Nearby resident hyper sensitive to any air pollutants	Mobilisation of equipment Drilling operations Earthmoving equipment	2	5	High 7	<ul style="list-style-type: none"> - Baseline monitoring - Stakeholder engagement
2. Mobilisation and demobilisation of rig and site setup	Waste management and disposal (solid)	Disposal of non-hazardous wastes produced during mobilisation and demobilisation	1	4	Medium 5	<ul style="list-style-type: none"> - Use of waste receptacles - Specific waste segregation. (There are a few waste disposal contractors in the area that are geared for this kind of operations). - Site inductions. - Waste tracking receipts retained. - Drilling muds contained within an 'Enviro Liner' lined sump, muds tested and assessed against Landfill Waste Classification Guidelines.
3. Physical presence (transport)	Landowner and Public health and safety	Transport of workers, materials, and equipment to and from site (38 approx. per day for 30 days)	4	1	Medium 5	<ul style="list-style-type: none"> - Escorted vehicles as per regulations - If during wet season, assessment of flood risks will be taken into account for operations. - Crew change bus used to transport bulk of personnel between site and camp
4. Physical presence (transport to site)	Road congestion and increased risk to public safety (road users)	Transport of workers, materials, and equipment to and from site. During all phases of the project, with peak movement during mob/ demob of drilling activities	5	1	Medium 6	<ul style="list-style-type: none"> - Existing Travel Management Plan or Rig Mobilisation Plan. Drilling rig mobilisation usually travelling in convoy to reduce the likelihood of multiple collisions with local fauna. AWE or contractor will develop strict vehicle speed limit within the landowner's property with reminder signs displayed at prominent locations. AWE in conjunction with the drilling company will roll out an operation site specific Emergency Response Plan (ERP). - Where the main camp is a significant distance from the rig site then there will be a dedicated bus service to transport crew to / from the well site. Other mitigation / prevention measures include but not limited to (a) defensive driver training, (b) fatigue management guideline, (c) Fit for work policy
5. Subsurface loss of containment (e.g. during drilling (well blowout))	Aquifer contamination	Poor well integrity	4	1	Medium 5	<ul style="list-style-type: none"> - Double barrier philosophy. Surface and intermediate casing cemented across all freshwater aquifers. - Minimise chance of blow out (well designed and constructed in accordance with good oil field practice including well control procedures and drills, sufficient kick tolerance, casing design and adequate mud weight).

Attachment 2
Waitsia-01 Chemical Disclosure

A. System Details

Operator	AWE Perth Pty Ltd
Project/Well	Waitsia-01 Well
System	AWE Class G Slurry (Cementing)
Total Volume of System (L)	79, 485

B. Product List

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
Freshwater	On site bore	Base fluid	No hazard this is freshwater.	10.1946%	N/A
Cement- Class G	Halliburton/ABC	Cement	<p><u>Acute Toxicity:</u> <i>Portland cement as an ingredient (60-100%)</i> Fish Toxicity LC50 (96h): 41.2 mg/L (<i>Oreochromis niloticus</i>) Source: Adamu et al. 2008 <i>Synthetic amorphous silica as an ingredient (30-60%)</i> Fish Toxicity 96h LL0: 10,000 mg/L (<i>Branchdanio rerio</i>) Crustacean Toxicity 24h EL50: >10,000 mg/L (<i>Daphnia magna</i>) Na-Al silicates: Fish Toxicity 96h LL0: 10,000 mg/L (<i>Branchdanio rerio</i>); Algae Toxicity 72h NOEL:10,000 mg/L (<i>Scenedesmus subspicatus</i>) Source: IUCLID 2000 Addition of large amounts of cement to water may, however cause a rise in pH and may, therefore be toxic to aquatic life under certain circumstances.</p> <p><u>Chronic Toxicity:</u> Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and</p>	62.2525%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p>reduced pulmonary function. Individuals with silicosis are predisposed to develop tuberculosis.</p> <p><u>Biodegradation/bioaccumulation:</u> Biodegradation not applicable as cement is intended to remain long term in well and will be inert.</p>		
Econolite Liquid	Halliburton	Cement Additive Stabiliser	<p>CONSTITUENT 1 (≤60%): Crustacean Toxicity 100h EC50: 247 mg/L (Daphnia magna); Acute Fish Toxicity 96h LC50: 301-478 mg/L (Lepomis macrochirus); LD50:2000-3000 mg/kg (Rat) Component is an inorganic substance with "No bioaccumulation potential"; "studies on biodegradation are not applicable." Source: IUCLID 2000 PLONOR Bioassay testing where LC50/ EC50: >100mg/L Readily biodegradable</p> <p>CONSTITUENT 2 (≤100%): No Hazard (Water)</p>	9.2851%	Yes
Gascon 469	Halliburton	Stability agent to control free water	<p><u>Acute Toxicity</u> LD50: > 15,000 mg/kg (Rat) <i>Silica, amorphous as an ingredient (10-30%)</i> Oral Toxicity LD50: >10,000 mg/kg (Rat) Dermal Toxicity LD50: >5,000 mg/kg (Rabbit) Crustacean Toxicity EC50 : >1,000 PPM (daphnia magna) (24-hours acute immobilization test) Fish Toxicity EC50: >10,000 PPM (rainbow trout) (4-days static study). Fish Toxicity EC50: >10,000 PPM (freshwater fish) (96-hours static acute toxicity study) Fish Toxicity LD50 (Carp)= 10,000 mg/L/72 hrs <i>Sodium Hydroxide as an ingredient (<1%)</i></p>	8.5113%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			Algae Toxicity EC50 (72h): >100 mg/L (<i>Skeletonema costatum</i>) Fish Toxicity LC50 >100 mg/L (<i>Scophthalmus maximus</i>) (juvenile turbot) Crustacean Toxicity LC50 (48h)>100 mg/L (<i>Acartia tonsa</i>) Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. Negative for Reproductive or Developmental Toxicity <u>Biodegradation/bioaccumulation:</u> Sodium Hydroxide as an ingredient (<1%) is readily biodegradable. Silica, amorphous as an ingredient (10-30%) is not biodegradable		
HR-6L	Halliburton	Delays cement hydration reaction, low temperature	<u>Acute Toxicity</u> Retarder Algae Toxicity EC50 (72h): >100 mg/L (<i>Skeletonema costatum</i>) Fish Toxicity LC50 (48h): >100 mg/L (<i>Scophthalmus maximus</i>) (juvenile turbot) Crustacean Toxicity LC50 (48h): >100 mg/L (<i>Acartia tonsa</i>) <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Slowly biodegradable	1.3375%	Yes
CFR-3L	Halliburton	Friction Reducer	<u>Acute Toxicity</u> Acute Algae Toxicity 72h EC50: >3300 mg/L (<i>Skeletonema costatum</i>) Acute Crustacean Toxicity 48h LC50: 1687 mg/L (<i>Acartia tonsa</i>) CFR-3L is CFR-3 in solution LD50: 8670 mg/kg (Rat)	0.9700%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p><u>Biodegradation/bioaccumulation:</u> Log Pow: <0 (OECD 117) Biodegradation(28 Days): 5% (Marine BODIS)</p>		
Halad-413L	Halliburton	Reduces filtrate loss across permable formations	<p><u>Acute Toxicity</u> Oral Toxicity LD50: > 5,000 mg/kg (Rat) Dermal Toxicity LD50: > 2,000 mg/kg (Rabbit) <i>Humic acids, sodium salts, polymers with N,N-dimethyl-2-propenamide, sodium 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-1-propanesulfonate (1:1) and 2-propenenitrile, sodium bisulfite-terminated as an ingredient (10-30%)</i> Algae Toxicity EC50 (72h): 1,102 mg/L (Skeletonema costatum) Crustacean Toxicity LC50 (48h): >2,000 mg/L (Acartia tonsa) Fish Toxicity LC50 (96h): >1,000 mg/L (Scophthalmus maximus) (juvenile turbot) Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Slowly biodegradable. <i>Humic acids, sodium salts, polymers with N,N-dimethyl-2-propenamide, sodium 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-1-propanesulfonate (1:1) and 2-propenenitrile, sodium bisulfite-terminated As an ingredient (10-30%)</i> Log Pow: <0 (OECD 117) Biodegradation (28 Days): 6.1% (OECD 306)</p>	7.2954%	Yes
NF-6	Halliburton	Reduces air entrapment	<p><u>Acute Toxicity:</u> Not determined for Fish, Crustaceans and Algae as a complete mix.</p>	0.1536%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
		into cement slurrer	Rape oil as an ingredient (60-100%) Oral Toxicity LD50: >5,000 mg/kg (Rat) Dermal Toxicity LD50: >5,000 mg/kg (Rabbit) Fish Toxicity LC50: >5,600 mg/L Algae Toxicity EC50: >3,200 mg/L <i>Monopropylene glycol monooleate as an ingredient (5-10%)</i> Fish Toxicity LC50: 3,200 mg/L Algae Toxicity EC50: 990 mg/L <i>Sorbitan, monopalmitate as an ingredient (1-5%)</i> Fish Toxicity LC50: >,1800 mg/L Algae Toxicity EC50: 41 mg/L <i>Aluminium stearate as an ingredient (1-5%)</i> Fish Toxicity LC50: >5,600 mg/L EC50: 6,500 mg/L Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Readily biodegradable. Low bioaccumulation potential due to rapid degradation.		
Total				100.00%	

C. Chemical List

Chemicals	CAS number	Mass fraction (%)
Mix Water	NA	10.1946%
Portland cement	65997-15-1	52.2916%
Water in Product	7732-18-5	22.7022%
Sodium silicate	1344-09-8	4.6796%
Silica, amorphous - fumed	7631-86-9	4.2897%

Chemicals	CAS number	Mass fraction (%)
Crystalline silica, quartz	14808-60-7	2.6146%
Humic acids, sodium salts, polymers with N,N-dimethyl-2-propenamide, sodium 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-1-propanesulfonate (1:1) and 2-propenenitrile, sodium bisulfite-terminated	473268-27-8	1.8384%
Sodium Lignosulfonate	8061-51-6	0.6741%
Sulfurous acid, monosodium salt, polymer with formaldehyde and acetone	40104-76-5	0.4889%
Rape Oil	8002-13-9	0.1270%
Sodium hydroxide	1310-73-2	0.07149%
Monopropylene glycol monooleate	1330-80-9	0.01290%
Sorbitan, monopalmitate	26266-57-9	0.006451%
Aluminium Sterate	637-12-7	0.006451%
Total		100.00%*
*Mass fraction of total volume, inclusive of contingent volume.		

A. System Details

Operator	AWE Perth Pty Ltd
Project/Well	Waitsia-01 Well
System	AWE HTB Slurry (Cementing)
Total Volume of System (L)	55,6395

B. Product List

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
Freshwater	On site bore	Base fluid	No hazard this is freshwater.	9.5595%	N/A
Cement- Class G + 35% SSA-1	Halliburton	Cement	<p><u>Acute Toxicity:</u> <i>Portland cement as an ingredient (60-100%)</i> Fish Toxicity LC50 (96h): 41.2 mg/L (<i>Oreochromis niloticus</i>) Source: Adamu et al. 2008 <i>Synthetic amorphous silica as an ingredient (30-60%)</i> Fish Toxicity 96h LL0: 10,000 mg/L (<i>Branchdanio rerio</i>) Crustacean Toxicity 24h EL50: >10,000 mg/L (<i>Daphnia magna</i>) Na-Al silicates: Fish Toxicity 96h LL0: 10,000 mg/L (<i>Branchdanio rerio</i>); Algae Toxicity 72h NOEL:10,000 mg/L (<i>Scenedesmus subspicatus</i>) Source: IUCLID 2000 Addition of large amounts of cement to water may, however cause a rise in pH and may, therefore be toxic to aquatic life under certain circumstances.</p> <p><u>Chronic Toxicity:</u> Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of</p>	62.1130%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			breath, wheezing, non-specific chest illness, and reduced pulmonary function. Individuals with silicosis are predisposed to develop tuberculosis. <u>Biodegradation/bioaccumulation:</u> Biodegradation not applicable as cement is intended to remain long term in well and will be inert.		
Gascon 469	Halliburton	Stability agent to control free water	<u>Acute Toxicity</u> LD50: > 15,000 mg/kg (Rat) <i>Silica, amorphous as an ingredient (10-30%)</i> Oral Toxicity LD50: >10,000 mg/kg (Rat) Dermal Toxicity LD50: >5,000 mg/kg (Rabbit) Crustacean Toxicity EC50 : >1,000 PPM (daphnia magna) (24-hours acute immobilization test) Fish Toxicity EC50: >10,000 PPM (rainbow trout) (4-days static study). Fish Toxicity EC50: >10,000 PPM (freshwater fish) (96-hours static acute toxicity study) Fish Toxicity LD50 (Carp)= 10,000 mg/L/72 hrs <i>Sodium Hydroxide as an ingredient (<1%)</i> Algae Toxicity EC50 (72h): >100 mg/L (Skeletonema costatum) Fish Toxicity LC50 >100 mg/L (Scophthalmus maximus) (juvenile turbot) Crustacean Toxicity LC50 (48h)>100 mg/L (Acartia tonsa) Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. Negative for Reproductive or Developmental Toxicity <u>Biodegradation/bioaccumulation:</u> Sodium Hydroxide as an ingredient (<1%) is readily biodegradable.	6.2906%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			Silica, amorphous as an ingredient (10-30%) is not biodegradable		
CFR-3L	Halliburton	Friction Reducer	<p><u>Acute Toxicity</u> Acute Algae Toxicity 72h EC50: >3300 mg/L (Skeletonema costatum) Acute Crustacean Toxicity 48h LC50: 1687 mg/L (Acartia tonsa) CFR-3L is CFR-3 in solution LD50: 8670 mg/kg (Rat) <u>Biodegradation/bioaccumulation:</u> Log Pow: <0 (OECD 117) Biodegradation(28 Days): 5% (Marine BODIS)</p>	0.7169%	Yes
Halad-413L	Halliburton	Reduces filtrate loss across permable formations	<p><u>Acute Toxicity</u> Oral Toxicity LD50: > 5,000 mg/kg (Rat) Dermal Toxicity LD50: > 2,000 mg/kg (Rabbit) <i>Humic acids, sodium salts, polymers with N,N-dimethyl-2-propenamide, sodium 2-methyl-2-[(1-oxo-2-propen-1-yl) amino]-1-propanesulfonate (1:1) and 2-propenenitrile, sodium bisulfite-terminated as an ingredient (10-30%)</i> Algae Toxicity EC50 (72h): 1,102 mg/L (Skeletonema costatum) Crustacean Toxicity LC50 (48h): >2,000 mg/L (Acartia tonsa) Fish Toxicity LC50 (96h): >1,000 mg/L (Scophthalmus maximus) (juvenile turbot) Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Slowly biodegradable. <i>Humic acids, sodium salts, polymers with N,N-dimethyl-2-propenamide, sodium 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-</i></p>	5.3919%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p><i>1-propanesulfonate (1:1) and 2-propenenitrile, sodium bisulfite-terminated As an ingredient (10-30%)</i> Log Pow: <0 (OECD 117) Biodegradation (28 Days): 6.1% (OECD 306)</p>		
SCR-100L	Halliburton	Delays cement hydration reaction, high temperature	<p><u>Acute Toxicity:</u> <i>Acrylic acid polymer with Sodium AMPS, sodium salt as an ingredient (60-100%):</i> Algae EC50(72h): >3300mg/L (Skeletonema costatum) Crustacean LC50(48h): >2000mg/L (Acartia tonsa) Fish LC50(96h): >1000mg/L (Scophthalmus maximus juvenile)</p> <p><i>2-Bromo-2- (bromomethyl) pentanedinitrile as an ingredient (<0.1%) LD50 Rat (male) oral 0.77 g/kg.</i></p> <p><i>FD&C Blue 1 as an ingredient (0.1%)</i> Rat LD50 (oral) >5000 mg/kg.</p> <p>Water makes up the remainder of the product at percentages less than 100%.</p> <p><u>Biodegradation/bioaccumulation:</u> <i>Acrylic acid polymer with Sodium AMPS, sodium salt (60-100%) as an ingredient:</i> Biodegradation (28 days): 39% (OECD306);</p>	1.1846%	Yes
NF-6	Halliburton	Reduces air entrapment into cement slurry	<p><u>Acute Toxicity:</u> Not determined for Fish, Crustaceans and Algae as a complete mix. Rape oil as an ingredient (60-100%) Oral Toxicity LD50: >5,000 mg/kg (Rat) Dermal Toxicity LD50: >5,000 mg/kg (Rabbit) Fish Toxicity LC50: >5,600 mg/L</p>	0.1135%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p>Algae Toxicity EC50: >3,200 mg/L <i>Monopropylene glycol monooleate as an ingredient (5-10%)</i> Fish Toxicity LC50: 3,200 mg/L Algae Toxicity EC50: 990 mg/L <i>Sorbitan, monopalmitate as an ingredient (1-5%)</i> Fish Toxicity LC50: >,1800 mg/L Algae Toxicity EC50: 41 mg/L <i>Aluminium stearate as an ingredient (1-5%)</i> Fish Toxicity LC50: >5,600 mg/L EC50: 6,500 mg/L Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Readily biodegradable. Low bioaccumulation potential due to rapid degradation.</p>		
Silicalite Liquid	Halliburton	Light weight cement additive	<p><u>Acute Toxicity:</u> CONSTITUENT 1 (≤60%): Acute Algae Toxicity 72h EC50: 440 mg/L (<i>Selenastrum capricornutum</i>); Acute Crustacean Toxicity 48h EC50: 7600 mg/L (<i>Ceriodaphnia dubia</i>); Acute Fish Toxicity 96h LC50 5000 mg/L (<i>Brachydanio rerio</i>); CONSTITUENT 2 (≤60%): No Hazard CONSTITUENT 3 (≤1%): LC50(96h): > 1000 mg/L (<i>Brachydanio rerio</i>) LC50(24h): >1000 mg/L (<i>Daphnia magna</i>) LC50(10d): 50566 mg/kg (<i>Corophium volutator</i>) <u>Biodegradation/bioaccumulation:</u></p>	14.0926%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			""SiO2" is a stable substance. In the environment it occurs in different modifications and it is one of the most abundant materials on the Earth's surface."" Biodegradability is "not applicable" for silica since it is inorganic. Additionally, "bioaccumulation is not expected." Source: IUCLID 2000		
HR-25L	Halliburton	Cement Retarder	<p><u>Acute Toxicity:</u> Algae: EC50(72h): 791.25 mg/L (Skeletonema costatum) Crustacean: LC50(48h): 3753.85 mg/L (Acartia tonsa) Fish: LC50(96h): 250 mg/L (Scophthalmus maximus juvenile) <u>Biodegradation/bioaccumulation:</u> Log Pow: 0 - 4.7 (OECD 117) Biodegradation(28 Days): 77% (OECD 306)</p>	0.5374%	Yes
Total				100.00%	

C. Chemical List

Chemicals	CAS number	Mass fraction (%)
Water	NA	9.5595%
Portland cement	65997-15-1	36.5355%
Water in Product	7732-18-5	20.1816%
Crystalline silica, quartz	14808-60-7	19.6730%
Silica, amorphous - fumed	7631-86-9	11.0673%
Humic acids, sodium salts, polymers with N,N-dimethyl-2-propenamide, sodium 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-1-propanesulfonate (1:1) and 2-propenenitrile, sodium bisulfite-terminated	473268-27-8	1.4638%
Acrylic acid polymer with sodium AMPS, sodium salt	37350-42-8	0.6432%
Sulfurous acid, monosodium salt, polymer with formaldehyde and acetone	40104-76-5	0.3893%
Tartaric acid	87-69-4	0.2918%
Rape Oil	8002-13-9	0.1027%
Sodium hydroxide	1310-73-2	0.05693%

Chemicals	CAS number	Mass fraction (%)
Sulfurous acid, monosodium salt, polymer with formaldehyde and acetone	40104-76-5	0.01275%
Monopropylene glycol monooleate	1330-80-9	0.01027%
Sorbitan, monopalmitate	26266-57-9	0.005136%
Aluminium stearate	637-12-7	0.005136%
FD&C Blue 1	3844-45-9	0.001072%
2-Bromo-2-(bromomethyl)pentanedinitrile	35691-65-7	0.001072%
Total		100.00%

A. System Details

Operator	AWE Perth Pty Ltd
Project/Well	Waitsia-01 Well
System	AWE Tuned Spacer E+ (Cementing)
Total Volume of System (L)	23,8455

B. Product List

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
Freshwater	On site bore	Base fluid	No hazard this is freshwater.	99.23%	N/A
Econolite liquid	Halliburton	Additive	<p>CONSTITUENT 1 (≤60%): Crustacean Toxicity 100h EC50: 247 mg/L (Daphnia magna); Acute Fish Toxicity 96h LC50: 301-478 mg/L (Lepomis macrochirus); Component is an inorganic substance with "No bioaccumulation potential"; "studies on biodegradation are not applicable." Source: IUCLID 2000 PLONOR Bioassay testing where LC50/ EC50: >100mg/L Readily biodegradable LD50:2000-3000 mg/kg (Rat)</p> <p>CONSTITUENT 2 (≤100%): No Hazard (Water)</p>	0.4427%	Yes
NF-6	Halliburton	Reduces air entrapment into cement slurrer	<p><u>Acute Toxicity:</u> Not determined for Fish, Crustaceans and Algae as a complete mix. Rape oil as an ingredient (60-100%) Oral Toxicity LD50: >5,000 mg/kg (Rat) Dermal Toxicity LD50: >5,000 mg/kg (Rabbit) Fish Toxicity LC50: >5,600 mg/L</p>	0.0006973%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p>Algae Toxicity EC50: >3,200 mg/L <i>Monopropylene glycol monooleate as an ingredient (5-10%)</i> Fish Toxicity LC50: 3,200 mg/L Algae Toxicity EC50: 990 mg/L <i>Sorbitan, monopalmitate as an ingredient (1-5%)</i> Fish Toxicity LC50: >,1800 mg/L Algae Toxicity EC50: 41 mg/L <i>Aluminium stearate as an ingredient (1-5%)</i> Fish Toxicity LC50: >5,600 mg/L EC50: 6,500 mg/L Water makes up the remainder of this product. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Readily biodegradable. Low bioaccumulation potential due to rapid degradation.</p>		
Barite	Halliburton	Weighting Agent	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: >15,000 mg/kg (Rat) Fish Toxicity TLM96: 7,500 ppm (Oncorhynchus mykiss) <u>Chronic Toxicity:</u> Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. Individuals with silicosis are predisposed to develop tuberculosis. <u>Biodegradation/bioaccumulation:</u> Barium sulphate (major ingredient of barite ~60-100%) is insoluble in water and not biodegradable.</p>	0.2901%	Yes
Tuned Spacer E+	Halliburton	Variable rheology	<p><u>Acute Toxicity:</u> <i>Bentonite as an ingredient (60-100%)</i></p>	0.03608%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
		spacer polymer	<p>Oral Toxicity LD50: 5,000 mg/kg (Rat) Fish Toxicity (Marine) 96h LC50: 8-19 g/L (Salmo gairdneri) Fish Toxicity TLM96: 10,000 ppm (Oncorhynchus mykiss) <i>Crystalline silica, quartz as an ingredient (1-5%)</i> Oral Toxicity LD50: 500 mg/kg (Rat) Fish Toxicity LC50: >10,000 mg/l Algae Toxicity EC50: >5,000 mg/l <i>Crystalline silica, cristobalite as an ingredient (0-1%)</i> As for Crystalline silica, quartz. <i>Crystalline silica, tridymite as an ingredient (0-1%)</i> As for Crystalline silica, quartz. <i>Sodium Lignosulfonate as an ingredient (10-30%)</i> Oral Toxicity LD50 Rat: >6,000 mg/kg <i>Welan gum as an ingredient (5-10%)</i> Fish Toxicity LC50: >750 mg/l Algae Toxicity EC50: 1240 mg/l <u>Chronic Toxicity:</u> Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes- fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. Individuals with silicosis are predisposed to develop tuberculosis. Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). <u>Biodegradation/bioaccumulation:</u></p>		

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			Silica is a naturally occurring, insoluble component of soil. Biodegradation is "not applicable" for crystalline silica since it is inorganic. Concentration-based toxicity values were not available.		

C. Chemical List

Chemicals	CAS number	Mass fraction (%)
Water	NA	99.23%
Water in Product	7732-18-5	0.3240%
Barite	13462-86-7	0.2123%
Sodium silicate	1344-09-8	0.1944%
Bentonite	1302-78-9	0.02640%
Sodium Lignosulfonate	8061-51-6	0.007921%
Welan gum	72121-88-1	0.002640%
Crystalline silica, quartz	14808-60-7	0.0007921%
Rape Oil	8002-13-9	0.0005103%
Crystalline silica, tridymite	15468-32-3	0.0002640%
Crystalline silica, cristobalite	14464-46-1	0.0002640%
Monopropylene glycol monooleate	1330-80-9	0.00005103%
Sorbitan, monopalmitate	26266-57-9	0.00002551%
Aluminium stearate	637-12-7	0.00002551%
Total		100.00%

A. System Details

Operator	AWE Perth Pty Ltd
Project/Well	Waitsia-01 well
System	Drilling
Total Volume of System (L)	199,1634*

(*30% Contingency)

B. Product List

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
Freshwater	On site bore	Base fluid	No hazard	64.00%	N/A
Rheoben (Bentonite)	Newpark	Viscosifier	<u>Acute Toxicity:</u> Fish Toxicity 96h LC50: 8-19 g/L (<i>Salmo gairdneri</i>) <u>Chronic Toxicity:</u> Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. Individuals with silicosis are predisposed to develop tuberculosis. <u>Biodegradation/bioaccumulation:</u> The product is insoluble in water and can be removed by filtration and so is not expected to present a hazard.	6.21%	Yes
Potassium Chloride	Newpark	Shale swelling inhibition (smectite & illite clays)	<u>Acute Toxicity</u> Oral Toxicity LD50: > 5,000 mg/kg (Rat) Crustaceans Toxicity TLM96: 100-330 ppm (Crangon crangon) Fish Toxicity LC50 (24 hr): 950 mg/l, LC50 (48 hr): 910 mg/l, LC50 (96 hr): 880 mg/l (Pimephales Promelas) <u>Chronic Toxicity:</u>	2.61%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p>No data available to indicate product or components present at greater than 1% are chronic health hazards. Aquatic Invertebrates EC50 (21d): 130 mg/l, LOEC (21d): 101 mg/l (16 % reproduction impairment)(Daphnia magna) <u>Biodegradation/bioaccumulation:</u> In water, potassium chloride is highly water soluble, and readily undergoes dissociation. Potassium chloride as an inorganic salt is not subjected to further biodegradation processes.</p>		
Salt/Sodium Chloride	Newpark	Weighting Agent	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: 3000 mg/kg (Rat) Oral Toxicity LD50: 4,000 mg/kg (Mouse) Dermal Toxicity LD50: >10,000 mg/kg (Rabbit) <u>Chronic Toxicity:</u> Not listed as a carcinogen. No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u> Low bioaccumulation in water/soil. High mobility.</p>	19.13%	Yes
Barite/Rheobar	Newpark	Weighting Agent	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: >15,000 mg/kg (Rat) Fish Toxicity TLM96: 7,500 ppm (Oncorhynchus mykiss) <u>Chronic Toxicity:</u> Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. Individuals with silicosis are predisposed to develop tuberculosis. <u>Biodegradation/bioaccumulation:</u></p>	1.41%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			Barium sulphate (major ingredient of barite ~60-100%) is insoluble in water and not biodegradable.		
Limestone LSC	Newpark	Bridging and Weighting Agent	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: 7,340 mg/kg (Rat) Fish Toxicity TLM96: 100-500 ppm (<i>Oncorhynchus mykiss</i>) Crustaceans Toxicity TLM96: 478,520 ppm (<i>Mysidopsis bahia</i>) SPP @ 8 ppb.</p> <p><u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards.</p> <p><u>Biodegradation/bioaccumulation:</u> Sparingly soluble in water as hydroxide to form alkaline solution. Low mobility in most ground conditions. Not expected to bioaccumulate.</p>	1.30%	Yes
Rheopac LV /	Newpark	Fluid Loss	<p><u>Acute Toxicity:</u> Aquatic toxicity: LC50 (Fresh Water Trout) > 21,000 ppm/96hrs. LC50 (Salt Water Stickel Back) > 56,000 ppm/96hrs.</p> <p><u>Biodegradation/bioaccumulation:</u> This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.</p>	0.37%	Yes
Xanthan Gum (P)	Newpark	Viscosifier	<p><u>Acute Toxicity:</u> LD50 (Oral): >1000 mg/kg (mouse) LD50 (Intraperitoneal): >50 mg/kg (mouse) LD50 (Intravenous): 100-250 mg/kg (mouse) LD50 (Oral): >45,000 mg/kg (rat) LD50 (Oral): >20,000 mg/kg (dog).</p> <p><u>Biodegradation/bioaccumulation:</u> This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.</p>	0.46%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
JK-161LV	Newpark	Encapsulating Agent - provides shale inhibition	<p><u>Acute Toxicity:</u> Mysidopsis bahia = 48hr LC50 = 16.2 mg/L. Menidia beryllina = 48hr LC50 = 34.2 mg/L. Scophthalmus Maximus = 96hr LC50 > 1000 mg/L. Skeletonemia costatum = 72hr EC50 = 393 mg/L [NOEC = 118 mg/L]. Acartia tonsa = 48 hr EC50 = 393 mg/L [NOEC = 112 mg/L] Corophium Volutator = 10 Day LC50 = 9338 mg/Kg [NOEC = 1000 mg/Kg]. (10000 ppm test concentration) (EPA-821-R-02-012)</p> <p><u>Biodegradation/bioaccumulation:</u> For the most part, polyacrylamide is resistant to microbial attack, and its degradation is mainly through physical breakdown. Polyacrylamide has been shown to be non-toxic to humans, animals, fish, and plants; the only concern has been the toxicity of its residual monomer (acrylamide) content, which is a known neurotoxin to humans. Polyacrylamide can also degrade to acrylamide under environmental conditions The monomer is bio-degradable and does not accumulate in soils.</p>	0.24%	Yes
Caustic Soda	Newpark	pH control- prevents bacteria & corrosion.	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: 140-340 mg/kg (Rat) Dermal Toxicity LD50: 1350 mg/kg (Rabbit) Fish Toxicity TLM96: 730 ppm (Oncorhynchus mykiss)</p> <p><u>Chronic Toxicity:</u> Prolonged, excessive exposure may cause erosion of the teeth. The presence of NaOH had an adverse effect on the survival rate, growth and fecundity, as well as the quality of the progeny of the guppy. Upon prolonged exposure</p>	0.06%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p>concentrations of 25 to 100 mg/l produced significant changes in the biology of guppy.</p> <p><u>Biodegradation/bioaccumulation:</u> Environmental processes (such as oxidation and the presence of acids or bases) may transform insoluble metals to more soluble ionic forms. Will degrade to stable salts if released to formation.</p> <p><u>Water:</u> If released to waterways, alkaline products may change the pH of the waterway. Fish will die if the pH reaches 10-11 (goldfish 10.9, bluegill 10.5). SOIL: May leach to groundwater with toxic effects on aquatic life as above.</p> <p><u>Atmosphere:</u> Not expected to reside in the atmosphere. Drops or particles released to atmosphere should be removed by gravity and/or be rained out.</p>		
Sodium Sulphite	Newpark	Oxygen Scavenger	<p><u>Acute Toxicity:</u> LD50 (ingestion) 820 mg/kg (mouse) LD50 (intraperitoneal) 950 mg/kg (mouse) LD50 (intravenous) 175 mg/kg (mouse) LDLo (ingestion) 2825 mg/kg (rabbit) LDLo (intravenous) 400 mg/kg (cat) LDLo (subcutaneous) 600 mg/kg (rabbit)</p> <p><u>Biodegradation/bioaccumulation:</u> This product is completely biodegradable. Sodium Sulphite is an oxygen scavenger when introduced to water. Bioaccumulation of this product has not been determined.</p>	0.06%	Yes
Soda Ash	Newpark	pH/Hardness control	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: 4,220 mg/kg (Rat) Fish Toxicity TLM24: 385 mg/l (Lepomis macrochirus)</p> <p><u>Chronic Toxicity:</u></p>	0.06%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p>Substance is not classified as carcinogenic under ACGIH, IARC, NTP or OSHA.</p> <p><u>Biodegradation/bioaccumulation:</u> Biodegradability does not pertain to inorganic substances. Does not bioaccumulate. Dissociates into ions.</p> <p><u>Water:</u> If released to waterways, alkaline products may change the pH of the waterway. Fish will die if the pH reaches 10-11 (goldfish 10.9, bluegill 10.5).</p> <p><u>Soil:</u> May leach to groundwater with toxic effects on aquatic life as above.</p> <p><u>Atmosphere:</u> Not expected to reside in the atmosphere. Drops or particles released to atmosphere should be removed by gravity and/or be rained out. Biodegradation: Not applicable given inorganic.</p>		
Sodium Bicarbonate	Newpark	pH Buffer, Contamination Treatment	<p><u>Acute Toxicity:</u> This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities.</p> <p>Draize test, rabbit, eye: 100 mg/30S Mild; Oral, mouse: LD50 = 3360 mg/kg; Oral, rat: LD50 = 4220 mg/kg;<br.</p> <p><u>Biodegradation/bioaccumulation:</u> Not expected to bioaccumulate.</p>	0.04%	Yes
Citric Acid	Newpark	pH Buffer,	<p><u>Acute Toxicity:</u> Oral Toxicity LD50: 3,000 mg/kg (Rat) Fish Toxicity 96h LC50: >440-760 mg/L (Leuciscus idus) Crustacean Toxicity 72h EC50: 120 mg/L (Daphnia magna) Algae Toxicity 7d EC3: 640 mg/L (Scenedesmus quadricauda)</p> <p><u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards.</p>	0.04%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<u>Biodegradation/bioaccumulation:</u> BOD30/COD = 90%. Rapidly biodegradable in water and soil.		
Idcide-20	Newpark	Biocide/Prevents bacterial contamination of the mud	<u>Acute Toxicity:</u> 75% Tetrakis (hydroxymethyl) Phosphonium Sulphate (55566-30-8): LC50 (Rainbow Trout) = 119 mg/L/96 hr LC50(Bluegill Sunfish) = 93 mg/L/ 96 hr EC50 (Daphnia Magna) = 19 mg/L/48 hr LC50 (Brown Shrimp) = 340 mg/L/96 hr LC50 (Mysid Shrimp) = 9.5 mg/L/96 hr LC50 (Sheepshead Minnow) = 94 mg/L/96 hr LC50 (Jevenile Plaice) = 86 mg/L/96 hr Waste Water management EC50 (Activated Sludge) = 24mg/L/3 hr. <u>Biodegradation/bioaccumulation:</u> No specific studies undertaken to date.	0.02%	Yes
Gagetrol (HT Logging Pill)	New Park	High temperature fluid loss control agent, highly crosslinked substituted starch	<u>Acute Toxicity : Carboxymethyl Starch 100%</u> Oral, mouse: LD50 = >27 gm/kg; Oral, rabbit: LD50 = >27 gm/kg; Oral, rat: LD50 = 27000 mg/kg; Skin, rabbit: LD50 = >2 gm/kg; <u>Biodegradation/bioaccumulation:</u> No information provided. Not expected to bioaccumulate.	1.22%	Yes
Triethanolamine/ TEA (HT Logging Pill)	New Park	Polymer stabiliser which effectively reduces the degradation of polymers at high temperatures	<u>Acute Toxicity:</u> In soil, residual triethanolamine may leach to groundwater. LC50 (shrimp): > 100 ppm. Triethanolamine: ORAL (LD50): Acute: 2200 mg/kg [Guinea pig]. 5846 mg/kg [Mouse]. 2200 mg/kg [Rabbit].	0.24%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<p><u>Biodegradation/bioaccumulation:</u> Environment In soil and water, triethanolamine will biodegrade fairly rapidly following acclimation (half-life in the order of days to weeks). The substance is expected to be readily biodegradable according to the AS 4351 Part 2 test method.</p>		
Defoam-AP 400	Newpark	Defaomer suitable for High Temperatures	<p><u>Acute Toxicity:</u> Polyethylene glycol (25322-68-3): LD50 (ingestion) 33750 mg/kg (rat) Octan-2-OL; Oral, mouse: LD50 = 300 mg/kg; Oral, rabbit: LD50 = 9300 mg/kg; Oral, rat: LD50 = 200 mg/kg; <u>Biodegradation/bioaccumulation:</u> ATMOSPHERE: Vapour phase glycols are expected to degrade fairly rapidly by reaction with hydroxyl radicals (eg half-life 32 hours for propylene glycol). Removal from air by rainfall is possible. WATER: Should degrade relatively rapidly via biodegradation. SOIL: If released to soil, relatively rapid biodegradation should also occur. Leaching to groundwater may occur.</p>	0.01%	Yes
Fracseal Fine	Newpark	Prevent lost circulation	<p><u>Acute Toxicity:</u> Cellulose (9004-34-6) LC50 (inhalation) > 5800 mg/m³/4 hours (rat) LD50 (ingestion) > 5000 mg/kg (rat) LD50 (intraperitoneal) > 31600 mg/kg (rat) LD50 (skin) > 2000 mg/kg (rabbit)</p>	2.03%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			<u>Biodegradation/bioaccumulation:</u> Main ingredient is Cellulose, an organic material which is readily biodegradable.		
Magnesium Oxide	Newpark	Temperature stabiliser	<u>Acute Toxicity:</u> Toxicity Data SILICA, AMORPHOUS (7631-86-9) LD50 (Ingestion): 3160 mg/kg (rat). Health Hazard Summary Low toxicity - irritant. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in irritation. Eye Irritant. Contact may result in irritation, lacrimation, pain and redness. Inhalation Irritant. Over exposure may result in irritation of the nose and throat, with coughing. Skin Irritant. Contact may result in irritation, redness, rash and dermatitis. Ingestion Low toxicity. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea. <u>Biodegradation/bioaccumulation:</u> Not expected to Biodegrade as it is inorganic ore.	0.48%	Yes
Contingency volumes					
Limestone	Newpark	Bridging & Weighting Agent	<u>Acute Toxicity:</u> Oral Toxicity LD50: 7,340 mg/kg (Rat) Fish Toxicity TLM96: 100-500 ppm (<i>Oncorhynchus mykiss</i>) Crustaceans Toxicity TLM96: 478,520 ppm (<i>Mysidopsis bahia</i>) SPP @ 8 ppb. <u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. <u>Biodegradation/bioaccumulation:</u>	3.40%	Yes

Product Name	Supplier	Purpose	Eco toxicity data	% Product in system fluid	MSDS Attached
			Sparingly soluble in water as hydroxide to form alkaline solution. Low mobility in most ground conditions. Not expected to bioaccumulate.		
Fracseal	Newpark	Prevent lost circulation	As above	8.51%	Yes

MEG	Newpark	Agent to free differentially stuck pipe	<p><u>Acute Toxicity:</u> Ecotoxicity LC50 (Aquatic species) : >100mg/L/96hrs. Non-hazardous to aquatic organisms. Ethylene glycol will mainly exist in the vapour phase in the ambient atmosphere where it will be degraded by reaction with hydroxyl radicals. Expected to be very highly mobile in soil. Not anticipated to volatilise from moist soil or water surfaces.</p> <p><u>Biodegradation/bioaccumulation:</u> Biodegradation in both soil and water is expected to be a major fate process for this compound. Not expected to bio concentrate in aquatic organisms.</p>	8.51%	Yes
Strata-Vanguard	Newpark	Bridging Agent	<p><u>Acute Toxicity:</u> This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities.</p> <p><i>Cristobalite (14464-46-1) as an ingredient (<5%)</i> TCLo (inhalation) 16 mppcf/8hours/17.9 years (human-fibrosis).</p> <p><i>Quartz (Silica Crystalline) (14808-60-7) as an ingredient (<2%)</i> LCLo (inhalation) 300 ug/m³/10 years (human) TCLo (inhalation) 16 000 000 particles/ft³/8 hours/17.9 years (human-fibrosis).</p> <p><i>2-Propenenitrile-1,3- Butadiene Rubber as an ingredient (<50%)</i> LC50 (96 h): >100 mg/L (Oncorhynchus mykiss) LC50 (48 h): >100 mg/L (Daphnia Magna) LC50 (48 h): >100 mg/L (Scenedesmus quadricauda)</p>	8.51%	Yes

			<p><i>Natural Rubber as an ingredient is a natural product (<50%)</i> It is not anticipated to cause adverse environmental effects.</p> <p><i>Polyisoprene as an ingredient (<50%)</i> General-purpose rubber used to replace natural rubber Acute Oral LD50 : >2000mg/kg (Rat, LIR-30) Acute Dermal Irritation (Rabbit) : Negative (LIR-30) Acute Inhalation LC50 : Not Available</p> <p><i>SBR Elastomers as an ingredient (<50%)</i> LD50 (Oral) >5000 mg/kg (rat) LD50 (skin) >20000 mg/kg (rat) LD50 (inhalation) >20000 mg/kg (rat)</p> <p><i>Cellulose (9004-34-6) as an ingredient is a natural product (<30%)</i> LC50 (inhalation) > 5800 mg/m³/4 hours (rat) LD50 (ingestion) > 5000 mg/kg (rat) LD50 (intraperitoneal) > 31600 mg/kg (rat) LD50 (skin) > 2000 mg/kg (rabbit).</p> <p><i>Diatomaceous earth, Flux calcined as an ingredient (<15%)</i> LCLo (inhalation) 300 ug/m³/10 years (human) TCLo (inhalation) 16 000 000 particles/ft³/8 hours/17.9 years (human-fibrosis).</p> <p><i>Fullers earth (Bentonite) as an ingredient (<10%)</i> Fish Toxicity 96h LC50: 8-19 g/L (<i>Salmo gairdneri</i>).</p> <p><i>Limestone as an ingredient (<10%)</i> Calcium carbonate occurs naturally in a wide variety of substances including limestone, marble and egg shells. It is not anticipated to cause adverse environmental effects.</p>		
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			<p><i>Polyethylene (9002-88-4) as an ingredient (<5%)</i> LDLo (ingestion) 3000 mg/kg (rat) <i>Magnesium Oxide (1309-48-4) as an ingredient (<1%)</i> TCLo (inhalation) 400 mg/kg (human)</p> <p><u>Biodegradation/bioaccumulation:</u> This product is not expected to bioaccumulate. This product has low mobility in soil.</p>		
Barite/Rheobar	Newpark	As above	As above	14.47%	Yes
Frac Attack	Newpark	Prevent lost circulation	<p><u>Acute Toxicity:</u></p> <p><i>Calcium Oxide (1305-78-8) as an ingredient (<10%)</i> LD50 3059 mg/kg (Mouse/Intraperitoneal)</p> <p><i>Calcium Hydroxide (1305-62-0) as an ingredient (<5%)</i> LD50 (ingestion) 7300 mg/kg (mouse)</p> <p><i>Cristobalite (14464-46-1) as an ingredient (<5%)</i> TCLo (inhalation) 16 mppcf/8hours/17.9 years (human-fibrosis)</p> <p><i>Quartz (Silica Crystalline) (14808-60-7) as an ingredient (<3%)</i> LCLo (inhalation) 300 ug/m³/10 years (human) TCLo (inhalation) 16 000 000 particles/ft³/8 hours/17.9 years (human-fibrosis)</p> <p><i>2-Propenenitrile-1,3- Butadiene Rubber as an ingredient (<50%)</i> LC50 (96 h): >100 mg/L (Oncorhynchus mykiss) LC50 (48 h): >100 mg/L (Daphnia Magna) LC50 (48 h): >100 mg/L (Scenedesmus quadricauda)</p>	9.72%	Yes

			<p><i>Natural Rubber as an ingredient is a natural product (<50%)</i> It is not anticipated to cause adverse environmental effects.</p> <p><i>Polyisoprene as an ingredient (<50%)</i> General-purpose rubber used to replace natural rubber Acute Oral LD50 : >2000mg/kg (Rat, LIR-30) Acute Dermal Irritation (Rabbit) : Negative (LIR-30) Acute Inhalation LC50 : Not Available <i>SBR Elastomers as an ingredient (<50%)</i> LD50 (Oral) >5000 mg/kg (rat) LD50 (skin) >20000 mg/kg (rat) LD50 (inhalation) >20000 mg/kg (rat)</p> <p><i>SBR Elastomers as an ingredient (<50%)</i> LD50 (Oral) >5000 mg/kg (rat) LD50 (skin) >20000 mg/kg (rat) LD50 (inhalation) >20000 mg/kg (rat)</p> <p><i>Cellulose (9004-34-6) as an ingredient is a natural product (<30%)</i> LC50 (inhalation) > 5800 mg/m³/4 hours (rat) LD50 (ingestion) > 5000 mg/kg (rat) LD50 (intraperitoneal) > 31600 mg/kg (rat) LD50 (skin) > 2000 mg/kg (rabbit).</p> <p><i>Diatomaceous earth, Flux calcined as an ingredient (<15%)</i> LCLo (inhalation) 300 ug/m³/10 years (human) TCLo (inhalation) 16 000 000 particles/ft³/8 hours/17.9 years (human-fibrosis).</p> <p><i>Fullers earth (Bentonite) as an ingredient (<10%)</i> Fish Toxicity 96h LC50: 8-19 g/L (<i>Salmo gairdneri</i>).</p>		
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			<p><i>Magnesium Oxide (1309-48-4) as an ingredient (<2%)</i> TLo (inhalation) 400 mg/kg (human).</p> <p><u>Biodegradation/bioaccumulation:</u> This product is not expected to bioaccumulate.</p>		
Citric Acid	Newpark	As above	As above	0.85%	Yes
Potassium Chloride	Newpark	As above	As above	4.26%	Yes
Glychem MC	Newpark	An inhibitor to prevent shales containing medium to high smectite interlayered clay content dispersing into the mud system	<p><u>Acute Toxicity:</u> Low toxicity to aquatic organisms. LC50 (96 h) : 1800 mg/l (SCOPHTHALMUS MAXIMUS) EC50 (48 h) : 310 mg/l (ACARTIA TONSA) EC50 (72 h) : 391 mg/l (SKELETONEMA COSTATUM)</p> <p><u>Biodegradation/bioaccumulation:</u> Biodegradation BOD5 : N.D. % ThOD Water : Readily biodegradable in water (Test: 69%, 28d, OECD 301D) Soil : T ½: N.D. days Bioaccumulative potential: log Pow : 0.436 (OECD 107); BCF : N.D. (Slightly or not bioaccumulative) Mobility: The product is in volatile and water soluble and will partition to the aqueous phase. The product will dissolve rapidly in water. If released to soil it will evaporate at a low rate. ATMOSPHERE: Vapour phase glycols are expected to degrade fairly rapidly by reaction with hydroxyl radicals (eg half-life 32 hours for propylene glycol). Removal from air by rainfall is possible. WATER: Should degrade relatively rapidly via biodegradation. SOIL: If released to soil, relatively rapid biodegradation should also occur. Leaching to groundwater may occur.</p>	2.55%	Yes
Avaperm NF	Newpark	Prevent swelling clays by blocking	<p><u>Acute Toxicity:</u> LD50 (rat, oral) = >500 >1000 mg/kg* *Based on components</p>	2.55%	Yes

		the site for water hydration.	<p>Skeletonema costatum (Algae tox test) EC50, 54,4mg/l Acartia tonsa (Crustacea tox test) LC50, mg/l, 52,4mg/l Scophthalmus maximus juvenile (Fish tox test) LC50, >51,0 mg/l</p> <p><u>Biodegradation/bioaccumulation:</u> Biodegradation Seawater test OECD 306, 75%. Bioaccumulation OECD 117, Log Pow ≤ 1,36 (0,44 weighted average)</p>		
SAPP	Newpark	Deflocculate or disperse bentonite muds or fluids with high levels of low gravity solids.	<p><u>Acute Toxicity</u> Oral Toxicity LD50: 5,100 mg/kg (Rat) Fish Toxicity LC50/48h: >1,500 mg/l (Golden orfe)</p> <p><u>Chronic Toxicity:</u> No data available to indicate product or components present at greater than 1% are chronic health hazards. Not ranked as a Chronic Health Hazard under the Sara 311/312 Tier II Hazard Ratings.</p> <p><u>Biodegradation/bioaccumulation:</u> This product is readily biodegradable.</p>	0.85%	Yes
Sandseal	Newpark	Fluid loss reducer	Sand seal is made from vegetable materials therefore ecotoxicity and biodegradation/bioaccumulation is not applicable.	0.86%	Yes
JK-161 LV	Newpark	Encapsulating Agent - provides shale inhibition	<p><u>Acute Toxicity:</u> (10000 ppm test concentration) (EPA-821-R-02-012) Mysidopsis bahia = 48hr LC50 = 16.2 mg/L. Menidia beryllina = 48hr LC50 = 34.2 mg/L. Scophthalmus Maximus = 96hr LC50 > 1000 mg/L. Skeletonemia costatum = 72hr EC50 = 393 mg/L [NOEC = 118mg/L] Acartia tonsa = 48 hr EC50 = 393 mg/L [NOEC = 112 mg/L]</p> <p><u>Biodegradation/bioaccumulation:</u> For the most part, polyacrylamide is resistant to microbial attack, and its degradation is mainly through physical breakdown.</p>	0.16%	Yes

			Polyacrylamide has been shown to be non-toxic to humans, animals, fish, and plants; the only concern has been the toxicity of its residual monomer (acrylamide) content, which is a known neurotoxin to humans. Polyacrylamide can also degrade to acrylamide under environmental conditions The monomer is bio-degradable and does not accumulate in soils.		
Quickseal F/M/C	Newpark	Lost circulation material	This product consists of 100% organic fibres (plant material) and is therefore not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities <u>Acute Toxicity:</u> No LD50 data available for this product. <u>Biodegradation/bioaccumulation:</u> This product is not expected to bioaccumulate.	0.12%	Yes
Defoam-AP 400	Newpark	<u>Defoamer</u>	As above	0.01%	Yes
Driscal D	Newpark	High temperature fluid loss control agent	<u>Acute Toxicity:</u> QUARTZ (SILICA CRYSTALLINE) (14808-60-7) LCLo (Inhalation): 300 ug/m3/10 years (human) LDLo (Intratracheal): 200 mg/kg (rat) LDLo (Intravenous): 20 mg/kg (dog) TCLo (Inhalation): 16 000 000 particles/ft3/8 hours/17.9 years (human-fibrosis) LC50: > 1.800 mg/l Exposure time: 96 h Species: Scophthalmus maximus (Flatfish, Flounder) > 10000 MG/KG Exposure time: 10 Days Species: Corophium spp (Sediment Reworker) EC50: 2.859 mg/l Exposure time: 72 h Species: Skeletonema costatum (Marine Algae)	0.28%	Yes

			<p>This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities Safework Australia Exposure Standard: Biodegradation/bioaccumulation: Biodegradation: 11.79% (28 days) (OECD 301D)</p>		
Polydrill	New Park	High temperature fluid loss control agent	<p><u>Acute Toxicity:</u> LC 50 (96 hr) 4430 mg/L Oncorhynchus mykiss (Rainbow trout) EC50 (72 h) > 1,000 mg/l (growth rate), Phaeodactylum tricornutum (OECD Guideline 201, static). This product is expected to be of low toxicity. Under normal conditions of use, adverse health effects are not anticipated. Skin Not classified as a skin irritant. Contact may result in mild irritation.</p> <p><u>Biodegradation/bioaccumulation:</u> Not "readily biodegradable" when tested according to OECD TG 302 B. Hydrolysis will not occur under environmental conditions.</p>	0.85%	Yes
Geovis	Newpark	High temperature viscosifier	<p><u>Acute Toxicity:</u> LC 50 (96 hr) 4430 mg/L Oncorhynchus mykiss (Rainbow trout) EC50 (72 h) > 1,000 mg/l (growth rate), Phaeodactylum tricornutum (OECD Guideline 201, static) Ecotoxicity: The notified polymer is not toxic to fish (rainbow trout), aquatic invertebrates (daphnia magna) and marine invertebrates (acartia tonsa) under test conditions.</p> <p><u>Biodegradation/bioaccumulation:</u> Not "readily biodegradable" when tested according to OECD TG 302 B. Hydrolysis will not occur under environmental conditions.</p> <p>This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.</p>	0.17%	Yes

Total				166.64%*	
*Shaded products are contingent					

C. Chemical List

Chemicals	CAS number	Mass fraction (%)
Water	7732-18-5	64.01%
Bentonite	1302-78-9	6.09%
Potassium Chloride	7447-40-7	2.61%
Calcium Carbonate	471-34-1	1.29%
Sodium Chloride	7647-14-5	19.14%
Barium Sulphate	7727-43-7	1.37%
Sodium Carboxymethyl Cellulose	9004-32-4	0.36%
Xanthan Gum	11138-66-2	0.46%
Acrylamide, Sodium Acrylate Copolymer	25987-30-8	0.24%
Quartz (Silica Crystalline)	14808-60-7	0.18%
Sodium Hydroxide	1310-73-2	0.06%
Sodium Carbonate	497-19-8	0.06%
Sodium Sulphite	7757-83-7	0.06%
Sodium Bicarbonate	144-55-8	0.04%
Citric Acid, Anhydrous	77-92-9	0.04%
Sodium Glycolate	2836-32-0	0.003%
Tetrakis (Hydroxymethyl) Phosphonium Sulphate	55566-30-8	0.004%
Carboxymethyl Starch	9057-06-1	1.216%
Triethanolamine	102-71-6	0.195%
Diethanolamine	111-42-2	0.024%
Ethanolamine	141-43-5	0.024%
Polyethylene Glycol	25322-68-3	0.005%
Octan-2-ol	123-96-6	0.005%
Calcium Oxide	1305-78-8	0.017%
Magnesium Oxide	1309-48-4	0.448%
Cellulose	9004-32-6	2.030%
Silica, Amorphous	7631-86-9	0.012%
Total		100.00%
Cellulose	9004-34-6	10.15%
Ethylene Glycol	107-21-1	8.51%

Chemicals	CAS number	Mass fraction (%)
Barium Sulphate	7727-43-7	14.03%
Citric Acid	77-92-9	0.85%
Potassium Chloride	7447-40-7	4.26%
2-Propenenitrile, polymer with 1,3-butadiene Rubber	9003-18-3	3.28%
Natural Rubber	6/04/9006	2.92%
Rubber - SBR elastomers (derived from recycled automotive tyres)	9003-55-8	2.73%
Polyisoprene	9003-31-0	0.55%
Diatomaceous Earth	68855-54-9	2.73%
Poly(oxy-1,2-ethanediyl), alpha-butyl-omega-hydro	9004-77-7	2.55%
Fuller's earth	8031-18-3	1.46%
Disodium Pyrophosphate	7758-16-9	0.85%
Calcium Carbonate	471-34-1	4.86%
Cristobalite	14464-46-1	0.46%
Polyethylene	9002-88-4	0.46%
Quartz (Silica Crystalline)	14808-60-7	0.80%
Magnesium Oxide	1309-48-4	0.18%
Calcium Oxide	1305-78-8	0.30%
Hydrochloric acid	7647-01-0	0.24%
Calcium Hydroxide	1305-62-0	0.20%
Magnesium Oxide	1309-48-4	0.19%
Acrylamide, Sodium Acrylate Copolymer	25085-02-3	0.16%
Polyethylene Glycol	25322-68-3	0.01%
Octan-2-ol	123-96-6	0.01%
Vegetable Materials	NC	0.86%
Hexanedinitrile	628-73-9	1.28%
Hydrochloric acid	7647-01-0	0.51%
Organic Fibre	NC	0.12%
2-Acrylamido-2-Methylpropane Sulfonic Acid, Sodium Salt	5165-97-9	0.28%
Formaldehyde, polymer with 2-propanone, bisulfited, monoethers with 3,4,5 - trihydroxybenzoic acid, sodium salt	1101873-72-6	0.85%

Chemicals	CAS number	Mass fraction (%)
"D-glucurono-6-deoxy-l-manno-d-glucan, Acetate, calcium magnesium potassium sodium Salt"	595585-15-2	0.17%
Water	7732-18-5	0.77%
Total		67.58%

Attachment 3
Waitsia-01 MSDSs

Attachment 3a
Drilling Fluids MSDSs

Product Name **QUICKSEAL (F,M,C)****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) QUICKSEAL
Use(s) DRILLING FLUID ADDITIVE
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
ORGANIC FIBRE(S)	Not Available	Not Available	100%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases if strongly heated.

Fire and Explosion Treat as per requirements for Surrounding Fires: Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

Product Name **QUICKSEAL (F,M,C)**

6. ACCIDENTAL RELEASE MEASURES

Spillage If spilt (bulk), use personal protective equipment. Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Also store removed from calcium oxides, bleaching powder, perchlorates, perchloric acid, sodium chlorate, fluorine, nitric acid, sodium nitrate and sodium nitrite.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds ORGANIC FIBRE(S)
ES-TWA: 10 mg/m³ (dust)

Biological Limits No Biological Limit Value allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE Personal Protective Equipment is not required under normal conditions of use. When using large quantities or where heavy contamination is likely, wear: dust-proof goggles, rubber or PVC gloves and coveralls. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	YELLOW TO BROWN SOLID	Solubility (water)	INSOLUBLE
Odour	SLIGHT ODOUR	Specific Gravity	0.9 - 1.2
pH	7 - 8	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT AVAILABLE
Boiling Point	NOT RELEVANT	Upper Explosion Limit	NOT RELEVANT
Melting Point	NOT AVAILABLE	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Compatible with most commonly used materials. Also incompatible with calcium oxides, bleaching powder, perchlorates, perchloric acid, sodium chlorate, fluorine, nitric acid, sodium nitrate and sodium nitrite.

Hazardous Decomposition Products May evolve toxic gases if heated to decomposition.

Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Low toxicity - low irritant. Use safe work practices to avoid eye or skin contact and inhalation.

Eye Low irritant. Contact may result in irritation, lacrimation and redness.

Inhalation Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.

Skin Low irritant. Prolonged or repeated exposure to dust may result in irritation and dermatitis.

Ingestion Low toxicity. Ingestion may result in gastrointestinal irritation, nausea and vomiting. However, due to product form ingestion is considered unlikely.

Toxicity Data No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

Environment This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer if additional information is required.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name None Allocated

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated

Packing Group None Allocated **Hazchem Code** None Allocated

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.

ADG - Australian Dangerous Goods.

BEI - Biological Exposure Indice(s).

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EC No - European Community Number.

HSNO - Hazardous Substances and New Organisms.

IARC - International Agency for Research on Cancer.

mg/m³ - Milligrams per Cubic Metre.

NOS - Not Otherwise Specified.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

RTECS - Registry of Toxic Effects of Chemical Substances.

STEL - Short Term Exposure Limit.

SWA - Safe Work Australia.

TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or

Product Name **QUICKSEAL (F,M,C)**

obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

Product Name **POTASSIUM CHLORIDE (RHEOCHEM)****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) KCL • MURIATE OF POTASH • POTASH • SYLVITE
Use(s) DRILLING FLUID ADDITIVE • FERTILISER • INHIBITOR
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
POTASSIUM CHLORIDE	KCl	7447-40-7	>97%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases (potassium oxides, chlorides) when heated to decomposition.

Fire and Explosion Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage If spilt (bulk), use personal protective equipment. Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from oxidising agents and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds No exposure standard(s) allocated.

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE Personal Protective Equipment is not required under normal conditions of use. At high dust levels, wear: dust-proof goggles and a Class P1 (Particulate) respirator. With prolonged use, wear: rubber or cotton or PVC gloves and coveralls.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE SOLID	Solubility (water)	340 g/L @ 20°C
Odour	ODOURLESS	Specific Gravity	2.0
pH	NOT AVAILABLE	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	1413°C	Upper Explosion Limit	NOT RELEVANT
Melting Point	773°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Incompatible (potentially explosive) with oxidising agents (eg. hypochlorites).

Hazardous Decomposition Products May evolve toxic gases (potassium oxides, chlorides) when heated to decomposition.

Hazardous Reactions Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Low toxicity. Use safe work practices to avoid eye or skin contact and inhalation. Acute potassium poisoning via ingestion is rare as a large single dose usually induces vomiting, and potassium is rapidly excreted by the body, however this product does have the potential to cause cardiovascular disorders.

Eye Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.

Inhalation Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.

Skin Low irritant. Prolonged or repeated contact may result in mild irritation, rash and dermatitis.

Ingestion Low toxicity. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea. Ingestion of large quantities may result in blood clotting changes, cardiac arrhythmias, increased respiration, muscle weakness, convulsions and coma.

Toxicity Data POTASSIUM CHLORIDE (7447-40-7)
LD50 (Ingestion): 1500 mg/kg (mouse)
LD50 (Intraperitoneal): 620 mg/kg (mouse)

Product Name POTASSIUM CHLORIDE (RHEOCHEM)

LD50 (Intravenous): 117 mg/kg (mouse)
LDLo (Ingestion): 20 mg/kg (man)
LDLo (Intraperitoneal): 900 mg/kg (guinea pig)
LDLo (Intravenous): 77 mg/kg (guinea pig)
LDLo (Subcutaneous): 2120 mg/kg (frog)
TDLo (Ingestion): 60 mg/kg/days (woman)

12. ECOLOGICAL INFORMATION

Environment Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Collect and place in sealable containers and dispose of to an approved landfill site. Contact the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.

ADG - Australian Dangerous Goods.

BEI - Biological Exposure Indice(s).

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EC No - European Community Number.

HSNO - Hazardous Substances and New Organisms.

IARC - International Agency for Research on Cancer.

mg/m3 - Milligrams per Cubic Metre.

NOS - Not Otherwise Specified.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

RTECS - Registry of Toxic Effects of Chemical Substances.

STEL - Short Term Exposure Limit.

SWA - Safe Work Australia.

TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is

Product Name **POTASSIUM CHLORIDE (RHEOCHEM)**

made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name POLYDRILL
Synonym(s) POLY DRILL

1.2 Uses and uses advised against

Use(s) ADDITIVE • DRILLING FLUID ADDITIVE

1.3 Details of the supplier of the product

Supplier name NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
SULPHONATED ORGANIC POLYMER	-	-	100%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting. Ingestion is considered unlikely due to product form.

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Adverse effects not expected from this product under normal conditions of use.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains and waterways.

5.2 Special hazards arising from the substance or mixture

Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition. Finely divided dust may form explosive mixtures with air.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled and tightly closed when not in use.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	RED BROWN POWDER
Odour	CHARACTERISTIC ODOUR
Flammability	COMBUSTIBLE
Flash point	NOT RELEVANT
Boiling point	> 370°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	7 to 9 (150 g/L)
Vapour density	NOT AVAILABLE
Specific gravity	1.8
Solubility (water)	320 g/L
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites) and acids (e.g. nitric acid).

10.6 Hazardous decomposition products

May evolve carbon oxides and hydrocarbons when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity This product is expected to be of low toxicity. Under normal conditions of use, adverse health effects are not

PRODUCT NAME POLYDRILL

	anticipated.
Skin	Not classified as a skin irritant. Contact may result in mild irritation.
Eye	Not classified as an eye irritant. Contact may cause discomfort, lacrimation and redness.
Sensitization	This product is not known to be a skin or respiratory sensitiser.
Mutagenicity	No evidence of mutagenic effects.
Carcinogenicity	No evidence of carcinogenic effects.
Reproductive	No evidence of reproductive effects.
STOT – single exposure	No known effects from this product.
STOT – repeated exposure	No known effects from this product.
Aspiration	This product does not present an aspiration hazard.

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No information provided.

12.2 Persistence and degradability

This product is not readily biodegradable.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code None Allocated

15. REGULATORY INFORMATION

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

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Classifications	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals. The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].
Hazard codes	None allocated.
Risk phrases	None allocated.
Safety phrases	None allocated.
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LC50	Lethal Concentration, 50% / Median Lethal Concentration
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	OEL	Occupational Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (highly acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	STEL	Short-Term Exposure Limit
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	SWA	Safe Work Australia
	TLV	Threshold Limit Value
	TWA	Time Weighted Average

Revision history

Revision	Description
2.0	Converted to GHS.
1.0	Initial SDS creation

PRODUCT NAME POLYDRILL

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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Revision: 2

SDS date: 18 November 2014

[End of SDS]

MATERIAL SAFETY DATA SHEET

Product Name **MEG****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) 1,2-DIHYDROXYETHANE • 1,2-ETHANEDIOL • ETHYLENE GLYCOL • MONOETHYLENE GLYCOL
Use(s) ANTIFREEZE • BRAKE FLUID • FOAM • HEAT TRANSFER MEDIUM • HUMECTANT • LEATHER INDUSTRY • PAINT • SOLVENT • TEXTILE CHEMICAL
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R22 Harmful if swallowed.

SAFETY PHRASES

S46 If swallowed, contact a doctor or Poisons Information Centre immediately and show container or label.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated**Packing Group** None Allocated **Hazchem Code** None Allocated**3. COMPOSITION/ INFORMATION ON INGREDIENTS**

Ingredient	Formula	CAS No.	Content
ETHYLENE GLYCOL	C2-H6-O2	107-21-1	100%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use a Type A (Organic vapour) respirator or an Air-line respirator (in poorly ventilated areas). Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

Advice to Doctor Treat symptomatically.

First Aid Facilities Eye wash facilities and safety shower are recommended.

5. FIRE FIGHTING MEASURES

Flammability	Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition. Vapour may form explosive mixtures with air.
Fire and Explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Dry agent, carbon dioxide or foam. Prevent contamination of drains or waterways.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Ventilate area where possible. Contain spillage, then cover / absorb spill with non-combustible absorbant material (vermiculite, sand, or similar), collect and place in suitable containers for disposal. Prevent spill entering drains or waterways.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids, phosphorus pentasulphide, sodium hydroxide, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills. Store as a Class C1 Combustible Liquid (AS1940).
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
Ethylene glycol (vapour)	SWA (AUS)	20 ppm	52 mg/m ³	40 ppm	104 mg/m ³

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE Wear splash-proof goggles, neoprene or butyl or rubber gloves and coveralls. Where an inhalation risk exists, wear: a Type A (Organic vapour) respirator. If spraying, wear: a Type A-Class P1 (Organic gases/vapours and Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	VISCOUS CLEAR COLOURLESS LIQUID	Solubility (water)	SOLUBLE
Odour	ODOURLESS	Specific Gravity	1.12
pH	NOT AVAILABLE	% Volatiles	NOT AVAILABLE
Vapour Pressure	0.05 mm Hg @ 20°C	Flammability	CLASS C1 COMBUSTIBLE
Vapour Density	2.2 (Air =1)	Flash Point	110°C (cc)
Boiling Point	197°C	Upper Explosion Limit	12.8 %
Melting Point	-13°C	Lower Explosion Limit	3.2 %
Evaporation Rate	NOT AVAILABLE		
Autoignition Temperature	314°C		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), alkalis (eg. hydroxides) and phosphorus pentasulphide.
Hazardous Decomposition Products	May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Moderate toxicity. This product has the potential to cause adverse health effects with over exposure. Use safe work practices to avoid eye or skin contact and inhalation. At room temperature ethylene glycol has a low vapour pressure and therefore an inhalation hazard is not anticipated unless heated or sprayed. Chronic exposure may result in kidney and central nervous system (CNS) damage.
Eye	Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low irritant. Over exposure may result in mild respiratory irritation. High level exposure may result in headache, nausea, dizziness and central nervous system (CNS) depression. Due to the low vapour pressure, an inhalation hazard is not anticipated with normal use.
Skin	Irritant. Contact may result in drying and defatting of the skin, rash and dermatitis.
Ingestion	Moderate toxicity. Ingestion may result in nausea, vomiting, abdominal pain, diarrhoea, drowsiness and unconsciousness. Chronic exposure may result in kidney damage. Aspiration may result in chemical pneumonitis and pulmonary oedema.
Toxicity Data	ETHYLENE GLYCOL (107-21-1) LC50 (Inhalation): 10 876 mg/kg (rat) LD50 (Ingestion): 1650 mg/kg (cat) LD50 (Skin): 9530 ug/kg (rabbit) LDLo (Ingestion): 398 mg/kg (human) TCLo (Inhalation): 10,000 mg/m ³ (human - cough) TDLo (Ingestion): 5500 mg/kg (child - anaesthesia)

12. ECOLOGICAL INFORMATION

Environment	Ethylene glycol will mainly exist in the vapour phase in the ambient atmosphere where it will be degraded by reaction with hydroxyl radicals. Expected to be very highly mobile in soil. Not anticipated to volatilise from moist soil or water surfaces. Biodegradation in both soil and water is expected to be a major fate process for this compound. Not expected to bioconcentrate in aquatic organisms.
Ecotoxicity	LC50 (Aquatic species): >100mg/L/96hrs. Non hazardous to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Waste Disposal	Dispose of by controlled incineration, by licensed or competent personnel. Contact the manufacturer for additional information. Prevent contamination of drains and waterways as aquatic life may be threatened and environmental damage may result.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule	Classified as a Schedule 6 (S6) Poison using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information

ETHYLENE GLYCOL: Has been reported to cause teratogenic and mutagenic effects, however the doses recorded for these effects are extremely high. For example experimental rat studies by the oral route have shown that ingestion of 8.5 g/kg by pregnant rats in their 6-15 day of gestation caused teratogenic effects. This equates to the ingestion of 500 ml of ethylene glycol by a 60 kg women for similar effects to occur. Exposure at such levels is not reported in industry.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

STORAGE OF COMBUSTIBLE LIQUIDS. Combustible liquids with a flash point between 61°C and 150°C are required to be stored as for flammable liquids (Dangerous Goods Class 3) under AS 1940. [Refer to Australian Standard 1940, Storage and Handling of Flammable and Combustible Liquids, for full storage guidelines].

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.

ADG - Australian Dangerous Goods.

BEI - Biological Exposure Indice(s).

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EC No - European Community Number.

HSNO - Hazardous Substances and New Organisms.

IARC - International Agency for Research on Cancer.

mg/m³ - Milligrams per Cubic Metre.

NOS - Not Otherwise Specified.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

RTECS - Registry of Toxic Effects of Chemical Substances.

STEL - Short Term Exposure Limit.

SWA - Safe Work Australia.

TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared By

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Product Name **MEG**

SDS Date 01 Nov 2010

End of Report

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **MAGNESIUM OXIDE**
Synonym(s) CALCINED MAGNESIA • MAGNESIA • MAGOXI16 / 27 - PRODUCT CODE

1.2 Uses and uses advised against

Use(s) DRILLING FLUID ADDITIVE • PH INDICATOR

1.3 Details of the supplier of the product

Supplier name **NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD**
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
CALCIUM OXIDE	1305-78-8	215-138-9	<3.5%
MAGNESIUM OXIDE	1309-48-4	215-171-9	>94%
SILICA, AMORPHOUS	7631-86-9	231-545-4	<2.5%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

PRODUCT NAME MAGNESIUM OXIDE

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve magnesium oxides when heated to decomposition.

5.3 Advice for firefighters

Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Ventilate area where possible.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure product is adequately labelled, protected from physical damage and sealed when not in use.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Calcium oxide	SWA (AUS)	--	2	--	--
Fumed silica (respirable dust)	SWA (AUS)	--	2	--	--
Magnesium oxide (fume)	SWA (AUS)	--	10	--	--

PRODUCT NAME MAGNESIUM OXIDE

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE

- Eye / Face** Wear dust-proof goggles.
- Hands** Wear PVC or rubber gloves.
- Body** Not required under normal conditions of use.
- Respiratory** Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	WHITE GRANULES
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	3600°C
Melting point	2800°C
Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Specific gravity	3.6 - 3.7
Solubility (water)	SLIGHTLY SOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

% Volatiles	0 %
--------------------	-----

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible (violently) with interhalogens (e.g. bromine pentafluoride, chlorine trifluoride) and phosphorus pentachloride. May ignite or explode when heated with aluminium powder. Also incompatible with acids (e.g. nitric acid) and dampness as material hydrates.

10.6 Hazardous decomposition products

May evolve magnesium oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	This product is expected to be of low toxicity. Based on available data, the classification criteria are not met.
Skin	Contact may result in irritation, redness, rash and dermatitis.
Eye	Contact may result in irritation, lacrimation, pain and redness.
Sensitization	This product is not classified as causing skin or respiratory sensitisation.
Mutagenicity	This product is not classified as a mutagen.
Carcinogenicity	This product is not classified as a carcinogen.
Reproductive	This product is not classified as a reproductive toxin.
STOT – single exposure	Not classified as causing organ effects from single exposure.
STOT – repeated exposure	Not classified as causing organ effects from repeated exposure.
Aspiration	Not relevant.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	For small amounts, cover with moist sand, vermiculite or similar to avoid dust hazard and dispose of to an approved landfill site. Contact the manufacturer/supplier for additional information if disposing of large quantities (if required).
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

PRODUCT NAME MAGNESIUM OXIDE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code None Allocated

15. REGULATORY INFORMATION

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

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes None allocated.

Risk phrases None allocated.

Safety phrases None allocated.

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information **EXPOSURE STANDARDS - TIME WEIGHTED AVERAGES:** Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: Strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME MAGNESIUM OXIDE

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LC50	Lethal Concentration, 50% / Median Lethal Concentration
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	OEL	Occupational Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	STEL	Short-Term Exposure Limit
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	SWA	Safe Work Australia
	TLV	Threshold Limit Value
	TWA	Time Weighted Average

Revision history

Revision	Description
2.0	Converted to GHS.
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

Risk Management Technologies
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Western Australia 6005
Phone: +61 8 9322 1711
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Email: info@rmt.com.au
Web: www.rmt.com.au.

Revision: 2
SDS date: 29 January 2015

[End of SDS]

MATERIAL SAFETY DATA SHEET

Product Name **JK-161 LV****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) JK - 161 LV • RHEOCHEM JK-161 LV
Use(s) ENCAPSULATING AGENT • HIGH PERFORMANCE WBM
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
ACRYLAMIDE, SODIUM ACRYLATE COPOLYMER	(C3-H5-N-O.C3-H4-O2.Na)x	25085-02-3	>90%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

First Aid Facilities Eye wash facilities and safety shower should be available.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases (carbon/ nitrogen oxides, amines, ammonia, hydrocarbons) when heated to decomposition. May evolve toxic nitrogen oxides and carbon oxides when heated to decomposition.

Fire and Explosion Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds No exposure standard(s) allocated.

Biological Limits No Biological Limit Value allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE Wear dust-proof goggles and PVC or rubber gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE GRANULAR SOLID	Solubility (water)	10 g/L
Odour	ODOURLESS	Specific Gravity	0.8
pH	NOT AVAILABLE	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT RELEVANT
Melting Point	NOT AVAILABLE	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Incompatible with oxidising agents and acids (eg. nitric acid).

Hazardous Decomposition Products May evolve toxic gases (carbon/ nitrogen oxides, amines, ammonia, hydrocarbons) when heated to decomposition. May evolve toxic nitrogen oxides and carbon oxides when heated to decomposition.

Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity. Use safe work practices to avoid eye or skin contact and inhalation. This product may contain trace amounts of residual acrylamide, which is classified as a probable human carcinogen (IARC Group 2A). However, due to the very low levels present, adverse health effects are not anticipated with normal use.
Eye	Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.
Skin	Low irritant. Prolonged or repeated contact may result in mild irritation, rash and dermatitis. Allergic reactions are possible.
Ingestion	Low toxicity. Ingestion is considered unlikely due to product form. However, ingestion via hand-mouth transfer may result in gastrointestinal irritation, nausea and vomiting. Maintain good personal hygiene standards.
Toxicity Data	No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

Environment	(10000 ppm test concentration) (EPA-821-R-02-012) Mysidopsis bahia = 48hr LC50 = 16.2 mg/L. Menidia beryllina = 48hr LC50 = 34.2 mg/L. Scophthalmus Maximus = 96hr LC50 > 1000 mg/L. Skeletonemia costatum = 72hr EC50 = 393 mg/L [NOEC = 118 mg/L] Acartia tonsa = 48 hr EC50 = 393 mg/L [NOEC = 112 mg/L] Corophium Volutator = 10 Day LC50 = 9338 mg/Kg [NOEC = 1000 mg/Kg]
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Dispose of to an approved landfill site. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information	ACRYLIC - ACRYLAMIDE RESINS These resins are generally of low toxicity. Toxicity increases with presence of significant concentrations of acrylic - acrylamide monomers. These monomers have been linked with the development of skin sensitisation.
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RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indice(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m3 - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.

Product Name JK-161 LV

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

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Prepared By

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Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

SAFETY DATA SHEETProduct Name **IDCIDE-20****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) IDCIDE 20
Use(s) BIOCIDES · DRILLING FLUID ADDITIVE · WATER TREATMENT
SDS Date 11 October 2012

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R36/38 Irritating to eyes and skin.
R43 May cause sensitisation by skin contact.

SAFETY PHRASES

S23 Do not breathe gas/fumes/vapour/spray (where applicable).
S24/25 Avoid contact with skin and eyes.
S36 Wear suitable protective clothing.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number	None Allocated	DG Class	None Allocated
Packing Group	None Allocated	Subsidiary Risk(s)	None Allocated
Hazchem Code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE	CAS: 55566-30-8 EC: 259-709-0	Not Available	18 - 25%
WATER	CAS: 7732-18-5 EC: 231-791-2	Not Available	Remainder

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Product Name IDCIDE-20

Advice to Doctor Treat symptomatically.
First Aid Facilities Eye wash facilities should be available.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases if strongly heated. May evolve carbon oxides, sulphur oxides and phosphates when heated to decomposition.

Fire and Explosion Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Use an extinguishing agent suitable for the surrounding fire.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Ventilate area where possible. Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards No exposure standard(s) allocated.

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE

Eye / Face Wear splash-proof goggles.

Hands Wear PVC or rubber gloves.

Body When using large quantities or where heavy contamination is likely, wear coveralls.

Respiratory Where an inhalation risk exists, wear a Type A (Organic vapour) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance COLOURLESS TO PALE YELLOW LIQUID

Odour SLIGHT ODOUR

Flammability NON FLAMMABLE

Flash point NOT RELEVANT

Boiling point > 100°C

Melting point < 0°C

Evaporation rate AS FOR WATER

pH 3.0 to 3.5

Product Name IDCIDE-20

Vapour density	NOT AVAILABLE
Specific gravity	1.08
Solubility (water)	SOLUBLE
Vapour pressure	18 mm Hg @ 20°C
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	> 60 % (Water)

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites) and acids (eg. nitric acid).
Hazardous Decomposition Products	May evolve carbon oxides, sulphur oxides and phosphates when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low to moderate toxicity - irritant. This product has the potential to cause adverse health effects with over exposure. Upon dilution, the potential for adverse health effects may be reduced.
Eye	Severe irritant. Contact may result in irritation, lacrimation, pain, redness and blurring or dimness of vision. Prolonged contact may result in corneal burns and possible permanent damage.
Inhalation	Low irritant. Over exposure to vapours may result in irritation of the nose and throat, with coughing. High level exposure may result in dizziness, nausea and headache. Due to the low vapour pressure, an inhalation hazard is not anticipated with normal use.
Skin	Irritant. Contact may result in irritation, redness, rash and dermatitis. Prolonged or repeated contact may result in burns. May be absorbed through skin with harmful effects. May cause sensitisation by skin contact.
Ingestion	Low to moderate toxicity. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea.
Toxicity Data	TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE (55566-30-8) LD50 (ingestion) 248 mg/kg (rat) TDLo (ingestion) 650 mg/kg/13 weeks - intermittent (rat)

12. ECOLOGICAL INFORMATION

Environment	Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.
Ecotoxicity	75% TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE (55566-30-8): LC50 (Rainbow Trout) = 119 mg/L/96 hr LC50(Bluegill Sunfish) = 93 mg/L/ 96 hr EC50 (Daphnia Magna) = 19 mg/L/48 hr LC50 (Brown Shrimp) = 340 mg/L/96 hr LC50 (Mysid Shrimp) = 9.5 mg/L/96 hr LC50 (Sheepshead Minnow) = 94 mg/L/96 hr LC50 (Jevenile Plaice) = 86 mg/L/96 hr Waste Water management EC50 (Activated Sludge) = 24 mg/L/3 hr
Persistence/Degradability	This product is readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Waste Disposal	For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved landfill site. For larger amounts, contact the manufacturer for additional information. Prevent contamination of drains or waterways as aquatic life may be threatened and environmental damage may result.
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14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	None Allocated	None Allocated	None Allocated
Proper Shipping Name	None Allocated	None Allocated	None Allocated
DG Class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary Risk(s)	None Allocated	None Allocated	None Allocated
Packing Group	None Allocated	None Allocated	None Allocated
Hazchem Code	None Allocated		

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
Inventory Listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional Information	<p>EXPOSURE CONTROL: If utilised in a closed system the potential for over exposure is reduced. If not used in a closed system, local exhaust ventilation is recommended to control exposure. Provide eye wash and safety shower in close proximity to points of potential exposure. Where the potential for an inhalation risk exists, an approved respirator may be required. Do not eat, store, consume food, tobacco or drink in areas where product is used.</p> <p>RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.</p> <p>PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this ChemAlert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.</p> <p>HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.</p>
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Product Name **IDCIDE-20**

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	PEL	Permissible Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	TLV	Threshold Limit Value
	TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision History

Revision	Description
1.3	Standard SDS Review
1.2	Standard SDS Review
1.1	Standard SDS Review
1.0	Initial SDS creation

Report Status

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Prepared By

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Web: www.rmt.com.au

Revision: 1.3
SDS Date: 11 October 2012

End of SDS

SAFETY DATA SHEETProduct Name **GLYCHEM MC/DCP 208****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web site <http://www.rheochem.com.au/>
Synonym(s) DCP 208 • GLYCHEM - MC • GLYCHEM-MC (FORMERLY)
Use(s) DRILLING FLUID ADDITIVE • MUD INHIBITOR • SHALE INHIBITOR
SDS date 14 March 2013

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R36 Irritating to eyes.
R41 Risk of serious damage to eyes.

SAFETY PHRASES

S2 Keep out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S39 Wear eye/face protection.
S46 If swallowed, contact a doctor or Poisons Information Centre immediately and show container or label.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN number	None Allocated	DG class	None Allocated
Packing group	None Allocated	Subsidiary risk(s)	None Allocated
Hazchem code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY	CAS: 9004-77-7 EC: 500-012-0	Xi;R36	100%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability	Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Fire and explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Dry agent, carbon dioxide or water fog. Prevent contamination of drains or waterways.
Hazchem code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear Personal Protective Equipment (PPE) as detailed in Section 8 of this SDS. Clear area of all unprotected personnel. Ventilate area where possible. Contact emergency services where appropriate.
Environmental precautions	Prevent product from entering drains and waterways.
Methods of cleaning up	Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.
References	See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, alkalis, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards	No exposure standard(s) allocated.
Biological limits	No biological limit allocated.
Engineering controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Type A (Organic vapour) respirator. If spraying, wear a Type A-Class P1 (Organic gases/vapours and Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS LIQUID
Odour	MILD ODOUR
Flammability	CLASS C1 COMBUSTIBLE
Flash point	142°C
Boiling point	278°C
Melting point	-35°C

Product Name **GLYCHEM MC/DCP 208**

Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Specific gravity	0.989
Solubility (water)	SOLUBLE
Vapour pressure	0.33 hPa @ 25°C
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Autoignition temperature	202°C
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical stability	Stable under recommended conditions of storage.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to avoid	Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), alkalis (eg. hydroxides), heat and ignition sources.
Hazardous Decomposition Products	May evolve carbon oxides and hydrocarbons when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low to moderate toxicity - irritant. This product has the potential to cause adverse health effects with over exposure. Use safe work practices to avoid eye or skin contact and inhalation. Due to the low vapour pressure of this product, an inhalation hazard is not anticipated unless heated, sprayed or used in poorly ventilated areas. Chronic exposure to some glycols may result in liver and kidney damage.
Eye	Irritant. Contact may result in irritation, lacrimation, pain and redness. May result in burns with prolonged contact.
Inhalation	Irritant. Over exposure may result in nausea, dizziness and potentially severe mucous membrane and respiratory irritation. Due to the low vapour pressure, an inhalation hazard is not anticipated with normal use.
Skin	Irritant. Contact may result in irritation, redness, pain and rash. The manufacturer reports that the LD50 (dermal) for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is 3540 mg/kg (rabbit).
Ingestion	Low to moderate toxicity. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea. The manufacturer reports that the LD50 (oral) for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is 2630 mg/kg (rat).
Toxicity data	No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

Toxicity

Low toxicity to aquatic organisms. The manufacturer reports that the LC50 (fish) for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is > 1800 mg/l/ 96 h(SCOPHTHALMUS MAXIMUS).

The manufacturer reports that the LC50 (invertebrates) for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is 310 mg/l/ 48 h(ACARTIA T O N S A) .

The manufacturer reports that the LC50 for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is 6597 mg/l/ 10 d (COROPHIUM VOLUTATOR).

The manufacturer reports that the E50 for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is > 3200 mg/l/ 48 h (DAPHNIA M A G N A) .

The manufacturer reports that the EC50 for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is 2490 mg/l/ 72 h (SELENASTRUM CAPRICORNUTUM).

The manufacturer reports that the EC10 for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is 188 mg/l/ 72 h (SKELETONEMA COSTATUM).

The manufacturer reports that the EC50 for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is > 391 mg/l/ 72 h (SKELETONEMA COSTATUM).

The manufacturer reports that the EC10 for the ingredient POLY(OXY-1,2-ETHANEDIYL),ALPHA-BUTYL-OMEGA-HYDROXY is > 1995 mg/l/ 30 m (SEWER MICRO ORGANISMS).

Persistence and degradability Biodegradation BOD5 : N.D. % ThOD Water : Readily biodegradable in water (Test: 69%, 28d, OECD 301D) Soil : T ½: N.D. days Bioaccumulative potential: log Pow : 0.436 (OECD 107); BCF : N.D. (Slightly or not bioaccumulative)

Bioaccumulative potential No information provided.

Mobility in soil The product is involatile and water soluble and will partition to the aqueous phase. The product will dissolve rapidly in water. If released to soil it will evaporate at a low rate.

Other adverse effects ATMOSPHERE: Vapour phase glycols are expected to degrade fairly rapidly by reaction with hydroxyl radicals (eg half-life 32 hours for propylene glycol). Removal from air by rainfall is possible. WATER: Should degrade relatively rapidly via biodegradation. SOIL: If released to soil, relatively rapid biodegradation should also occur. Leaching to groundwater may occur.

13. DISPOSAL CONSIDERATIONS

Waste disposal For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved landfill site. For larger amounts, contact the manufacturer for additional information. Prevent contamination of drains or waterways as aquatic life may be threatened and environmental damage may result.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN number	None Allocated	None Allocated	None Allocated
Proper shipping name	None Allocated	None Allocated	None Allocated
DG class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
Packing group	None Allocated	None Allocated	None Allocated
Hazchem code	None Allocated		

15. REGULATORY INFORMATION

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
Inventory Listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGE (TWA) or WES (WORKPLACE EXPOSURE STANDARD) (NZ): Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	PEL	Permissible Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	TLV	Threshold Limit Value
	TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision history

Revision	Description
2.0	Standard SDS Review
1.0	Initial SDS creation

Product Name **GLYCHEM MC/DCP 208**

Report status This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Revision: 2
SDS Date: 14 March 2013

End of SDS

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name GEOVIS
Synonym(s) DIUTAN GUM

1.2 Uses and uses advised against

Use(s) VISCOSITY MODIFIER

1.3 Details of the supplier of the product

Supplier name NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
D-GLUCURONO-6-DEOXY-L-MANNO-D-GLUCAN, ACETATE, CALCIUM MAGNESIUM POTASSIUM SODIUM SALT	595585-15-2	-	>50%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting. Ingestion is considered unlikely due to product form.

First aid facilities No information provided.

4.2 Most important symptoms and effects, both acute and delayed

Adverse effects not expected from this product under normal conditions of use.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains and waterways.

5.2 Special hazards arising from the substance or mixture

Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition. Finely divided dust may form explosive mixtures with air.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled and tightly closed when not in use.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	WHITE TO TAN POWDER
Odour	SLIGHT ODOUR
Flammability	COMBUSTIBLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NON VOLATILE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Specific gravity	NOT AVAILABLE
Solubility (water)	SOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	351°C
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

% Volatiles	0 %
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites) and acids (e.g. nitric acid).

10.6 Hazardous decomposition products

May evolve carbon oxides and hydrocarbons when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	This product is expected to be of low toxicity. Under normal conditions of use, adverse health effects are not anticipated.
Skin	Not classified as a skin irritant. Contact may result in mild irritation. The hydrophilic nature of the notified polymer in powder form can contribute to mechanical irritation and collection in the eyes when dust is generated.
Eye	Not classified as an eye irritant. Contact may cause discomfort, lacrimation and redness. The hydrophilic nature of the notified polymer in powder form can contribute to mechanical irritation and collection on the skin when dust is generated.
Sensitization	This product is not known to be a skin or respiratory sensitiser.
Mutagenicity	No evidence of mutagenic effects.
Carcinogenicity	No evidence of carcinogenic effects.
Reproductive	No evidence of reproductive effects.
STOT – single exposure	No known effects from this product. The hydrophilic nature of the notified polymer in powder form can contribute to mechanical irritation and collection in the airways when dust is generated.
STOT – repeated exposure	No known effects from this product.
Aspiration	This product does not present an aspiration hazard.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

The notified polymer is not toxic to fish (rainbow trout), aquatic invertebrates (daphnia magna) and marine invertebrates (acartia tonsa) under test conditions.

12.2 Persistence and degradability

Considered readily biodegradable.

12.3 Bioaccumulative potential

No experimental results provided. However, based on the molecular weight, water solubility and Kow value the notified polymer is not expected to bioaccumulate.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code None Allocated

15. REGULATORY INFORMATION

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

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Classifications	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals. The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].
Hazard codes	None allocated.
Risk phrases	None allocated.
Safety phrases	None allocated.
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information **RESPIRATORS:** In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME GEOVIS**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
2.0	Converted to GHS.
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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Revision: 2
SDS date: 10 November 2014

[End of SDS]

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name GAGETROL
Synonym(s) RHEOCHEM GAGETROL

1.2 Uses and uses advised against

Use(s) DRILLING AID

1.3 Details of the supplier of the safety data sheet

Supplier name NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD
Address 11 Alacrity Place, Henderson, WA, Australia, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Email Not supplied
Website <http://www.newpark.com>

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

Risk phrases None allocated

Safety phrases None allocated

Refer to section 11: Toxicological Information

Other Hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS number	EC number	Content
CARBOXYMETHYL STARCH	9057-06-1	Not Available	100%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation Due to product form / nature of use, an inhalation hazard is not anticipated.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). Due to product form and application, ingestion is considered unlikely.

First aid facilities No information provided.

4.2 Most important symptoms and effects, both acute and delayed

Adverse effects not expected from this product under normal conditions of use.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

Product name GAGETROL

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains and waterways.

5.2 Special hazards arising from the substance or mixture

Combustible. May evolve carbon oxides and hydrocarbons when heated to decomposition. Dust may form explosive mixtures with air.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering Controls Use engineering controls to eliminate potential dust exposure.

PPE

Eye/Face	When using large quantities or where heavy contamination is likely, wear dust-proof goggles.
Hand	When using large quantities or where heavy contamination is likely, wear PVC or rubber gloves.
Body	No PPE specified.
Respiratory	Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.

Product name GAGETROL

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	OFF-WHITE POWDER
Odour	SLIGHT ODOUR
Odour Threshold	NOT AVAILABLE
pH	9.0 to 10.5 (4 % solution)
Melting Point	NOT AVAILABLE
Boiling Point	NOT AVAILABLE
Flash Point	NOT AVAILABLE
Evaporation Rate	NOT AVAILABLE
Flammability	COMBUSTIBLE
Upper Explosion Limit	NOT AVAILABLE
Lower Explosion Limit	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE
Vapour Density	NOT AVAILABLE
Solubility (water)	SOLUBLE
Partition Coefficient	NOT AVAILABLE
Autoignition Temperature	NOT AVAILABLE
Decomposition Temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive Properties	NOT AVAILABLE
Oxidising Properties	NOT AVAILABLE
Specific Gravity	NOT AVAILABLE

9.2 Other information

No information provided.

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites).

10.6 Hazardous decomposition products

May evolve carbon oxides and hydrocarbons when heated to decomposition.

Product name GAGETROL

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	This product is expected to be of low toxicity. Under normal conditions of use, adverse health effects are not anticipated.
Skin	Not classified as a skin irritant. Contact may result in mild irritation.
Eye	Not classified as an eye irritant. Contact may cause mild irritation and lacrimation.
Sensitization	This product is not known to be a skin or respiratory sensitiser.
Mutagenicity	No evidence of mutagenic effects.
Carcinogenicity	No evidence of carcinogenic effects.
Reproductive	No evidence of reproductive effects.
STOT - single exposure	No known effects from this product.
STOT - repeated exposure	No known effects from this product.
Aspiration	Not relevant.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

Not expected to bioaccumulate.

12.4 Mobility in soil

No information provided.

12.5 Results of PBT and vPvB assessment

No information provided.

12.6 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	No special precautions are required for the disposal of this product.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	Land Transport (ADG)	Sea Transport (IMDG/IMO)	Air Transport (IATA/ICAO)
14.1 UN number	None Allocated	None Allocated	None Allocated
14.2 UN proper shipping name	None Allocated	None Allocated	None Allocated

Product name GAGETROL

14.3 Transport hazard classes

DG Class	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated

14.4 Packing group

None Allocated	None Allocated	None Allocated
----------------	----------------	----------------

14.5 Environmental hazards

None Allocated

14.6 Special precautions for user

Hazchem Code	None Allocated
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15. REGULATORY INFORMATION

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

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications None allocated

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

15.2 Chemical safety assessment

No information provided.

16. OTHER INFORMATION

Additional information HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

COLOUR RATING SYSTEM: RMT has assigned all ChemAlert reports a colour rating of Green, Amber or Red for the sole purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe handling recommendations are provided in all ChemAlert reports so as to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects. As a general guideline, a Green colour rating indicates a low hazard, an Amber colour rating indicates a moderate hazard and a Red colour rating indicates a high hazard.

While all due care has been taken by RMT in the preparation of the Colour Rating System, it is intended as a guide only and RMT does not provide any warranty in relation to the accuracy of the Colour Rating System. As far as is lawfully possible, RMT accepts no liability or responsibility whatsoever for the actions or omissions of any person in reliance on the Colour Rating System.

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
	GHS	Globally Harmonized System
	GTEPG	Group Text Emergency Procedure Guide
	IARC	International Agency for Research on Cancer
	LC50	Lethal Concentration, 50% / Median Lethal Concentration
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	OEL	Occupational Exposure Limit

Product name**GAGETROL**

PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report Status

This ChemAlert report has been independently compiled by RMT's scientific department utilising the original Safety Data Sheet ('SDS') for the product provided to RMT by the manufacturer. The information is based on the latest chemical and toxicological research and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. It is an independent collation by RMT of information obtained from the original SDS for this product. Its content has not been authorised or verified by the manufacturer / distributor of the chemical to which it relates.

This ChemAlert report does not constitute the manufacturer's original SDS and is not intended to be a replacement for same. It is provided to subscribers of ChemAlert as a reference tool only, is not all-inclusive and does not represent any guarantee as to the properties of the product. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this ChemAlert report, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this ChemAlert report.

Prepared By

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Last Reviewed: 01 Aug 2014

Date Printed: 19 Mar 2015

Based on SDS dated: 01 Aug 2014

End of Report

SAFETY DATA SHEET**Product Name** FRASCSEAL FINE, MEDIUM**1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) FINE FRACSEAL
Use(s) DRILLING FLUID ADDITIVE
SDS Date 23 November 2012

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

None allocated

SAFETY PHRASES

None allocated

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number	None Allocated	DG Class	None Allocated
Packing Group	None Allocated	Subsidiary Risk(s)	None Allocated
Hazchem Code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
CELLULOSE	CAS: 9004-34-6 EC: 232-674-9	Not Available	100%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin Exposure is considered unlikely. Skin irritation is not anticipated.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). Due to product form and application, ingestion is considered unlikely.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition. Finely divided dust may form explosive mixtures with air.

Product Name FRASCSEAL FINE, MEDIUM

Fire and Explosion Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage If spilt (bulk), use personal protective equipment. Moisten with water to prevent a dust hazard and place in sealable containers for disposal.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from alkalis, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for damage to containers.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Cellulose (paper fibre) (a)	SWA (AUS)	--	10	--	--

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face When using large quantities or where heavy contamination is likely, wear dust-proof goggles.

Hands Wear PVC or rubber gloves.

Body When using large quantities or where heavy contamination is likely, wear coveralls.

Respiratory Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance YELLOW TO BROWN SOLID

Odour ODOURLESS

Flammability COMBUSTIBLE

Flash point NOT AVAILABLE

Boiling point NOT AVAILABLE

Melting point 500°C to 518°C

Evaporation rate NOT AVAILABLE

pH 6.5 to 7.5

Vapour density NOT AVAILABLE

Specific gravity 0.9

Solubility (water) INSOLUBLE

Vapour pressure NOT AVAILABLE

Upper explosion limit NOT AVAILABLE

Product Name FRASCSEAL FINE, MEDIUM

Lower explosion limit
Autoignition temperature NOT AVAILABLE
Decomposition temperature NOT AVAILABLE
Viscosity NOT AVAILABLE
Partition coefficient NOT AVAILABLE
% Volatiles NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.
Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid Incompatible with oxidising agents (eg. hypochlorites).
Hazardous Decomposition Products May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Low toxicity. Under normal conditions of use, adverse health effects are not anticipated. However, if dust is generated, over exposure may result in irritation of the eyes, nose, throat and skin.
Eye Low irritant. Contact with dust may result in slight eye irritation.
Inhalation Low irritant. Over exposure to dust may result in irritation of the nose and throat, with coughing. LC50 (rat) is 510 mg/m³/2 hours.
Skin Low irritant. Prolonged or repeated exposure to dust may result in irritation and dermatitis. Dermal LD50 (rabbit) is > 2000 mg/kg.
Ingestion Ingestion is considered unlikely due to product form. Oral LD50 (rat) is > 5000 mg/kg.
Toxicity Data CELLULOSE (9004-34-6)
LC50 (inhalation) > 5800 mg/m³/4 hours (rat)
LD50 (ingestion) > 5000 mg/kg (rat)
LD50 (intraperitoneal) > 31600 mg/kg (rat)
LD50 (skin) > 2000 mg/kg (rabbit)

12. ECOLOGICAL INFORMATION

Environment Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Reuse where possible. No special precautions are required for this product.
Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	None Allocated	None Allocated	None Allocated
Proper Shipping Name	None Allocated	None Allocated	None Allocated
DG Class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary Risk(s)	None Allocated	None Allocated	None Allocated
Packing Group	None Allocated	None Allocated	None Allocated
Hazchem Code	None Allocated		

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
Inventory Listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional Information COMBUSTIBLE - EXPLOSIVE CARBONACEOUS DUST: Carbonaceous/organic dusts have the potential, with dispersion, to present an explosion hazard if an ignition source exists. All equipment used to handle, transfer or store this product **MUST BE** cleaned thoroughly prior to cutting, welding, drilling or exposure to any other form of heat or ignition sources. If bulk stored, containers should be ventilated on a routine basis to avoid vapour accumulation (where applicable, eg for flocculants).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGE (TWA) or WES (WORKPLACE EXPOSURE STANDARD) (NZ): Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this ChemAlert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	PEL	Permissible Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	TLV	Threshold Limit Value
	TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision History

Revision	Description
2.0	Standard SDS Review
1.0	Initial SDS creation

Product Name **FRASCSEAL FINE, MEDIUM**

Report Status This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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Revision: 2
SDS Date: 23 November 2012

End of SDS

SAFETY DATA SHEET

Product Name **FRAC ATTACK**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier name **RHEOCHEM LTD**
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web site <http://www.rheochem.com.au/>
Synonym(s) FRAC-ATTACK
Use(s) LOST CIRCULATION MATERIAL
SDS date 11 July 2013

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R34 Causes burns.

SAFETY PHRASES

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
 S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
 S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN number	None Allocated	DG class	None Allocated
Packing group	None Allocated	Subsidiary risk(s)	None Allocated
Hazchem code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
CALCIUM OXIDE	CAS: 1305-78-8 EC: 215-138-9	Xi;R37/38 Xi;R41	<10%
CALCIUM HYDROXIDE	CAS: 1305-62-0 EC: 215-137-3	C;R34	<5%
CRISTOBALITE	CAS: 14464-46-1 EC: 238-455-4	Not Available	<5%
QUARTZ (SILICA CRYSTALLINE)	CAS: 14808-60-7 EC: 238-878-4	Not Available	<3%
2-PROPENENITRILE-1,3-BUTADIENE RUBBER	CAS: 9003-18-3 EC: 618-357-1	Not Available	<50%
NATURAL RUBBER	CAS: 9006-04-6 EC: 232-689-0	Not Available	<50%
POLYISOPRENE	CAS: 9003-31-0 EC: 618-362-9	Not Available	<50%

Product Name **FRAC ATTACK**

SBR ELASTOMERS	CAS: 9003-55-8 EC: 618-370-2	Not Available	<50%
CELLULOSE	CAS: 9004-34-6 EC: 232-674-9	Not Available	<30%
DIATOMACEOUS EARTH	CAS: 61790-53-2 EC: 612-383-7	Not Available	<15%
FULLERS EARTH	CAS: 8031-18-3 EC: 617-052-0	Not Available	<12%
MAGNESIUM OXIDE	CAS: 1309-48-4 EC: 215-171-9	Not Available	<2%

4. FIRST AID MEASURES

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).
Advice to doctor	Treat symptomatically.
First aid facilities	Eye wash facilities should be available.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases if strongly heated. May evolve calcium oxides when heated to decomposition.
Fire and explosion	Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Use an extinguishing agent suitable for the surrounding fire.
Hazchem code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear Personal Protective Equipment (PPE) as detailed in Section 8 of this SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.
Environmental precautions	Prevent product from entering drains and waterways.
Methods of cleaning up	Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.
References	See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure standards**

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Calcium hydroxide	SWA (AUS)	--	5	--	--
Calcium oxide	SWA (AUS)	--	2	--	--
Cellulose (paper fibre) (a)	SWA (AUS)	--	10	--	--
Cristobalite	SWA (AUS)	--	0.1	--	--
Diatomaceous earth (uncalcined) (a)	SWA (AUS)	--	10	--	--
Magnesium oxide (fume)	SWA (AUS)	--	10	--	--
Silica, Crystalline Quartz	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit allocated.

Engineering controls

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE**Eye / Face**

Wear dust-proof goggles.

Hands

Wear PVC or rubber gloves.

Body

Wear coveralls.

Respiratory

Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	BROWN/GREY POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT RELEVANT
Melting point	NOT AVAILABLE
Evaporation rate	NON VOLATILE
pH	ALKALINE
Vapour density	NOT AVAILABLE
Specific gravity	2.10
Solubility (water)	NEGLIGIBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE
% Volatiles	NOT RELEVANT

10. STABILITY AND REACTIVITY**Chemical stability**

Stable under recommended conditions of storage.

Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

Material to avoid

Incompatible with oxidising agents (eg. hypochlorites) and acids (eg. nitric acid). Other material to

Product Name **FRAC ATTACK**

avoid includes Fluorine, Oxygen Difluoride, Chlorine, Trifluoride and Hydrofluoric Acid.

Hazardous Decomposition Products May evolve calcium oxides when heated to decomposition.**Hazardous Reactions** Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Slightly corrosive - irritant. This product has the potential to cause adverse health effects with over exposure. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in irritation and possible tissue damage. Chronic exposure to crystalline silica may cause lung fibrosis (silicosis), however due to the low levels of crystalline silica in this product, chronic health effects are not anticipated with normal use. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).	
Eye	Slightly corrosive - irritant. Contact may result in irritation, lacrimation, pain, redness, conjunctivitis and possible burns.	
Inhalation	Slightly corrosive - irritant. Over exposure may result in irritation of the nose and throat, with coughing.	
Skin	Slightly corrosive. Contact may result in irritation, redness, pain, rash, dermatitis and possible burns.	
Ingestion	Slightly corrosive. Ingestion may result in ulceration and burns to the mouth and throat, nausea, vomiting, abdominal pain and diarrhoea.	
Toxicity data	CALCIUM HYDROXIDE (1305-62-0) LD50 (ingestion) 7300 mg/kg (mouse)	
	CRISTOBALITE (14464-46-1) TCLo (inhalation) 16 mppcf/8hours/17.9 years (human-fibrosis)	
	QUARTZ (SILICA CRYSTALLINE) (14808-60-7) LCLo (inhalation) 300 ug/m ³ /10 years (human) TCLo (inhalation) 16 000 000 particles/ft ³ /8 hours/17.9 years (human-fibrosis)	
	CELLULOSE (9004-34-6) LC50 (inhalation) > 5800 mg/m ³ /4 hours (rat) LD50 (ingestion) > 5000 mg/kg (rat) LD50 (intraperitoneal) > 31600 mg/kg (rat) LD50 (skin) > 2000 mg/kg (rabbit)	
	MAGNESIUM OXIDE (1309-48-4) TCLo (inhalation) 400 mg/kg (human)	

12. ECOLOGICAL INFORMATION

Toxicity	No information provided.
Persistence and degradability	No information provided.
Bioaccumulative potential	No information provided.
Mobility in soil	No information provided.
Other adverse effects	The manufacturer reports that this product is harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

Waste disposal	Collect without generating dust. Place in clean, sealed containers and dispose of to an approved landfill site. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE**LAND TRANSPORT
(ADG)****SEA TRANSPORT
(IMDG / IMO)****AIR TRANSPORT
(IATA / ICAO)**

Product Name **FRAC ATTACK**

UN number	None Allocated	None Allocated	None Allocated
Proper shipping name	None Allocated	None Allocated	None Allocated
DG class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
Packing group	None Allocated	None Allocated	None Allocated
Hazchem code	None Allocated		

15. REGULATORY INFORMATION

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Inventory Listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (highly acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TLV	Threshold Limit Value
TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision history

Revision	Description
1.5	Standard SDS Review
1.4	Standard SDS Review.
1.3	Standard SDS Review.
1.2	Standard SDS Review.
1.1	Standard SDS Review.
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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Prepared by

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Revision: 1.5
SDS Date: 11 July 2013

End of SDS

MATERIAL SAFETY DATA SHEET



Driscal® D Polymer

Version 1.5

Revision Date 2012-10-31

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

Product information

Trade name : Driscal® D Polymer
Material : 1112534, 1016818

Company : Drilling Specialties Company
10001 Six Pines Drive
The Woodlands, TX 77380

Local : Chevron Phillips Chemicals Australia P/L
Suite 409
685 Burke Road
Camberwell, Victoria
Australia 3124

MSDS Requests: 852-29784899
Technical Information: 61 3 8080 5700
Hours of operation: 8.30a.m - 5.00p.m.

Emergency telephone:

Health:

866.442.9628 (North America)
1.832.813.4984 (International)
61 3 8080 5700 (Australia)

Transport:

North America: CHEMTREC 800.424.9300 or 703.527.3887
Asia: +800 CHEMCALL (+800 2436 2255) China: 0532.8388.9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Chemcare Asia: Tel: +65 6848 9048 - Mob: +65 8382 9188 - Fax: +65 6848 9013
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group
E-mail address : MSDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification

GHS Classification

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS).

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GHS-Labeling

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS).

SECTION 3: Composition/information on ingredients

Synonyms : High Temperature Polymer

Molecular formula : Mixture

Contains no hazardous ingredients according to GHS. :

Remarks : Contains no hazardous ingredients according to GHS.

SECTION 4: First aid measures

General advice : No hazards which require special first aid measures.

If inhaled : If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Keep respiratory tract clear. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

SECTION 5: Firefighting measures

Flash point : Not applicable

Autoignition temperature : No data available

Special protective equipment for fire-fighters : Wear self contained breathing apparatus for fire fighting if necessary.

Further information : Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Fire and explosion protection : Provide appropriate exhaust ventilation at places where dust is formed.

Hazardous decomposition products : No data available.

SECTION 6: Accidental release measures

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- Personal precautions : Avoid dust formation.
- Environmental precautions : If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods for cleaning up : Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage**Handling**

- Advice on safe handling : For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.
- Advice on protection against fire and explosion : Provide appropriate exhaust ventilation at places where dust is formed.

Storage

- Requirements for storage areas and containers : Electrical installations / working materials must comply with the technological safety standards.
- Advice on common storage : No materials to be especially mentioned.

SECTION 8: Exposure controls/personal protection**Engineering measures**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

- Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure.
- Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Eye protection : Safety glasses. Eye wash bottle with pure water.

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Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Protective suit. Safety shoes.

Hygiene measures : General industrial hygiene practice.

SECTION 9: Physical and chemical properties**Information on basic physical and chemical properties****Appearance**

Form : Powder
Physical state : Solid
Color : White
Odor : No odor

Safety data

Flash point : Not applicable
Lower explosion limit : No data available
Upper explosion limit : No data available

Oxidizing properties : no
Autoignition temperature : No data available
Molecular formula : Mixture
Molecular Weight : Not applicable
pH : Not applicable
Pour point : No data available
Boiling point/boiling range : No data available
Vapor pressure : No data available
Relative density : 1,44
Water solubility : Soluble
Partition coefficient: n-octanol/water : POW: < 3
Viscosity, kinematic : No data available
Relative vapor density : No data available
Evaporation rate : No data available

SECTION 10: Stability and reactivity

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Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid : No data available.

Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Driscal® D Polymer
Acute oral toxicity : LD50: not known

Driscal® D Polymer
Acute inhalation toxicity : LC50: not known

Driscal® D Polymer
Acute dermal toxicity : LD50: not known

Driscal® D Polymer
Skin irritation : No skin irritation

Driscal® D Polymer
Eye irritation : No eye irritation

Driscal® D Polymer
Aspiration toxicity : No aspiration toxicity classification.

Driscal® D Polymer
Further information : No data available.

SECTION 12: Ecological information**Ecotoxicity effects**

Toxicity to fish : LC50: > 1.800 mg/l
Exposure time: 96 h
Species: Scophthalmus maximus (Flatfish, Flounder)

Toxicity to daphnia and other aquatic invertebrates : > 10000 MG/KG
Exposure time: 10 Days
Species: Corophium spp (Sediment Reworker)

Toxicity to bacteria : EC50: 2.859 mg/l
Exposure time: 72 h
Species: Skeletonema costatum (Marine Algae)

Elimination information (persistence and degradability)

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Biodegradability : This material is not expected to be readily biodegradable.

Additional ecological information : No data available

SECTION 13: Disposal considerations

The information in this MSDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the MSDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
 NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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

SECTION 15: Regulatory information**National legislation**

Major Accident Hazard Legislation : 96/82/EC Update: 2003
 Directive 96/82/EC does not apply

National legislation

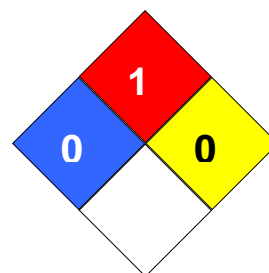
Standard for the Uniform Scheduling of Medicines and Poisons : No poison schedule number allocated

Notification status

Europe REACH : On the inventory, or in compliance with the inventory
 United States of America US.TSCA : On TSCA Inventory
 Canada DSL : All components of this product are on the Canadian DSL list.
 Australia AICS : On the inventory, or in compliance with the inventory
 New Zealand NZIoC : Not in compliance with the inventory
 Japan ENCS : Not in compliance with the inventory
 Korea KECI : Not in compliance with the inventory
 Philippines PICCS : On the inventory, or in compliance with the inventory
 China IECSC : On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 0
 Fire Hazard: 1
 Reactivity Hazard: 0



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Further information

Legacy MSDS Number : 244990

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this MSDS pertains only to the product as shipped.

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

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name DEFOAM AP 400
Synonym(s) DEFOAMER

1.2 Uses and uses advised against

Use(s) DEFOAM IN DRILLING FLUIDS

1.3 Details of the supplier of the product

Supplier name **NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD**
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	Identification	Classification		Content
		GHS	Risk	
POLYETHYLENE GLYCOL	CAS: 25322-68-3 EC: 500-038-2	Not Available	Not Available	45 to 60%
OCTAN-2-OL	CAS: 123-96-6 EC: 204-667-0	Not Available	Not Available	40 to 55%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

PRODUCT NAME DEFOAM AP 400

First aid facilities No information provided.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve carbon oxides and hydrocarbons when heated to decomposition.

5.3 Advice for firefighters

Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in Section 8. Clear area of all unprotected personnel. Ventilate area where possible. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then cover/absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Type A (Organic vapour) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	CLEAR COLOURLESS LIQUID
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	7 to 8 (5% solution)
Vapour density	NOT AVAILABLE
Specific gravity	1.00
Solubility (water)	SOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (eg. hypochlorites) and acids (eg. nitric acid).

10.6 Hazardous decomposition products

May evolve carbon oxides and hydrocarbons when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Health hazard summary	Low toxicity - low irritant. This product has the potential to irritate mucous membranes. Use safe work practices to avoid eye or skin contact and inhalation. Due to the low vapour pressure of this product, an inhalation hazard is not anticipated with normal use. Chronic exposure to some glycols may result in liver and kidney damage.
Eye	Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low to moderate irritant. Over exposure to vapours may result in irritation of the nose and throat, with coughing. High level exposure may result in dizziness, nausea and headache. Due to the low vapour pressure, an inhalation hazard is not anticipated with normal use.
Skin	Low irritant. Prolonged or repeated contact may result in mild irritation, rash and dermatitis.
Ingestion	Low toxicity. Ingestion of large quantities may result in nausea, vomiting and gastrointestinal irritation.
Toxicity data	POLYETHYLENE GLYCOL (25322-68-3) LD50 (ingestion) 33750 mg/kg (rat)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

ATMOSPHERE: Vapour phase glycols are expected to degrade fairly rapidly by reaction with hydroxyl radicals (eg half-life 32 hours for propylene glycol). Removal from air by rainfall is possible. WATER: Should degrade relatively rapidly via biodegradation. SOIL: If released to soil, relatively rapid biodegradation should also occur. Leaching to groundwater may occur.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved landfill site. For larger amounts, contact the manufacturer for additional information. Prevent contamination of drains or waterways as aquatic life may be threatened and environmental damage may result.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code None Allocated

15. REGULATORY INFORMATION

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

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Classifications	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals. The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].
Hazard codes	None allocated.
Risk phrases	None allocated.
Safety phrases	None allocated.
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information	<p>RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.</p> <p>EXPOSURE STANDARDS - TIME WEIGHTED AVERAGE (TWA) or WES (WORKPLACE EXPOSURE STANDARD) (NZ): Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).</p> <p>PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.</p> <p>HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.</p>
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PRODUCT NAME DEFOAM AP 400**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
1.0	Initial SDS Creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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Revision: 1
SDS date: 20 August 2014

[End of SDS]

MATERIAL SAFETY DATA SHEET

Product Name **CITRIC ACID****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>

Synonym(s) 2-HYDROXY-1,2,3-PROPANETRICARBOXYLIC ACID • CITRIC ACID ANHYDROUS • CITRIC ACID MONOHYDRATE

Use(s) INDUSTRIAL APPLICATIONS

SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R36/37/38 Irritating to eyes, respiratory system and skin.

SAFETY PHRASES

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S37/39 Wear suitable gloves and eye/face protection.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated**Packing Group** None Allocated **Hazchem Code** None Allocated**3. COMPOSITION/ INFORMATION ON INGREDIENTS**

Ingredient	Formula	CAS No.	Content
CITRIC ACID, ANHYDROUS	C6-H8-O7	77-92-9	>99%
WATER	H2O	7732-18-5	<1%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

Product Name **CITRIC ACID**

5. FIRE FIGHTING MEASURES

Flammability	Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Fire and Explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	If spilt (bulk), use personal protective equipment. Ventilate area where possible. Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from moisture, oxidising agents and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds	No exposure standard(s) allocated.
Biological Limits	No Biological Limit Value allocated.
Engineering Controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.
PPE	Wear dust-proof goggles and PVC or rubber gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. At high dust levels, wear: a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE CRYSTALLINE POWDER	Solubility (water)	1330 kg/m ³ @ 20°C
Odour	ODOURLESS	Specific Gravity	1.665
pH	2.2 (0.1M Solution)	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	COMBUSTIBLE
Vapour Density	NOT AVAILABLE	Flash Point	174°C
Boiling Point	175°C (Decomposes)	Upper Explosion Limit	NOT AVAILABLE
Melting Point	153°C	Lower Explosion Limit	NOT AVAILABLE
Evaporation Rate	NOT AVAILABLE		
Autoignition Temperature	345°C		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites).
Hazardous Decomposition Products	May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity - slightly corrosive. Citric acid is not anticipated to present adverse health effects in industrial applications. Use safe work practices to avoid eye or skin contact and inhalation. Citric acid has the potential to cause allergic effects.
Eye	Slightly corrosive - irritant. Contact may result in irritation, lacrimation, pain, redness, conjunctivitis and possible burns.
Inhalation	Irritant. Over exposure to dust may result in irritation of the nose and throat, with coughing.
Skin	Slightly corrosive. Contact may result in irritation, redness, pain, rash, dermatitis and possible burns. May cause sensitisation by skin contact.
Ingestion	Slightly corrosive. Ingestion may result in ulceration and burns to the mouth and throat, nausea, vomiting, abdominal pain and diarrhoea.
Toxicity Data	CITRIC ACID, ANHYDROUS (77-92-9) LD50 (Ingestion): 3000 mg/kg (rat) LD50 (Intraperitoneal): 290 mg/kg (rat) LD50 (Intravenous): 42 mg/kg (mouse) LDLo (Ingestion): 7000 mg/kg (rabbit)

12. ECOLOGICAL INFORMATION

Environment	WATER: If citric acid is released to water, it is expected to biodegrade rapidly. May be toxic to fish at moderately high levels (120 ppm is fatal to daphnia; 894 ppm with pH 4 is fatal to goldfish) due to acidic nature. Fairly high biological oxygen demand (BOD) which may cause oxygen depletion in large spills. Citric acid occurs naturally in many plants.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Neutralise with lime, anion exchanger or similar. For small amounts absorb with sand or similar and dispose of to an approved landfill site. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information	EXPOSURE STANDARDS - TIME WEIGHTED AVERAGES: Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).
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ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indices(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m³ - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

Product Name **CITRIC ACID**

ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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SDS Date 01 Nov 2010

End of Report

Product Name **CAUSTIC SODA****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) CAUSTIC SODA • SODA LYE • SODIUM HYDROXIDE SOLID
Use(s) MANUFACTURE OF CHEMICALS • REAGENT • SCRUBBING AGENT
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R35 Causes severe burns.

SAFETY PHRASES

S1/2 Keep locked up and out of reach of children.

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S37/39 Wear suitable gloves and eye/face protection.

S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. 1823 **DG Class** 8 **Subsidiary Risk(s)** None Allocated
Packing Group II **Hazchem Code** 2X

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
SODIUM HYDROXIDE	Na-OH	1310-73-2	>98%
SILICA, AMORPHOUS	Si-O2	7631-86-9	0.0030%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator where an inhalation risk exists. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases if strongly heated. May evolve flammable hydrogen gas in contact with some metals.
Fire and Explosion	Treat as per requirements for Surrounding Fires: Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Prevent contamination of drains or waterways.
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

Spillage	If spilt (bulk), notify local authorities where appropriate. Collect and reuse where possible. Use personal protective equipment. Contain spillage, then collect and place in suitable containers for disposal. Clean spill site with soap solution.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids, metals, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills. Large storage areas should have appropriate ventilation systems. It is recommended that the storage temperature be maintained between 15 and 25°C. Unsuitable storage containers: aluminium, tin or zinc.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
Fumed silica (respirable dust)	SWA (AUS)	--	2 mg/m3	--	--
Sodium hydroxide (peak limitation)	SWA (AUS)	--	2 mg/m3	--	--

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE Wear dust-proof goggles, a PVC apron, rubber boots, rubber or PVC gloves, a faceshield and coveralls. At high dust levels, wear: a Full-face Class P3 (Particulate) or an Air-line respirator. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE DELIQUESCENT PEARLS	Solubility (water)	1110 kg/m3 @ 20°C
Odour	ODOURLESS	Specific Gravity	2.12
pH	13.5 (1 % solution)	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	1390°C	Upper Explosion Limit	NOT RELEVANT
Melting Point	318°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents, acids (eg. nitric acid), metals, heat and ignition sources.
Hazardous Decomposition Products	May evolve toxic gases if heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Highly corrosive. This product has the potential to cause serious adverse health effects. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in severe burns with corrosive tissue damage. Upon dilution, the potential for corrosive effects may be reduced.
Eye	Highly corrosive. Contact may result in irritation, lacrimation, pain, redness, conjunctivitis and corneal burns with possible permanent damage.
Inhalation	Corrosive. Over exposure to dust may result in mucous membrane irritation of the respiratory tract, coughing and bronchitis. High level exposure may result in intense thirst, ulceration, lung tissue damage, chemical pneumonitis and pulmonary oedema. Effects may be delayed.
Skin	Corrosive. Contact may result in irritation, redness, pain, rash, dermatitis and possible burns. Effects may be delayed.
Ingestion	Highly corrosive - toxic. Ingestion may result in burns to the mouth and throat, nausea, vomiting, ulceration of the gastrointestinal tract, oedema, rapid pulse, shock, unconsciousness, convulsions and death.
Toxicity Data	SODIUM HYDROXIDE (1310-73-2) LD50 (Intraperitoneal): 40 mg/kg (mouse) LDLo (Ingestion): 1.57 mg/kg (human) SILICA, AMORPHOUS (7631-86-9) LD50 (Ingestion): 3160 mg/kg (rat)

12. ECOLOGICAL INFORMATION

Environment	WATER: If released to waterways, alkaline products may change the pH of the waterway. Fish will die if the pH reaches 10-11 (goldfish 10.9, bluegill 10.5). SOIL: May leach to groundwater with toxic effects on aquatic life as above. ATMOSPHERE: Not expected to reside in the atmosphere. Drops or particles released to atmosphere should be removed by gravity and/or be rained out.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Add to large quantity of water and neutralise (to pH 6-8) by SLOW addition of 6 mol/L hydrochloric acid (HCl). Discharge neutral solutions to drain or sewer with excess water. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION



CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	SODIUM HYDROXIDE, SOLID			Subsidiary Risk(s)	None Allocated
UN No.	1823	DG Class	8	GTEPG	8A1
Packing Group	II	Hazchem Code	2X		

Product Name CAUSTIC SODA

IATA

Shipping Name SODIUM HYDROXIDE, SOLID
UN No. 1823 **DG Class** 8 **Subsidiary Risk(s)** None Allocated
Packing Group II

IMDG

Shipping Name SODIUM HYDROXIDE, SOLID
UN No. 1823 **DG Class** 8 **Subsidiary Risk(s)** None Allocated
Packing Group II

15. REGULATORY INFORMATION

Poison Schedule Classified as a Schedule 6 (S6) Poison using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGE (TWA) or WES (WORKPLACE EXPOSURE STANDARD) (NZ): Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indices(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m³ - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate

Product Name CAUSTIC SODA

safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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SDS Date 01 Nov 2010

End of Report

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **CALCIUM CARBONATE**
Synonym(s) ABGRIT • CIRCAL • LIMESTONE • MARBLE • OMYACAL • OMYACARB • RHEOCARB • STONEDUST

1.2 Uses and uses advised against

Use(s) DRILLING FLUID ADDITIVE • WEIGHTING AGENT

1.3 Details of the supplier of the product

Supplier name **NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD**
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	<1%
CALCIUM CARBONATE	471-34-1	207-439-9	>96%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

First aid facilities No information provided.

PRODUCT NAME CALCIUM CARBONATE

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

If spilt, collect and reuse where possible. Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Calcium carbonate (Limestone, Marble, Whiting)	SWA (AUS)	--	10	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--

Biological limits No Biological Limit Value allocated.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE

- Eye / Face** Wear dust-proof goggles.
- Hands** When using large quantities or where heavy contamination is likely, wear PVC or rubber gloves.
- Body** When using large quantities or where heavy contamination is likely, wear coveralls.
- Respiratory** Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	OFF-WHITE POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	840°C (Decomposes)
Melting point	825°C
Evaporation rate	NOT AVAILABLE
pH	9
Vapour density	NOT AVAILABLE
Specific gravity	2.7
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

% Volatiles	NOT AVAILABLE
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with acids (e.g. nitric acid), fluorine, aluminium (hot) and ammonium salts. Incompatible with oxidising agents (e.g. hypochlorites).

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	This product is expected to be of low toxicity. Based on available data, the classification criteria are not met. LD50 (Ingestion) = 6450 mg/kg (rat).
Skin	Not classified as a skin irritant. Contact may result in mild irritation, redness and rash.
Eye	Not classified as an eye irritant. Contact may cause discomfort, lacrimation and redness.
Sensitization	This product is not known to be a skin or respiratory sensitiser.
Mutagenicity	Insufficient data available to classify as a mutagen.
Carcinogenicity	Insufficient data available to classify as a carcinogen.
Reproductive	Insufficient data available to classify as a reproductive toxin.
STOT – single exposure	Not classified as causing organ effects from single exposure.
STOT – repeated exposure	Not classified as causing organ effects from repeated exposure. Chronic exposure to respirable silica may result in pulmonary fibrosis (silicosis). However, given the low levels present, over exposure is not anticipated.
Aspiration	This product does not present an aspiration hazard.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Calcium carbonate occurs naturally in a wide variety of substances including limestone, marble and egg shells. It is not anticipated to cause adverse environmental effects.

12.2 Persistence and degradability

Dissolved calcium carbonate dissociates into calcium and carbonate ions. Calcium ions will be assimilated by living organisms in the water and the carbonate will become part of the carbon cycle.

12.3 Bioaccumulative potential

This product does not bioaccumulate.

12.4 Mobility in soil

Due to its limited solubility, calcium carbonate precipitates and deposits on the sediment.

12.5 Other adverse effects

Avoid contamination of waterways.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer/supplier for additional information (if required).
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

PRODUCT NAME CALCIUM CARBONATE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code None Allocated

15. REGULATORY INFORMATION

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

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes None allocated.

Risk phrases None allocated.

Safety phrases None allocated.

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information **RESPIRATORS:** In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE CONTROL: If utilised in a closed system the potential for over exposure is reduced. If not used in a closed system, local exhaust ventilation is recommended to control exposure. Provide eye wash and safety shower in close proximity to points of potential exposure. Where the potential for an inhalation risk exists, an approved respirator may be required. Do not eat, store, consume food, tobacco or drink in areas where product is used.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME CALCIUM CARBONATE**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
2.2	Standard SDS Review Standard SDS Review
2.1	Standard SDS Review.
2.0	Converted to GHS.
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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Prepared by

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Revision: 2.2
SDS date: 07 January 2015

[End of SDS]

SAFETY DATA SHEET

Product Name **BARITE**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) BARIUM SULPHATE · RHEOCHEM BARITE, RHEOBAR
Use(s) DRILLING FLUID ADDITIVE · WEIGHTING AGENT
SDS Date 07 September 2012

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

None allocated

SAFETY PHRASES

None allocated

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number	None Allocated	DG Class	None Allocated
Packing Group	None Allocated	Subsidiary Risk(s)	None Allocated
Hazchem Code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
QUARTZ (SILICA CRYSTALLINE)	CAS: 14808-60-7 EC: 238-878-4	Not Available	<3%
BARIUM SULPHATE	CAS: 7727-43-7 EC: 231-784-4	Not Available	>89%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

Advice to Doctor Treat symptomatically.

First Aid Facilities Eye wash facilities should be available.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases (sulphur oxides) when heated to decomposition.
Fire and Explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Prevent contamination of drains or waterways.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	If spilt (bulk), use personal protective equipment. Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Barium sulphate	SWA (AUS)	--	10	--	--
Silica, Crystalline Quartz	SWA (AUS)	--	0.1	--	--

Biological Limits	No Biological Limit Value allocated.
Engineering Controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE	
Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	OFF-WHITE POWDER
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT RELEVANT
Melting point	> 1300°C
Evaporation rate	NOT AVAILABLE
pH	8.2 (20% Slurry)
Vapour density	NOT AVAILABLE

Product Name **BARITE**

Specific gravity	4.20
Solubility (water)	INSOLUBLE
Vapour pressure	NOT RELEVANT
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Compatible with most commonly used materials.
Hazardous Decomposition Products	May evolve toxic gases (sulphur oxides) when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity. Under normal conditions of use, adverse health effects are not anticipated. Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). However, due to the low levels of crystalline silica, chronic health effects are not anticipated with normal use. Crystalline silica is classified as carcinogenic to humans (IARC Group 1).
Eye	Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Irritant. Over exposure to dust may result in mucous membrane irritation of the respiratory tract. Chronic exposure to crystalline silica may result in silicosis (lung fibrosis). Crystalline silica is classified as carcinogenic to humans (IARC Group 1).
Skin	Low irritant. Prolonged or repeated exposure to dust may result in irritation and dermatitis.
Ingestion	Low toxicity. Ingestion of large quantities may result in nausea, vomiting and gastrointestinal irritation.
Toxicity Data	QUARTZ (SILICA CRYSTALLINE) (14808-60-7) LCLo (inhalation) 300 ug/m ³ /10 years (human) TCLo (inhalation) 16 000 000 particles/ft ³ /8 hours/17.9 years (human-fibrosis)

12. ECOLOGICAL INFORMATION

Environment	This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Fish toxicity: LC50 (Rainbow trout) = 7500 ppm/96 hour.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Dispose of to an approved landfill site. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	None Allocated	None Allocated	None Allocated
Proper Shipping Name	None Allocated	None Allocated	None Allocated
DG Class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary Risk(s)	None Allocated	None Allocated	None Allocated

Product Name **BARITE**

Packing Group None Allocated None Allocated None Allocated
Hazchem Code None Allocated

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
Inventory Listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional Information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this ChemAlert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TLV	Threshold Limit Value
TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision History

Revision	Description
1.1	Standard SDS Review
1.0	Initial SDS creation

Product Name **BARITE**

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

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Prepared By

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Web: www.rmt.com.au

Revision: 1.1

SDS Date: 07 September 2012

End of SDS

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name AVAPERM NF
Synonym(s) F003132 - SDS CODE

1.2 Uses and uses advised against

Use(s) INHIBITOR IN DRILLING FLUIDS

1.3 Details of the supplier of the safety data sheet

Supplier name NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification Acute Toxicity: Oral: Category 4
Acute Toxicity: Skin: Category 4
Skin Corrosion/Irritation: Category 2
Serious Eye Damage / Eye Irritation: Category 2A
Specific Target Organ Systemic Toxicity (Single Exposure): Category 3

2.2 Label elements

Signal word WARNING

Pictograms



Hazard statement(s)

H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Prevention statement(s)

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME AVAPERM NF**Response statement(s)**

P301 + P312 IF SWALLOWED: Call a POISON CENTRE or doctor/physician if you feel unwell.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321 Specific treatment is advised - see first aid instructions.
P330 Rinse mouth.
P332 + P337 + P313 If skin or eye irritation occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before re-use.

Storage statement(s)

P403 + P233 Store in a well-ventilated place. Keep container tightly closed (applies if the substance is volatile so as to generate a hazardous atmosphere).
P405 Store locked up.

Disposal statement(s)

P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	Identification	Classification	Content
HYDROGENATED HEXANEDINITRILE CHLORIDE	Not Available		35 to 70%
WATER	CAS: 7732-18-5 EC: 231-791-2		30 to 65%

Ingredient Notes

This product is mixture of 30-50% Hexanedinitrile, 5-20% Hydrochloric acid (as pH corrector) and water. Hydrochloric acid is used to neutralise hexanedinitrile to become the salt with slightly alkali (pH 9-11).

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

First aid facilities Eye wash facilities and safety shower are recommended.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases (carbon/ nitrogen oxides, hydrocarbons) when heated to decomposition.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in Section 8 of this SDS. Clear area of all unprotected personnel. Ventilate area where possible. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then cover/absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Type A (Organic vapour) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	LIQUID
Odour	PUNGENT ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	100°C (Approximately)
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	9 to 10
Vapour density	NOT AVAILABLE
Specific gravity	1.00 to 1.10
Solubility (water)	SOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

% Volatiles	NOT AVAILABLE
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Hazardous polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), nitrites, heat and ignition sources. Incompatible with Isocyanates, aldehydes, ketones, anhydrides, phenols, nitrates, halogenated compounds.

10.6 Hazardous decomposition products

May evolve toxic gases (carbon/ nitrogen oxides, hydrocarbons) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Health hazard summary	Harmful - irritant. This product has the potential to cause adverse health effects with over exposure. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in irritation to the eyes, skin and respiratory system.
Eye	Irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Irritant. Over exposure to vapours may result in respiratory irritation, nausea, dizziness and headache. High level exposure may result in drowsiness and breathing difficulties.
Skin	Irritant. Contact may result in drying and defatting of the skin, rash and dermatitis.
Ingestion	Harmful. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain, diarrhoea, headache, dizziness and drowsiness with large quantities.
Toxicity data	No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

This product is registered on Offshore Chemical Notification Scheme Gold, Gold, Gold for HQ Band 17.5", 12.25" and 8.5" respectively.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved landfill site. For larger amounts, contact the manufacturer for additional information. Prevent contamination of drains or waterways as aquatic life may be threatened and environmental damage may result.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN number	None Allocated	None Allocated	None Allocated
14.2 UN proper shipping name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard classes			
DG class	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
14.4 Packing group	None Allocated	None Allocated	None Allocated
14.5 Environmental hazards	None Allocated		
14.6 Special precautions for user			
Hazchem code	None Allocated		

15. REGULATORY INFORMATION

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

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications

Xi	Irritant
Xn	Harmful

Risk phrases

R21/22	Harmful in contact with skin and if swallowed.
R36/37/38	Irritating to eyes, respiratory system and skin.

Safety phrases

S1/2	Keep locked up and out of reach of children.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.
EUROPE:EINECS (European Inventory of Existing Chemical Substances)
All components are listed on EINECS, or are exempt.

16. OTHER INFORMATION

Additional information

The manufacturer indicates the product is mixture of 30-50% Hexanedinitrile, 5-20% Hydrochloric acid (as pH corrector) and water. Hydrochloric acid is used to neutralise hexanedinitrile to become the salt with slightly alkali (pH 9-11).

AMINE: CAUTION THIS PRODUCT CONTAINS AN AMINE. DO NOT ADD NITRITES or other NITROSATING AGENTS to this product due to the potential for NITROSAMINE formation. Nitrosamines are potent carcinogens and some have been shown to cause severe acute (heart, brain, blood, liver - kidney) damage as well as chronic effects (reproductive effects, liver - lung and kidney tumours).

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGE (TWA) or WES (WORKPLACE EXPOSURE STANDARD) (NZ): Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PRODUCT NAME AVAPERM NF**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
1.0	Initial SDS Creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

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Prepared by

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Email: info@rmt.com.au
Web: www.rmt.com.au.

Revision: 1
SDS date: 08 April 2014

[End of SDS]

Product Name **XANTHAN GUM (P)****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) XANTHAN GUM (BIOPOLYMER)
Use(s) DRILLING FLUID ADDITIVE • VISCOSITY MODIFIER
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
XANTHAN GUM	Not Available	11138-66-2	>90%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting. Ingestion is considered unlikely due to product form.

Advice to Doctor Treat symptomatically.

First Aid Facilities Eye wash facilities and safety shower should be available.

5. FIRE FIGHTING MEASURES

Flammability Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition. Finely divided dust may form explosive mixtures with air.

Fire and Explosion Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways.

Product Name XANTHAN GUM (P)

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds No exposure standard(s) allocated.

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas.

PPE Wear dust-proof goggles, PVC or rubber gloves and a Class P1 (Particulate) respirator. When using large quantities or where heavy contamination is likely, wear: coveralls.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	LIGHT BEIGE POWDER	Solubility (water)	MISCIBLE
Odour	SLIGHT ODOUR	Specific Gravity	1.5
pH	NOT AVAILABLE	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	COMBUSTIBLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT RELEVANT
Melting Point	NOT AVAILABLE	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents and acids (eg. nitric acid).
Hazardous Decomposition Products	May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity. Under normal conditions of use, adverse health effects are not anticipated. This product is generally considered to be of low toxicity. Use safe work practices to avoid eye contact, prolonged skin contact and dust generation - inhalation.
Eye	Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.
Skin	Low irritant. Prolonged or repeated contact may result in mild irritation.
Ingestion	Low toxicity. Ingestion may result in gastrointestinal irritation. However, due to product form ingestion is considered unlikely. Maintain good personal hygiene standards.
Toxicity Data	No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

Environment	This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer if additional information is required.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information	RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.
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ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indices(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m³ - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency

Product Name **XANTHAN GUM (P)**

and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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SDS Date 01 Nov 2010

End of Report

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name TRIETHANOLAMINE
Synonym(s) RHEOCHEM TRIETHANOLAMINE

1.2 Uses and uses advised against

Use(s) CHEMICAL INTERMEDIATE • LABORATORY REAGENT • SOLVENT

1.3 Details of the supplier of the product

Supplier name NEWPARK DRILLING FLUIDS (AUSTRALIA) LTD
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Website www.newpark.com

1.4 Emergency telephone number(s)

Emergency 1800 127 406 (Australia); +64 3 3530199 (International)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification Serious Eye Damage / Eye Irritation: Category 1
Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 2

2.2 Label elements

Signal word DANGER

Pictograms



Hazard statement(s)

H318 Causes serious eye damage.
H373 May cause damage to organs through prolonged or repeated exposure.

Prevention statement(s)

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response statement(s)

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTRE or doctor/physician.
P314 Get medical advice/attention if you feel unwell.

Storage statement(s)

None allocated.

Disposal statement(s)

P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	Identification	Classification		Content
		GHS	Risk	
TRIETHANOLAMINE	CAS: 102-71-6 EC: 203-049-8	Not Available	Not Available	>60%
DIETHANOLAMINE	CAS: 111-42-2 EC: 203-868-0	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT RE 2, H373	Xn;R22, Xi;R38, Xi;R41, Xn;R48/22	10 to <30%
ETHANOLAMINE	CAS: 141-43-5 EC: 205-483-3	Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Acute Tox. 4, H332	Xn;R20/21/22, C;R34	<10%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use a Type A (Organic vapour) respirator or an Air-line respirator (in poorly ventilated areas). Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting. Rinse mouth out with water and give plenty of water to drink.

First aid facilities No information provided.

4.2 Most important symptoms and effects, both acute and delayed

Over exposure may result in irritation to the eyes, nose and respiratory system. May cause allergic contact dermatitis.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways.

5.2 Special hazards arising from the substance or mixture

Combustible. May evolve toxic gases (carbon/ nitrogen oxides, amines, ammonia, hydrocarbons) when heated to decomposition.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in Section 8. Clear area of all unprotected personnel. Ventilate area where possible. Contact emergency services where appropriate.

PRODUCT NAME TRIETHANOLAMINE

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then cover/absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills. Store as a Class C2 Combustible Liquid (AS1940).

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Diethanolamine (h)	SWA (AUS)	3	13	--	--
Ethanolamine	SWA (AUS)	3	7.5	6	15
Triethanolamine	SWA (AUS)	--	5	--	--

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Type A (Organic vapour) respirator. If spraying, wear a Type A-Class P1 (Organic gases/vapours and Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	CLEAR LIQUID
Odour	MILD AMMONIACAL ODOUR
Flammability	CLASS C2 COMBUSTIBLE
Flash point	190°C

9.1 Information on basic physical and chemical properties

Boiling point	335°C
Melting point	12°C
Evaporation rate	< 0.01 (n-Butyl acetate = 1)
pH	10.5 (1 % Solution)
Vapour density	4.80 (Air = 1)
Specific gravity	1.12
Solubility (water)	SOLUBLE
Vapour pressure	< 1 kPa @ 20°C
Upper explosion limit	NOT AVAILABLE
Lower explosion limit	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
Autoignition temperature	375°C
Decomposition temperature	NOT AVAILABLE
Viscosity	450 cP @ 25°C
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

% Volatiles	NOT AVAILABLE
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Hazardous polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), nitrites, heat and ignition sources. Also incompatible with organic anhydrides, isocyanates, vinyl acetate, acrylates, substituted allyls, alkylene oxides, epichlorohydrin, aldehydes, copper, brass and aluminium.

10.6 Hazardous decomposition products

May evolve toxic gases (carbon/ nitrogen oxides, amines, ammonia, hydrocarbons) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	May be harmful if swallowed, in contact with skin, and/or if inhaled. LD50 (oral) = 2200 mg/kg (rabbit).
Skin	Contact may result in mild irritation, redness, pain and rash.
Eye	Contact may result in irritation, lacrimation, pain and redness. May result in burns with prolonged contact.
Sensitization	Triethanolamine has been reported to cause allergic contact dermatitis in humans. It is not known to cause respiratory sensitisation.
Mutagenicity	Insufficient data available to classify as a mutagen.
Carcinogenicity	Triethanolamine and diethanolamine are not classifiable as to carcinogenicity to humans (IARC Group 3).
Reproductive	Insufficient data available to classify as a reproductive toxin.
STOT – single exposure	Over exposure may result in irritation of the nose and throat, with coughing. High level exposure may result in breathing difficulties.
STOT – repeated exposure	Diethanolamine may cause damage to organs (liver) through prolonged and repeated exposure.
Aspiration	This product is not expected to present an aspiration hazard.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

The substance is expected to be readily biodegradable according to the AS 4351 Part 2 test method.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

In soil and water, triethanolamine will biodegrade fairly rapidly following acclimation (half-life in the order of days to weeks). In soil, residual triethanolamine may leach to groundwater. LC50 (shrimp): > 100 ppm.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Reduce with sodium thiosulphate/ bisulphite (not strong reducing agent), acidify with 3M sulphuric acid. Scoop into a container of water and neutralise with soda ash. Absorb with sand or similar and dispose of to approved landfill site. Contact the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code None Allocated

15. REGULATORY INFORMATION

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

Poison schedule Classified as a Schedule 5 (S5) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes Xi Irritant
Xn Harmful

Risk phrases R41 Risk of serious damage to eyes.
R48/22 Harmful: danger of serious damage to health by prolonged exposure if swallowed.

Safety phrases S25 Avoid contact with eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S39 Wear eye/face protection.

PRODUCT NAME TRIETHANOLAMINE

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
2.0	Converted to GHS.
1.0	Initial SDS creation

PRODUCT NAME TRIETHANOLAMINE

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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Revision: 2

SDS date: 25 July 2014

[End of SDS]

SAFETY DATA SHEET

Product Name **STRATA-VANGUARD**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier name **RHEOCHEM LTD**
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web site <http://www.rheochem.com.au/>
Synonym(s) STRATA VANGUARD
Use(s) DRILLING FLUID ADDITIVE
SDS date 11 July 2013

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

None allocated

SAFETY PHRASES

None allocated

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN number	None Allocated	DG class	None Allocated
Packing group	None Allocated	Subsidiary risk(s)	None Allocated
Hazchem code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
CRISTOBALITE	CAS: 14464-46-1 EC: 238-455-4	Not Available	<5%
QUARTZ (SILICA CRYSTALLINE)	CAS: 14808-60-7 EC: 238-878-4	Not Available	<2%
2-PROPENENITRILE-1,3-BUTADIENE RUBBER	CAS: 9003-18-3 EC: 618-357-1	Not Available	<50%
NATURAL RUBBER	CAS: 9006-04-6 EC: 232-689-0	Not Available	<50%
POLYISOPRENE	CAS: 9003-31-0 EC: 618-362-9	Not Available	<50%
SBR ELASTOMERS	CAS: 9003-55-8 EC: 618-370-2	Not Available	<50%
CELLULOSE	CAS: 9004-34-6 EC: 232-674-9	Not Available	<30%
DIATOMACEOUS EARTH, FLUX CALCINED	CAS: 68855-54-9 EC: 272-489-0	Not Available	<15%

FULLERS EARTH	CAS: 8031-18-3 EC: 617-052-0	Not Available	<10%
LIMESTONE	CAS: 1317-65-3 EC: 215-279-6	Not Available	<10%
POLYETHYLENE	CAS: 9002-88-4 EC: 618-339-3	Not Available	<3%
MAGNESIUM OXIDE	CAS: 1309-48-4 EC: 215-171-9	Not Available	<1%

4. FIRST AID MEASURES

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.
Advice to doctor	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases if strongly heated.
Fire and explosion	No fire or explosion hazard exists.
Extinguishing	Use an extinguishing agent suitable for the surrounding fire.
Hazchem code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear Personal Protective Equipment (PPE) as detailed in Section 8 of this SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.
Environmental precautions	Prevent product from entering drains and waterways.
Methods of cleaning up	Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.
References	See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure standards**

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Calcium carbonate	SWA (AUS)	--	10	--	--
Cellulose (paper fibre) (a)	SWA (AUS)	--	10	--	--
Cristobalite	SWA (AUS)	--	0.1	--	--
Magnesium oxide (fume)	SWA (AUS)	--	10	--	--
Silica, Crystalline Quartz	SWA (AUS)	--	0.1	--	--

Biological limits

No biological limit allocated.

Engineering controls

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

PPE**Eye / Face**

Wear dust-proof goggles.

Hands

Wear PVC or rubber gloves.

Body

When using large quantities or where heavy contamination is likely, wear coveralls.

Respiratory

Where an inhalation risk exists, wear a Class P1 (Particulate) respirator. At high dust levels, wear a Powered Air Purifying Respirator (PAPR) with Class P3 (Particulate) filter or a Full-face Class P3 (Particulate) respirator.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	TAN COLOURED POWDER
Odour	MILD ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT AVAILABLE
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	6.3 (5% Suspension)
Vapour density	NOT AVAILABLE
Specific gravity	2.1
Solubility (water)	INSOLUBLE
Vapour pressure	1 mm Hg @ 20°C
Upper explosion limit	NOT AVAILABLE
Lower explosion limit	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE
% Volatiles	NOT AVAILABLE

10. STABILITY AND REACTIVITY**Chemical stability**

Stable under recommended conditions of storage.

Conditions to avoid

Avoid contact with incompatible substances.

Material to avoid

Incompatible with acids (eg. nitric acid). Also incompatible with oxygen difluoride, chlorine and trifluoride.

Product Name STRATA-VANGUARD

Proper shipping name	None Allocated	None Allocated	None Allocated
DG class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
Packing group	None Allocated	None Allocated	None Allocated
Hazchem code	None Allocated		

15. REGULATORY INFORMATION

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
Inventory Listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information	RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.
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PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	PEL	Permissible Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	TLV	Threshold Limit Value
	TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision history

Revision	Description
1.4	Standard SDS Review
1.3	Standard SDS Review.
1.2	Standard SDS Review.
1.1	Standard SDS Review.
1.0	Initial SDS creation

Product Name **STRATA-VANGUARD**

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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Web: www.rmt.com.au.

Revision: 1.4
SDS Date: 11 July 2013

End of SDS

SAFETY DATA SHEET

Product Name **SODIUM SULPHITE**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) SODIUM SULFITE
Use(s) ANTIOXIDANT · FOOD PRESERVATIVE · LABORATORY REAGENT · PAPER INDUSTRY · PHOTOGRAPHIC DEVELOPER · REDUCING AGENT · WATER TREATMENT
SDS Date 12 November 2012

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R31 Contact with acids liberates toxic gas.

SAFETY PHRASES

S25 Avoid contact with eyes.

S46 If swallowed, contact a doctor or Poisons Information Centre immediately and show container or label.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number	None Allocated	DG Class	None Allocated
Packing Group	None Allocated	Subsidiary Risk(s)	None Allocated
Hazchem Code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
SODIUM CARBONATE	CAS: 497-19-8 EC: 207-838-8	Xi;R36	<0.1%
SODIUM SULPHITE	CAS: 7757-83-7 EC: 231-821-4	Not Available	>97%
SODIUM SULPHATE	CAS: 7757-82-6 EC: 231-820-9	Not Available	<2.5%
WATER	CAS: 7732-18-5 EC: 231-791-2	Not Available	<0.1%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Product Name **SODIUM SULPHITE**

Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). Urgent hospital treatment is likely to be needed. If swallowed, do not induce vomiting.
Advice to Doctor	Treat symptomatically.
First Aid Facilities	Eye wash facilities and safety shower are recommended.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases (sulphur oxides) when heated to decomposition.
Fire and Explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire.
Extinguishing	Use an extinguishing agent suitable for the surrounding fire.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills. Also store removed from air and moisture.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Sodium Carbonate (total dust)	SWA (AUS)	--	10	--	--

Biological Limits	No biological limit allocated.
Engineering Controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.
PPE	
Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Class P1 (Particulate) respirator. At high dust levels, wear a Full-face Class P3 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE CRYSTALLINE SOLID
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Product Name SODIUM SULPHITE

Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	9.0 to 10.5
Vapour density	NOT AVAILABLE
Specific gravity	2.6
Solubility (water)	SOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites) and acids (eg. nitric acid). Sensitive to air and moisture.
Hazardous Decomposition Products	May evolve toxic gases (sulphur oxides) when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low to moderate toxicity. This product has the potential to cause adverse health effects with over exposure. Use safe work practices to avoid eye or skin contact and inhalation. Some individuals are hypersensitive to sulphites and may experience respiratory problems following exposure. Individuals known to be hypersensitive or with existing respiratory problems (eg asthma) are advised to avoid exposure.																						
Eye	Low irritant. Contact may result in irritation, lacrimation, pain, redness, conjunctivitis and possible corneal damage.																						
Inhalation	Low irritant. Over exposure may result in mucous membrane irritation of the respiratory tract, with coughing. Some individuals are hypersensitive to sulphites, and may experience asthma like symptoms (wheezing and shortness of breath) immediately following exposure.																						
Skin	Low irritant. Contact may result in irritation, redness, rash and dermatitis.																						
Ingestion	Low to moderate toxicity. Ingestion may result in gastrointestinal irritation, nausea and vomiting. Well tolerated due to the oxidation of sulphites in the body to sulphates, however with large quantities sulphurous acid is formed. Some individuals may have an allergic reaction. The acute oral LD50 (male rat) is 3.56 g/kg/14 days.																						
Toxicity Data	<p>SODIUM CARBONATE (497-19-8)</p> <table><tr><td>LC50 (inhalation)</td><td>800 mg/m³/2 hours (guinea pig)</td></tr><tr><td>LD50 (ingestion)</td><td>4090 mg/kg (rat)</td></tr><tr><td>LD50 (intraperitoneal)</td><td>117 mg/kg (mouse)</td></tr><tr><td>LD50 (subcutaneous)</td><td>2210 mg/kg (mouse)</td></tr></table> <p>SODIUM SULPHITE (7757-83-7)</p> <table><tr><td>LD50 (ingestion)</td><td>820 mg/kg (mouse)</td></tr><tr><td>LD50 (intraperitoneal)</td><td>950 mg/kg (mouse)</td></tr><tr><td>LD50 (intravenous)</td><td>175 mg/kg (mouse)</td></tr><tr><td>LDLo (ingestion)</td><td>2825 mg/kg (rabbit)</td></tr><tr><td>LDLo (intravenous)</td><td>400 mg/kg (cat)</td></tr><tr><td>LDLo (subcutaneous)</td><td>600 mg/kg (rabbit)</td></tr></table> <p>SODIUM SULPHATE (7757-82-6)</p> <table><tr><td>LD50 (ingestion)</td><td>5989 mg/kg (mouse)</td></tr></table>	LC50 (inhalation)	800 mg/m ³ /2 hours (guinea pig)	LD50 (ingestion)	4090 mg/kg (rat)	LD50 (intraperitoneal)	117 mg/kg (mouse)	LD50 (subcutaneous)	2210 mg/kg (mouse)	LD50 (ingestion)	820 mg/kg (mouse)	LD50 (intraperitoneal)	950 mg/kg (mouse)	LD50 (intravenous)	175 mg/kg (mouse)	LDLo (ingestion)	2825 mg/kg (rabbit)	LDLo (intravenous)	400 mg/kg (cat)	LDLo (subcutaneous)	600 mg/kg (rabbit)	LD50 (ingestion)	5989 mg/kg (mouse)
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LDLo (subcutaneous)	600 mg/kg (rabbit)																						
LD50 (ingestion)	5989 mg/kg (mouse)																						

SODIUM SULPHATE (7757-82-6)

LD50 (intravenous)	1220 mg/kg (rabbit)
LDLo (intravenous)	1220 mg/kg (mouse)
TDLo (ingestion)	14 g/kg (mouse - 8-12 days pregnant)
TDLo (subcutaneous)	806 mg/kg/26 weeks intermittently (mouse)

12. ECOLOGICAL INFORMATION

Environment Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Cover spill with soda ash or sodium bicarbonate. Mix and spray with water, may be effervescent. Wait until reaction is complete, scoop into a large beaker and cautiously add equal volume of sodium hypochlorite (reaction may be vigorous). Add more water, stir and allow to stand (~1hr). Dilute and neutralise. Absorb with sand/similar dispose of to an approved landfill site, or alternatively (for small amounts) flush to sewer with large excess of water.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	None Allocated	None Allocated	None Allocated
Proper Shipping Name	None Allocated	None Allocated	None Allocated
DG Class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary Risk(s)	None Allocated	None Allocated	None Allocated
Packing Group	None Allocated	None Allocated	None Allocated
Hazchem Code	None Allocated		

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)

Inventory Listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional Information **RESPIRATORS:** In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

WORKPLACE CONTROLS AND PRACTICES: Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this ChemAlert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TLV	Threshold Limit Value
TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision History

Revision	Description
1.2	Standard SDS Review Standard SDS Review
1.1	Standard SDS Review
1.0	Initial SDS creation

Report Status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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Web: www.rmt.com.au

Revision: 1.2

SDS Date: 12 November 2012

End of SDS

MATERIAL SAFETY DATA SHEET

Product Name **SODIUM BICARBONATE (RHEOCHEM)****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>

Synonym(s) BAKING SODA • BICARBONATE OF SODA • CARBONIC ACID, MONOSODIUM SALT • MONOSODIUM CARBONATE • SODIUM ACID CARBONATE • SODIUM HYDROGEN CARBONATE

Use(s) PH CONTROL
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
SODIUM BICARBONATE	C-H-O3.Na	144-55-8	>99%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

Advice to Doctor Treat symptomatically.

First Aid Facilities Eye wash facilities and safety shower are recommended.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.

Fire and Explosion Treat as per requirements for Surrounding Fires: Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage If spilt (bulk), use personal protective equipment. Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from acids. Ensure packages are adequately labelled, protected from physical damage and sealed when not in use.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
SODIUM BICARBONATE (total dust)	SWA (AUS)	--	10 mg/m3	--	--

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE Personal Protective Equipment is not required under normal conditions of use. When using large quantities or where heavy contamination is likely, wear: dust-proof goggles and rubber or PVC gloves. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE POWDER	Solubility (water)	170 g/L @ 25°C
Odour	ODOURLESS	Specific Gravity	2.533
pH	8 (1% Solution)	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT RELEVANT
Melting Point	854°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Incompatible with acids (eg. nitric acid).

Hazardous Decomposition Products May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.

Hazardous Reactions

Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Low toxicity - low irritant. Use safe work practices to avoid eye or skin contact and inhalation.

Eye Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.

Inhalation Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.

Skin Low irritant. Prolonged or repeated contact may result in mild irritation.

Ingestion Low toxicity. Ingestion of large quantities may result in nausea, vomiting and gastrointestinal irritation. Sodium bicarbonate can neutralise the gastric juices in the stomach. During neutralisation, carbon dioxide gas is evolved and may cause stretching of the stomach, and with very large doses possible damage or rupture.

Toxicity Data SODIUM BICARBONATE (144-55-8)

Product Name SODIUM BICARBONATE (RHEOCHEM)

LD50 (Ingestion): 4220 mg/kg (rat)
TDLo (Ingestion): 1260 mg/kg (infant - lungs, kidney)

12. ECOLOGICAL INFORMATION

Environment This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Dispose of to an approved landfill site. Contact the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information ABBREVIATIONS:
ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indice(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m3 - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

Product Name **SODIUM BICARBONATE (RHEOCHEM)**

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

Product Name **SODA ASH (RHEOCHEM)****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) SODA ASH DENSE • SODIUM CARBONATE
Use(s) DRILLING AID
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R36 Irritating to eyes.

SAFETY PHRASES

S22 Do not breathe dust.

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated**Packing Group** None Allocated **Hazchem Code** None Allocated**3. COMPOSITION/ INFORMATION ON INGREDIENTS**

Ingredient	Formula	CAS No.	Content
SODIUM CARBONATE	Na ₂ -C-O ₃	497-19-8	>97%

4. FIRST AID MEASURES**Eye** If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.**Inhalation** If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.**Skin** If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.**Ingestion** For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.**Advice to Doctor** Treat symptomatically.**First Aid Facilities** Eye wash facilities should be available.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases (sodium oxides) when heated to decomposition.
Fire and Explosion	Treat as per requirements for Surrounding Fires: Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Prevent contamination of drains or waterways.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
Sodium Carbonate (total dust)	SWA (AUS)	--	10 mg/m3	--	--

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE Wear dust-proof goggles and PVC or rubber gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE POWDER	Solubility (water)	170 g/L
Odour	ODOURLESS	Specific Gravity	2.533
pH	NOT AVAILABLE	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT RELEVANT
Melting Point	854°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents and acids (eg. nitric acid).
Hazardous Decomposition Products	May evolve toxic gases (sodium oxides) when heated to decomposition.

Product Name **SODA ASH (RHEOCHEM)**

Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Slightly corrosive - irritant. This product has the potential to cause adverse health effects with over exposure. Use safe work practices to avoid eye or skin contact and inhalation.

Eye Slightly corrosive - irritant. Contact may result in irritation, lacrimation, pain, redness, conjunctivitis and possible burns.

Inhalation Slightly corrosive - irritant. Over exposure may result in irritation of the nose and throat, with coughing.

Skin Slightly corrosive. Contact may result in irritation, redness, pain, rash, dermatitis and possible burns.

Ingestion Slightly corrosive. Ingestion may result in burns to the mouth and throat, nausea, vomiting and abdominal pain. Ingestion is considered unlikely due to product form.

Toxicity Data SODIUM CARBONATE (497-19-8)
 LC50 (Inhalation): 800 mg/m³/2 hours (guinea pig)
 LD50 (Ingestion): 4090 mg/kg (rat)
 LD50 (Intraperitoneal): 117 mg/kg (mouse)
 LD50 (Subcutaneous): 2210 mg/kg (mouse)

12. ECOLOGICAL INFORMATION

Environment WATER: If released to waterways, alkaline products may change the pH of the waterway. Fish will die if the pH reaches 10-11 (goldfish 10.9, bluegill 10.5). SOIL: May leach to groundwater with toxic effects on aquatic life as above. ATMOSPHERE: Not expected to reside in the atmosphere. Drops or particles released to atmosphere should be removed by gravity and/or be rained out.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Neutralise with dilute acid (eg. 3 mol/L hydrochloric acid) or similar. For small amounts absorb with sand or similar and dispose of to an approved landfill site. Contact the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.

ADG - Australian Dangerous Goods.

BEI - Biological Exposure Indices(s).

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EC No - European Community Number.

HSNO - Hazardous Substances and New Organisms.

IARC - International Agency for Research on Cancer.

mg/m³ - Milligrams per Cubic Metre.

NOS - Not Otherwise Specified.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

Product Name **SODA ASH (RHEOCHEM)**

RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared By

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Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

Product Name **SAPP (RHEOCHEM)****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) DISODIUM DIHYDROGEN PYROPHOSPHATE • DISODIUM PYROPHOSPHATE
Use(s) ACIDIFIER • BUFFERING AGENT
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
DISODIUM PYROPHOSPHATE	H ₂ O ₇ -P ₂ .2Na	7758-16-9	100%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).

Advice to Doctor Treat symptomatically.

First Aid Facilities Eye wash facilities and safety shower should be available.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases (phosphorus oxides) when heated to decomposition. May evolve phosphorus oxides and/or phosphine when heated to decomposition.

Fire and Explosion Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage If spilt (bulk), use personal protective equipment. Ventilate area where possible. Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
Nuisance dust	SWA (AUS)	--	10 mg/m ³	--	--

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas.

PPE Wear dust-proof goggles and PVC or rubber gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE POWDER	Solubility (water)	119 g/L
Odour	SLIGHT ODOUR	Specific Gravity	1.35 - 1.41
pH	NOT AVAILABLE	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT RELEVANT
Melting Point	> 600°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Incompatible with oxidising agents and acids (eg. nitric acid).

Hazardous Decomposition Products May evolve toxic gases (phosphorus oxides) when heated to decomposition. May evolve phosphorus oxides and/or phosphine when heated to decomposition.

Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity. Use safe work practices to avoid eye or skin contact and inhalation.
Eye	Irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.
Skin	Low to moderate irritant. Prolonged or repeated contact may result in irritation and rash.
Ingestion	Low toxicity. Ingestion of large quantities may result in nausea, vomiting and gastrointestinal irritation. Ingestion of large quantities may also result in serious disturbances in calcium metabolism.
Toxicity Data	DISODIUM PYROPHOSPHATE (7758-16-9) LD50 (Ingestion): 2650 mg/kg (mouse) LD50 (Intraperitoneal): 1 g/kg (mouse) LD50 (Intravenous): 59 mg/kg (mouse) LD50 (Subcutaneous): 480 mg/kg (mouse)

12. ECOLOGICAL INFORMATION

Environment	Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Dispose of to an approved landfill site. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information	<p>ABBREVIATIONS:</p> <p>ACGIH - American Conference of Industrial Hygienists. ADG - Australian Dangerous Goods. BEI - Biological Exposure Indices(s). CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds. CNS - Central Nervous System. EC No - European Community Number. HSNO - Hazardous Substances and New Organisms. IARC - International Agency for Research on Cancer. mg/m³ - Milligrams per Cubic Metre. NOS - Not Otherwise Specified. pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline). ppm - Parts Per Million. RTECS - Registry of Toxic Effects of Chemical Substances. STEL - Short Term Exposure Limit. SWA - Safe Work Australia. TWA - Time Weighted Average.</p>
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HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Product Name **SAPP (RHEOCHEM)**

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

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SDS Date 01 Nov 2010

End of Report

SAFETY DATA SHEET

Product Name **SAND SEAL FINE**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier name **RHEOCHEM LTD**
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web site <http://www.rheochem.com.au/>
Synonym(s) SAND SEAL
Use(s) DRILLING FLUID ADDITIVE
SDS date 01 May 2013

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

None allocated

SAFETY PHRASES

None allocated

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN number	None Allocated	DG class	None Allocated
Packing group	None Allocated	Subsidiary risk(s)	None Allocated
Hazchem code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
VEGETABLE MATERIALS	Not Available	Not Available	100%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases if strongly heated.

Fire and explosion No fire or explosion hazard exists.

Product Name **SAND SEAL FINE**

Extinguishing Use an extinguishing agent suitable for the surrounding fire.

Hazchem code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Personal precautions Wear Personal Protective Equipment (PPE) as detailed in Section 8 of this SDS. Ventilate area where possible.

Environmental precautions Prevent product from entering drains and waterways.

Methods of cleaning up Contain spillage, then collect and place in suitable containers for disposal. Avoid generating dust.

References See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards No exposure standard(s) allocated.

Biological limits No biological limit allocated.

Engineering controls Avoid inhalation. Use in well ventilated areas. Maintain dust levels below the recommended exposure standard.

PPE

Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	At high dust levels, wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	TAN POWDER
Odour	MILD ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT AVAILABLE
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	6.3 (5% Suspension)
Vapour density	NOT AVAILABLE
Specific gravity	0.35
Solubility (water)	INSOLUBLE
Vapour pressure	1 mm Hg @ 20°C
Upper explosion limit	NOT AVAILABLE
Lower explosion limit	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE

Product Name **SAND SEAL FINE**

Partition coefficient NOT AVAILABLE
% Volatiles NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical stability Stable under recommended conditions of storage.
Conditions to avoid Avoid contact with incompatible substances.
Material to avoid Compatible with most commonly used materials.
Hazardous Decomposition Products May evolve toxic gases if heated to decomposition.
Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Low toxicity. Under normal conditions of use, adverse health effects are not anticipated. This product is generally considered to be of low toxicity. Use safe work practices to avoid eye contact, prolonged skin contact and dust generation - inhalation.
Eye Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.
Skin Low irritant. Prolonged or repeated exposure to dust may result in irritation and dermatitis.
Ingestion Low toxicity. Ingestion from hand to mouth contamination may result in gastrointestinal irritation and nausea.
Toxicity data No LD50 data available for this product.

12. ECOLOGICAL INFORMATION

Toxicity No information provided.
Persistence and degradability No information provided.
Bioaccumulative potential No information provided.
Mobility in soil No information provided.
Other adverse effects This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Waste disposal Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer if additional information is required.
Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN number	None Allocated	None Allocated	None Allocated
Proper shipping name	None Allocated	None Allocated	None Allocated
DG class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
Packing group	None Allocated	None Allocated	None Allocated
Hazchem code	None Allocated		

15. REGULATORY INFORMATION

Poison schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
Inventory Listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TLV	Threshold Limit Value
TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision history

Revision	Description
2.3	Standard SDS Review
2.2	Standard SDS Review
2.1	Standard SDS Review
2.0	Standard SDS Review
1.1	Standard SDS Review.
1.0	Initial SDS creation

Product Name **SAND SEAL FINE**

Report status This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

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Phone: +61 8 9322 1711
Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmt.com.au

Revision: 2.3
SDS Date: 01 May 2013

End of SDS

Product Name **SALT****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) FLOSSY SALT • HALITE • NACL • SALT • SODIUM CHLORIDE
Use(s) CHLORIDE SOURCE • DRILLING FLUID ADDITIVE
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
SODIUM CHLORIDE	Na-Cl	7647-14-5	>98%
INORGANIC SALTS	Not Available	Not Available	<0.8%
WATER	H2O	7732-18-5	<0.8%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation Due to product form / nature of use, an inhalation hazard is not anticipated.

Skin Exposure is considered unlikely. Skin irritation is not anticipated.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Non flammable.

Fire and Explosion No fire or explosion hazard exists.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

Product Name **SALT**

6. ACCIDENTAL RELEASE MEASURES

Spillage If spilt/ packages damaged, collect for later disposal or reuse.

7. STORAGE AND HANDLING

Storage Store in a cool, dry, well ventilated area, removed from oxidising agents, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds No exposure standard(s) allocated.

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas.

PPE Personal Protective Equipment is not required under normal conditions of use. When using large quantities or where heavy contamination is likely, wear: dust-proof goggles and rubber or PVC gloves. At high dust levels, wear: a Class P1 (Particulate) respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	TRANSLUCENT TO WHITE GRANULES OR POWDER	Solubility (water)	357 g/L
Odour	SLIGHT ODOUR	Specific Gravity	2.163
pH	7 (1% Solution)	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	1413°C	Upper Explosion Limit	NOT RELEVANT
Melting Point	801°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Incompatible with oxidising agents (eg. hypochlorites). Avoid contact with strong oxidising agents, bromium trifluoride, lithium and acids.

Hazardous Decomposition Products May evolve toxic gases if heated to decomposition.

Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Non toxic. Under normal conditions of use, adverse health effects are not anticipated. This product is used in trace amounts as a food additive, however the concentrated product is not suitable for ingestion.

Eye Low irritant. Contact may result in irritation, lacrimation and redness.

Inhalation Low irritant. Over exposure to dust may result in irritation of the nose and throat, coughing, nausea and headache.

Skin Low irritant. Prolonged or repeated contact may result in mild irritation.

Ingestion Non toxic when used as a food additive. However, the concentrate should not be consumed undiluted. Ingestion may result in gastrointestinal irritation, nausea and vomiting.

Toxicity Data SODIUM CHLORIDE (7647-14-5)
LC50 (Inhalation): > 42000 mg/m³/1 hour (rat)
LD50 (Ingestion): 3000 mg/kg (rat)
LD50 (Intraperitoneal): 2602 mg/kg (mouse)

Product Name SALT

LD50 (Intravenous): 645 mg/kg (mouse)
LD50 (Skin): > 10000 mg/kg (rabbit)
LD50 (Subcutaneous): 3000 mg/kg (mouse)
LDLo (Ingestion): 8000 mg/kg (rabbit)
LDLo (Intravenous): 300 mg/kg (guinea pig)
LDLo (Subcutaneous): 2160 mg/kg (guinea pig)
TDLo (Ingestion): 12357 mg/kg (human)

12. ECOLOGICAL INFORMATION

Environment This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Waste Disposal No special precautions are required for the disposal of this product.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name None Allocated

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated

Packing Group None Allocated **Hazchem Code** None Allocated

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information ABBREVIATIONS:
ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indices(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m³ - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

Product Name **SALT**

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Western Australia 6005
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Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

MATERIAL SAFETY DATA SHEET

Product Name **RHEOPAC R/LV/UL/RD/LVD****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) RHEOPAC LV • RHEOPAC R • RHEOPAC UL
Use(s) DRILLING FLUID ADDITIVE
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
SODIUM CARBOXYMETHYL CELLULOSE	C28-H30-O27.Na8	9004-32-4	98%
WATER	H2O	7732-18-5	10%
SODIUM CHLORIDE	Na-Cl	7647-14-5	1.4%
SODIUM GLYCOLATE	C2-H3-O3.Na	2836-32-0	0.7%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting. Ingestion is considered unlikely due to product form.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability	Combustible. May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition. Finely divided dust may form explosive mixtures with air.
Fire and Explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds	No exposure standard(s) allocated.
Biological Limits	No biological limit allocated.
Engineering Controls	Avoid inhalation. Use in well ventilated areas. Maintain dust levels below the recommended exposure standard.
PPE	Wear dust-proof goggles and PVC or rubber gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. Where an inhalation risk exists, wear: a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	WHITE OR YELLOWISH POWDER/GRANULES	Solubility (water)	SOLUBLE
Odour	SLIGHT ODOUR	Specific Gravity	NOT AVAILABLE
pH	6.0 - 8.5 (1 % solution)	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	COMBUSTIBLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT AVAILABLE
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT AVAILABLE
Melting Point	NOT AVAILABLE	Lower Explosion Limit	NOT AVAILABLE
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents and acids (eg. nitric acid).
Hazardous Decomposition Products	May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low toxicity. Under normal conditions of use, adverse health effects are not anticipated. This product is generally considered to be of low toxicity. Use safe work practices to avoid eye contact, prolonged skin contact and dust generation - inhalation.
Eye	Low to moderate irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Low irritant. Over exposure may result in irritation of the nose and throat, with coughing.
Skin	Low irritant. Prolonged or repeated contact may result in mild irritation.
Ingestion	Low toxicity. Ingestion may result in gastrointestinal irritation. However, due to product form ingestion is considered unlikely. Maintain good personal hygiene standards.
Toxicity Data	SODIUM CARBOXYMETHYL CELLULOSE (9004-32-4) LD50 (Ingestion): 16000 mg/kg (guinea pig) LD50 (Skin): > 2000 mg/kg (rabbit) TDLo (Ingestion): 140 mg/kg (rat) SODIUM CHLORIDE (7647-14-5) LC50 (Inhalation): > 42000 mg/m ³ /1 hour (rat) LD50 (Ingestion): 3000 mg/kg (rat) LD50 (Intraperitoneal): 2602 mg/kg (mouse) LD50 (Intravenous): 645 mg/kg (mouse) LD50 (Skin): > 10000 mg/kg (rabbit) LD50 (Subcutaneous): 3000 mg/kg (mouse) LDLo (Ingestion): 8000 mg/kg (rabbit) LDLo (Intravenous): 300 mg/kg (guinea pig) LDLo (Subcutaneous): 2160 mg/kg (guinea pig) TDLo (Ingestion): 12357 mg/kg (human) SODIUM GLYCOLATE (2836-32-0) LD50 (Ingestion): 6700 mg/kg (mouse) LDLo (Ingestion): 500 mg/kg (cat)

12. ECOLOGICAL INFORMATION

Environment	This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. Not expected to bioaccumulate.
Ecotoxicity	Aquatic toxicity: LC50 (Fresh Water Trout) > 21,000 ppm/96hrs. LC50 (Salt Water Stickel Back) > 56,000 ppm/96hrs.

13. DISPOSAL CONSIDERATIONS

Waste Disposal	Ensure product is covered with moist soil to prevent dust generation and dispose of to approved Council landfill. Contact the manufacturer if additional information is required.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information	RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.
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ABBREVIATIONS:

Product Name RHEOPAC R/LV/UL/RD/LVD

ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indice(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m3 - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

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Email: info@rmt.com.au
Web: www.rmt.com.au

SDS Date 01 Nov 2010

End of Report

SAFETY DATA SHEETProduct Name **RHEOBEN****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, 6166, AUSTRALIA
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web site <http://www.rheochem.com.au/>
Synonym(s) API BENTONITE (SECTION 9), GEL, BENTONITE
Use(s) DRILLING FLUID
SDS date 05 June 2013

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

SAFETY PHRASES

S22 Do not breathe dust.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN number	None Allocated	DG class	None Allocated
Packing group	None Allocated	Subsidiary risk(s)	None Allocated
Hazchem code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
QUARTZ (SILICA CRYSTALLINE)	CAS: 14808-60-7 EC: 238-878-4	Not Available	2 to 10%
BENTONITE	CAS: 1302-78-9 EC: 215-108-5	Not Available	90 to 98%
SODA ASH	Not Available	Not Available	2 to 4%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). Due to product form and application, ingestion is considered unlikely.

Advice to doctor Treat symptomatically.

First aid facilities Eye wash facilities and safety shower should be available.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases if strongly heated.
Fire and explosion	Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Use an extinguishing agent suitable for the surrounding fire.
Hazchem code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear Personal Protective Equipment (PPE) as detailed in Section 8 of this SDS.
Environmental precautions	Prevent product from entering drains and waterways.
Methods of cleaning up	Moisten with water to prevent a dust hazard and place in sealable containers for disposal.
References	See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from hydrofluoric acid, strong alkalis and foodstuffs. Store in a cool, dry, well ventilated place, removed from direct sunlight, oxidising agents (eg. hypochlorites), acids, water and foodstuffs. Storage area floors may become slippery if wetted. Ensure packaging are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Silica, Crystalline Quartz	SWA (AUS)	--	0.1	--	--

Biological limits	No Biological Limit Value allocated.
Engineering controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.
PPE	
Eye / Face	Wear dust-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Wear a Class P1 (Particulate) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	BROWN POWDER
Odour	SLIGHT ODOUR
Flammability	NON FLAMMABLE

Product Name RHEOBEN

Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	1100°C to 1200°C (Fusion Point)
Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT AVAILABLE
Specific gravity	2.7
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical stability	Stable under recommended conditions of storage.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to avoid	Incompatible with acids (eg. nitric acid) and alkalis (eg. hydroxides).
Hazardous Decomposition Products	May evolve toxic gases if heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Irritant - high chronic toxicity. Use safe work practices to minimise dust generation (ie. moisten) and eye or skin contact. Chronic exposure to crystalline silica may result in lung fibrosis (silicosis). Crystalline silica is classified as carcinogenic to humans (IARC Group 1).
Eye	Irritant. Contact may result in irritation, lacrimation, pain and redness.
Inhalation	Irritant. Over exposure may result in irritation of the nose and throat, with coughing. Chronic exposure to respirable silica may result in pulmonary fibrosis (silicosis). Crystalline silica is classified as carcinogenic to humans (IARC Group 1).
Skin	Low to moderate irritant. Prolonged or repeated contact may result in irritation, rash and dermatitis.
Ingestion	Low toxicity. Ingestion of large quantities may result in nausea, vomiting and gastrointestinal irritation.
Toxicity data	QUARTZ (SILICA CRYSTALLINE) (14808-60-7) LCLo (inhalation) 300 ug/m ³ /10 years (human) TCLo (inhalation) 16 000 000 particles/ft ³ /8 hours/17.9 years (human-fibrosis) BENTONITE (1302-78-9) LD50 (intravenous) 35 mg/kg (rat) LDLo (intravenous) 10 mg/kg (dog)

12. ECOLOGICAL INFORMATION

Toxicity	No information provided.
Persistence and degradability	No information provided.
Bioaccumulative potential	No information provided.
Mobility in soil	No information provided.
Other adverse effects	The main component/s of this product are not anticipated to cause any adverse effects to plants or animals.

13. DISPOSAL CONSIDERATIONS

Product Name RHEOBEN

Waste disposal Reuse where possible. No special precautions are required for this product.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN number	None Allocated	None Allocated	None Allocated
Proper shipping name	None Allocated	None Allocated	None Allocated
DG class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
Packing group	None Allocated	None Allocated	None Allocated
Hazchem code	None Allocated		

15. REGULATORY INFORMATION

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Inventory Listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGES: Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Product Name RHEOBEN

Abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists
	CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
	CNS	Central Nervous System
	EC No.	EC No - European Community Number
	GHS	Globally Harmonized System
	IARC	International Agency for Research on Cancer
	LD50	Lethal Dose, 50% / Median Lethal Dose
	mg/m ³	Milligrams per Cubic Metre
	PEL	Permissible Exposure Limit
	pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
	ppm	Parts Per Million
	REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
	STOT-RE	Specific target organ toxicity (repeated exposure)
	STOT-SE	Specific target organ toxicity (single exposure)
	SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
	TLV	Threshold Limit Value
	TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision history

Revision	Description
1.1	Standard SDS Review
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

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Prepared by

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Email: info@rmt.com.au
Web: www.rmt.com.au.

Revision: 1.1
SDS Date: 05 June 2013

End of SDS

**Attachment 3b
Cementing MSDSs**

MATERIAL SAFETY DATA SHEET

Product Trade Name: GASCON 469

Revision Date: 26-Mar-2014

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: GASCON 469
Synonyms: None
Chemical Family: Blend
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Cement Additive

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. HAZARDS IDENTIFICATION

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Hazard Overview May cause mild eye irritation. May cause mild skin irritation.

Classification None

Risk Phrases None

Safety Phrases S24/25 Avoid contact with skin and eyes.

HSNO Classification 6.3B Mildly irritating to the skin

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT (w/w)	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Contains no hazardous substances	Mixture	60 - 100%	Not applicable	Not applicable	Not applicable

Non-Hazardous Substance to Total of 100%

4. FIRST AID MEASURES

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

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

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media
All standard fire fighting media

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

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors.
Storage Information	Store in a cool well ventilated area. Keep from excessive heat. Keep from freezing. Keep container closed when not in use. Store in non-rusting containers. Product has a shelf life of 12 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.
Respiratory Protection	Dust/mist respirator. (N95, P2/P3)
Hand Protection	Impervious rubber gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Transparent
Odor:	Odorless
pH:	10
Specific Gravity @ 20 C (Water=1):	1.1
Density @ 20 C (kg/l):	1.098
Bulk Density @ 20 C (kg/M3):	Not Determined
Boiling Point/Range (C):	100
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	80
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	10
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
------------------------	--------

Hazardous Polymerization: Will Not Occur

Conditions to Avoid None anticipated

Incompatibility (Materials to Avoid) Strong oxidizers. Strong acids.

Hazardous Decomposition Products None known.

Additional Guidelines Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure

Acute Toxicity

Inhalation May cause mild respiratory irritation.

Eye Contact May cause mild eye irritation.

Skin Contact May cause mild skin irritation.

Ingestion Irritation of the mouth, throat, and stomach.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 1% are chronic health hazards.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Contains no hazardous substances	Mixture	No data available	No data available	No data available

12. ECOLOGICAL INFORMATION

Ecotoxicological Information

Ecotoxicity Product

Acute Fish Toxicity: Not determined

Acute Crustaceans Toxicity: Not determined

Acute Algae Toxicity: Not determined

Ecotoxicity Substance

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Contains no hazardous substances	Mixture	No information available	No information available	No information available	No information available

12.2 Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Does not bioaccumulate

12.4 Mobility in soil

No information available

12.5 Results of PBT and vPvB assessment

No information available.

12.6 Other adverse effects

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations. Incineration recommended in approved incinerator according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.
Contaminated Packaging	Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	All components listed on inventory or are exempt.
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS
Classification	Not Classified
Risk Phrases	Not classified

Safety Phrases
S24/25 Avoid contact with skin and eyes.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS

Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: ECONOLITE LIQUID

Revision Date: 17-Jan-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substance or Preparation

Product Trade Name: ECONOLITE LIQUID
Synonyms: None
Chemical Family: Silicate
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: S5
Application: Light Weight Cement Additive

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance	CAS Number	Percent	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Sodium silicate	1344-09-8	35-49	Not determined	Not determined	Not applicable

Non-hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview	May cause eye and skin burns. May cause respiratory irritation. May be harmful if swallowed.
Risk Phrases	R34 Causes burns.
HSNO Classification	Not Determined

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.
Eyes	In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.
Ingestion	Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.
Notes to Physician	Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Water fog, carbon dioxide, foam, dry chemical.
Unsuitable Extinguishing Media	None known
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use Appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways or low areas.
Procedure for Cleaning/Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralise to pH of 6-8. Scoop up and remove. Do NOT spread spilled product with water.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapours. Wash hands after use. Launder contaminated clothing before reuse. Avoid breathing mist.
Storage Information	Store away from acids. Store in a cool well ventilated area. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.
Respiratory Protection	Dust/mist respirator. (N95,P2/P3)
Hand Protection	Impervious rubber gloves.
Skin Protection	Full protective clothing.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Colour:	Clear to hazy
Odour:	Slightly soapy
pH:	11.2
Specific Gravity @ 20 C (Water=1):	1.4
Density @ 20 C (kg/l):	1.4
Bulk Density @ 20 C (kg/l):	Not Determined
Boiling Point/Range (C):	101
Freezing Point/Range (C):	-1
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapour Pressure @ 20 C (mmHg):	Not Determined
Vapour Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate = 1):	Not determined.
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerisation:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong acids. Amphoteric metals such as aluminium, magnesium, lead, tin, or zinc.

Hazardous Decomposition Products	Toxic fumes.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
<u>Symptoms related to exposure</u>	
Inhalation	Causes severe respiratory irritation.
Skin Contact	May cause skin burns.
Eye Contact	May cause eye burns.
Ingestion	Causes burns of the mouth, throat and stomach.
Aggravated Medical Conditions	Skin disorders.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	LD50: 2000-3000 mg/kg (Rat)
Dermal Toxicity:	Not determined.
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity:	Not determined
Genotoxicity:	Not determined
Reproductive/Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Disposal should be made in accordance with federal, state and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed.
New Zealand Inventory of Chemicals All components listed on inventory or are exempt.
US TSCA Inventory All components listed.
EINECS Inventory All components are listed on the inventory.

Classification C - Corrosive.

Risk Phrases R34 Causes burns.

Safety Phrases S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36 Wear suitable protective clothing.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS:
Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: CEMENT - CLASS G + 35% SSA-1

Revision Date: 29-Apr-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING
--

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substance or Preparation

Product Trade Name: CEMENT - CLASS G + 35% SSA-1
Synonyms: None
Chemical Family: Cement
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Cement

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS
--

Substance	CAS Number	Percent	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Portland cement	65997-15-1	60 - 100%	TWA: 10 mg/m ³	TWA: 10 mg/m ³	TWA: 1 mg/m ³
Crystalline silica, quartz	14808-60-7	30 - 60%	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.025 mg/m ³

Non-hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD

May cause eye, skin and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

Risk Phrases

R41 Risk of serious damage to eyes.

R43 May cause sensitisation by skin contact.

R49 May cause cancer by inhalation.

R37/38 Irritating to respiratory system and skin.

R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

HSNO Classification

Not Determined

4. FIRST AID MEASURES

Inhalation

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

Skin

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

Eyes

In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion

Under normal conditions, first aid procedures are not required.

Notes to Physician

Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

None - does not burn.

Unsuitable Extinguishing Media

None known

Special Exposure Hazards

Not applicable.

Special Protective Equipment for Fire-Fighters

Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use Appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures None known.

Procedure for Cleaning/Absorption Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing. This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.

Storage Information Store in a cool, dry location. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Product has a shelf life of 24 months

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.

Respiratory Protection Wear a NIOSH certified, European Standard EN 149 (FFP2/FFP3), or equivalent respirator when using this product.

Hand Protection Normal work gloves.

Skin Protection Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection Wear safety glasses or goggles to protect against exposure.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Colour:	Grey
Odour:	Odourless
pH:	12.4
Specific Gravity @ 20 C (Water=1):	Not Determined
Density @ 20 C (kg/l):	Not Determined
Bulk Density @ 20 C (kg/l):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapour Pressure @ 20 C (mmHg):	Not Determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapour Density (Air=1):	Not Determined
Percent Volatiles:	0
Evaporation Rate (Butyl Acetate = 1):	Not determined.
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerisation:	Will Not Occur
Conditions to Avoid	Keep away from any contact with water.
Incompatibility (Materials to Avoid)	Hydrofluoric acid
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure **Inhalation**

Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See Chronic Effects/Carcinogenicity" subsection below).

"

Skin Contact Can dry skin. May cause an allergic skin reaction. May cause alkali burns with confined contact.

Eye Contact May cause severe eye irritation.

Ingestion None known

Aggravated Medical Conditions Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects/Carcinogenicity Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

" There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997)."

Toxicity Tests

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined.
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity:	Refer to <u>IARC Monograph 68, Silica, Some Silicates and Organic Fibres</u> (June 1997).
Genotoxicity:	Not determined
Reproductive/Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not applicable
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed.
New Zealand Inventory of Chemicals All components listed on inventory or are exempt.
US TSCA Inventory All components listed.
EINECS Inventory All components are listed on the inventory.

Classification
T - Toxic.
Xi - Irritant.

Risk Phrases
R41 Risk of serious damage to eyes.
R43 May cause sensitisation by skin contact.
R49 May cause cancer by inhalation.
R37/38 Irritating to respiratory system and skin.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Safety Phrases
S2 Keep out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37 Wear suitable gloves.
S24/25 Avoid contact with skin and eyes.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS:

Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: **CFR-3L**

Revision Date: 22-Feb-2012

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: CFR-3L
Synonyms: None
Chemical Family: Blend
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Friction Reducer

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Sulfonic acid salt		30 - 60%	Not applicable	Not applicable	Not applicable

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye and skin irritation.

Risk Phrases None

HSNO Classification Non-hazardous

4. FIRST AID MEASURES

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

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

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media Water fog, carbon dioxide, foam, dry chemical.

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

Special Exposure Hazards Decomposition in fire may produce toxic gases.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing.

Storage Information Store away from oxidizers. Store in a cool well ventilated area. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use in a well ventilated area.

Respiratory Protection	Dust/mist respirator. (N95, P2/P3)
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Red
Odor:	Musty
pH:	7
Specific Gravity @ 20 C (Water=1):	1.17
Density @ 20 C (kg/l):	1.17
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined Min: > 98
Flash Point Method:	PMCC
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	67
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Oxides of sulfur. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	None known.
Skin Contact	May cause skin irritation.
Eye Contact	May cause mild eye irritation.
Ingestion	None known
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	LD50: 8670 mg/kg (Rat)
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	This product does not comply with NZIOC
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS

Classification Not Classified

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS

Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: **BARITE**

Revision Date: 03-Aug-2012

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
53-55 Bannister Road
Canning Vale
WA 6155
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: BARITE
Synonyms: None
Chemical Family: Mineral
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Weight Additive

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Barium sulfate	7727-43-7	60 - 100%	10 mg/m ³	10 mg/m ³	10 mg/m ³
Crystalline silica, quartz	14808-60-7	1 - 5%	0.1 mg/m ³	0.2 mg/m ³	0.025 mg/m ³

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD

May cause eye, skin, and respiratory irritation. May be harmful if swallowed.

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

Risk Phrases

None

HSNO Classification

6.7A Substances that are known or presumed human carcinogens.
6.9A Substances that are toxic to human target organs or systems.

4. FIRST AID MEASURES

Inhalation

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

Skin

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

Eyes

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion

Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician

Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

All standard fire fighting media

Extinguishing media which must not be used for safety reasons

None known.

Special Exposure Hazards

Not applicable.

Special Protective Equipment for Fire-Fighters

Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures

Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures

None known.

Procedure for Cleaning / Absorption

Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.

Storage Information

Store in a cool, dry location. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.

Personal Protective Equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product.

Hand Protection

Normal work gloves.

Skin Protection

Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection

Wear safety glasses or goggles to protect against exposure.

Other Precautions

None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Pink to tan to gray
Odor:	Odorless
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	4.23
Density @ 20 C (kg/l):	Not Determined
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	> 100
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	233.4
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	None known.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	<p>Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).</p> <p>Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).</p>
Skin Contact	None known.
Eye Contact	May cause mild eye irritation.
Ingestion	May produce nervous system effects such as feeling of weakness, unsteady walk, and dilation of blood vessels. May affect the heart and cardiovascular system.
Aggravated Medical Conditions	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects/Carcinogenicity Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Prolonged inhalation of fine barium sulfate dusts form harmless nodular granules in lung, an affliction called baritosis. Baritosis produces no symptoms of bronchitis or emphysema, and lung functioning is not affected although dyspnea, upon exertion, may occur. The nodulation disappears if exposure is stopped.

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity:	LD50: >15000 mg/kg (Rat)
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Refer to <u>IARC Monograph 68, Silica, Some Silicates and Organic Fibres</u> (June 1997).
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not applicable
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 7500 ppm (Oncorhynchus mykiss)
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals All components listed on inventory or are exempt.
US TSCA Inventory All components listed on inventory or are exempt.
EINECS Inventory This product, and all its components, complies with EINECS

Classification Crystalline silica is not classified as a carcinogen in EU Council Directives 67/548/EEC and 88/379/EEC.

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS

Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

END OF MSDS



Adelaide Brighton Cement Ltd
Product Name

AUSTWELL CLASS G (HSR) CEMENT

Safety Data Sheet



API Licence No.
10A - 00043

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name	AUSTWELL CLASS G (HSR) CEMENT
Supplier Name	ADELAIDE BRIGHTON CEMENT LTD ABN 96 007 870 199
Address	62 Elder Road, Birkenhead, SA 5015
Manufacturing Plant(s)	Angaston Works, Stockwell Road, Angaston, SA 5353
Telephone	08 8300 0300
Fax	08 8341 1591
Emergency	Bus Hrs 08 8300 0300 A/Hrs 08 8300 0530
Email	customerservice@adbri.com.au
Web Site	www.adelaidebrighton.com.au
Synonym(s)	CLASS G, OILWELL CEMENT.
Use(s)	Austwell Class G (HSR) Cement is a special purpose cement for the oil and gas exploration industry.

2. HAZARDS IDENTIFICATION

This product is classified as hazardous according to criteria of NOHSC.
Not classified as a dangerous good by the criteria of the ADG Code.

RISK PHRASES

R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of a carcinogenic effect.
R43	May cause sensitisation by skin contact.
R48/20	Harmful : danger of serious damage to health by prolonged exposure through inhalation.

SAFETY PHRASES

S20/21	When using do not eat, drink or smoke.
S22	Do not breathe dust.
S24/25	Avoid contact with skin and eyes.
S36/37	Wear suitable protective clothing and gloves.
S38	In case of insufficient ventilation, wear suitable respiratory equipment.

UN No	None Allocated	Hazchem Code	None Allocated	Pkg Group	None Allocated
DG Class	None Allocated	Subsidiary Risk(s)	None Allocated	EPG	None Allocated

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Formula	Conc.	CAS No.
PORTLAND CEMENT	Not Available	< 97%	65997-15-1
*GYPSUM	CaSO ₄ 2H ₂ O	3 - 8%	10101-41-4
*LIMESTONE	CaCO ₃	0 - 5%	1317-65-3
CHROMIUM (VI)	Cr ⁶⁺	< 10 ppm	18540-29-9

*NOTE: Cements may contain 0.1%-35% crystalline silica (CAS No. 14808-60-7) depending on the proportions and crystalline silica content of the ingredients. All ingredients may contain crystalline silica.



Product Name

AUSTWELL CLASS G (HSR) CEMENT

Safety Data Sheet



API Licence No.
10A - 00043

4. FIRST AID MEASURES

Eye	Flush thoroughly with flowing water for at least 15 minutes. Seek medical attention if symptoms persist.
Inhalation	Remove from dusty area to fresh air. If symptoms persist, seek medical attention.
Skin	Wash thoroughly with water. A shower may be required.
Ingestion	Rinse mouth and lips with water. Do not induce vomiting. Give water to drink to dilute stomach contents. If symptoms persist, seek medical attention.
Advice to Doctor	Treat symptomatically.
First Aid Facilities	Eye wash station.

Additional Information - Aggravated Medical Conditions

Inhalation	Inhalation of dust through prolonged, repeated exposure can cause bronchitis, silicosis (scarring of the lung.) It may also increase the risk of scleroderma (a disease affecting the connective tissue of the skin, joints, blood vessels and internal organs) and lung cancer. Epidemiological studies have shown that smoking increases the risk of bronchitis, silicosis (scarring of the lung) and lung cancer.
Skin	Prolonged and repeated skin contact with cement in wet concrete, mortars and slurries may cause both irritant dermatitis and allergic (contact) dermatitis. The latter is due to the presence of traces of water soluble hexavalent chromium in cement.

5. FIRE FIGHTING

Flammability	Non flammable. Does not support combustion of other materials.
Fire and Explosion	Non flammable. Does not cause dust explosions.
Extinguishing	Non flammable.
Hazchem Code	None.

6. ACCIDENTAL RELEASE MEASURES

Spillage	If spilt (bulk), contact emergency services if appropriate. Wear dust-proof goggles, PVC/rubber gloves, a Class P2 respirator (where an inhalation risk exists), coveralls and rubber boots. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Collect and place in sealable containers for disposal or reuse. Avoid generating dust.
Emergency Procedures	Follow safety requirements for personal protection under Section 8 Exposure Controls/Personal Protection.

7. HANDLING AND STORAGE

Storage	Store in cool, dry, well ventilated area, removed from moisture, oxidising agents (eg. Hypochlorites, phosphorus oxide), acids, (eg hydrochloric acid), ethanol, interhalogens (eg. chlorine trifluoride) and foodstuffs. Ensure packages are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.
Property/ Environmental	Refer to Section 13.



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Do not inhale dust/powder. Use with adequate ventilation. Where a dust inhalation hazard exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

Exposure Standards

CALCIUM HYDROXIDE (1305-62-0)
 ES-TWA: 5 mg/m³
 WES-TWA: 5 mg/m³

CHROMIUM (VI) (18540-29-9)
 ES-TWA: 0.05 mg/m³ (Chromium VI compounds)

SILICA, CRYSTALLINE – QUARTZ (14808-60-7)
 ES-TWA: 0.1 mg/m³ (Silica Quartz, respirable, NOHSC)
 ES-TWA: 0.1 mg/m³ (QLD); 0.15 mg/m³ (NSW)
 WES-TWA: 0.1 mg/m³

PORTLAND CEMENT (65997-15-1)
 ES-TWA: 10 mg/m³ Portland Cement
 ES-TWA: 0.05 mg/m³ Chromium (VI) Compounds (contaminant)
 WES-TWA: 10 mg/m³

SILICA, AMORPHOUS – FUME (69012-64-2)
 ES-TWA: 2 mg/m³ Silica fume (thermally generated) (respirable)

GYP SUM (10101-41-4)
 ES-TWA: 10 mg/m³ Inhalable dust

CALCIUM CARBONATE (1317-65-3)
 ES-TWA: 10 mg/m³
 WES-TWA: 10 mg/m³

FLYASH (68131-74-8)
 ES-TWA: 10 mg/m³

PPE Wear dust-proof goggles and rubber or PVC gloves. Where an inhalation risk exists, wear a Class P2 respirator. If there is potential for prolonged and/or excessive skin contact, wear coveralls. At high dust levels, wear a Class P3 respirator or a Powered Air Purifying Respirator (PAPR) with Class P3 filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Fine powder ranging in colour from grey to off-white	Solubility (water)	Slight, hardens on mixing with water
Odour	Odourless	Specific Gravity	2.5 to 3.2
pH	Approximately 12	% Volatiles	Not Available
Vapour Pressure	Not Available	Flammability	Non Flammable
Vapour Density	Not Available	Flash Point	Not Relevant
Boiling Point	Not Available	Upper Explosion Limit	Not Relevant
Melting Point	> 1200°C	Lower Explosion Limit	Not Relevant
Evaporation Rate	Not Available	Autoignition Temperature	Not Available
Bulk Density	1200 - 1600 kg/m ³		
Particle Size	20 - 40% of particles are < 7 µm, ie in the respirable range		

10. STABILITY AND REACTIVITY

Reactivity Incompatible with oxidising agents (eg hypochlorites), ethanol, acids (eg hydrofluoric acid) and interhalogens (eg chlorine trifluoride). Water contact may increase product temperature 2-3°C.

Decomposition Products Unlikely to evolve toxic gases when heated to decomposition.



Product Name

AUSTWELL CLASS G (HSR) CEMENT

Safety Data Sheet



11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Slightly corrosive. Avoid eye or skin contact or dust inhalation. This product has the potential to cause acute and chronic health effects with over exposure. Crystalline silica can cause silicosis (lung disease) with chronic over exposure, however due to low levels present and product application, adverse health effects are not anticipated. Crystalline silica and hexavalent chromium compounds are classified as carcinogenic to humans (IARC Group 1).
Eye	Corrosive. Severe irritant upon contact with powder/dust. Over exposure may result in pain, redness, corneal burns and ulceration with possible permanent damage.
Inhalation	Slightly corrosive. Over exposure may result in severe mucous membrane irritation and bronchitis. Hexavalent chromium is reported to cause respiratory sensitisation, however due to the trace amount present, a hazard is not anticipated under normal conditions of use.
Skin	Slightly corrosive. Prolonged and repeated contact with powder or wetted form may result in skin rash, dermatitis and sensitisation.
Ingestion	Slightly corrosive. Ingestion may result in burns to the mouth and throat, with vomiting and abdominal pain. Due to product form, ingestion is not considered a likely exposure route.
Toxicity Data	SILICA, CRYSTALLINE - QUARTZ (14808-60-7) Carcinogenicity: Classified as a human carcinogen (IARC Group 1) CHROMIUM (VI) (18540-29-9) Carcinogenicity: Confirmed human carcinogen (IARC Group 1) Health Surveillance: Required [NOHSC:1005(1994)]

12. ECOLOGICAL INFORMATION

Environment	Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal	Reuse or recycle where possible. Alternatively, ensure product is covered with moist soil to prevent dust generation and dispose of to an approved landfill site. Contact the manufacturer for additional information.
Legislation	Dispose of in accordance with relevant local legislation. Keep out of sewer and stormwater drains.

14. TRANSPORT INFORMATION

Not classified as a dangerous good by the criteria of the ADG Code.

Drivers of trucks transporting bagged product should ensure that the bags are properly restrained.

Shipping Name	None Allocated	Hazchem Code	None Allocated	Pkg Group	None Allocated
UN No	None Allocated	Subsidiary Risk(s)	None Allocated	EPG	None Allocated
DG Class	None Allocated				

15. REGULATORY INFORMATION

Poison Schedule AICS	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). All chemicals listed on the Australian Inventory of Chemical Substances (AICS).
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Product Name

AUSTWELL CLASS G (HSR) CEMENT

Safety Data Sheet



16. OTHER INFORMATION

Additional Information

CEMENT CONTACT DERMATITIS: Individuals using wet cement, mortar, grout or concrete could be at risk of developing cement dermatitis. Symptoms of exposure include itchy, tender, swollen, hot, cracked or blistering skin with the potential for sensitisation. The dermatitis is due to the presence of soluble (hexavalent) chromium.

IARC – GROUP 1 – PROVEN HUMAN CARCINOGEN. This product contains an ingredient for which there is sufficient evidence to have been classified by the International Agency for Research into Cancer as a human carcinogen. The use of products known to be human carcinogens should be strictly monitored and controlled.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The Recommendation for protective equipment contained within this SDS report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare an SDS report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

ABBREVIATIONS:

SDS – Safety Data Sheet

mg/m³ – Milligrams per cubic metre

ppm – Parts Per Million

ES-TWA – Exposure Standard - Time Weighted Average

CNS – Central Nervous System

NOS – Not Otherwise Specified

pH – relates to hydrogen ion concentration – this value will relate to a scale of 0 – 14, where 0 is highly acidic and 14 is highly alkaline.

CAS# - Chemical Abstract Service Number – used to uniquely identify chemical compounds.

IARC – International Agency for Research on Cancer.

WES-TWA – Workplace Exposure Standard – Time Weighted Average

Report Status

This document has been compiled by Adelaide Brighton Cement the manufacturer of the product and serves as the manufacturer's Safety Data Sheet .

While the information in this Safety Data Sheet has been prepared in good faith, Adelaide Brighton Cement Limited does not warrant that the information is accurate, complete or up to date.



Adelaide Brighton Cement Ltd

Safety Data Sheet

Product Name AUSTWELL CLASS G (HSR) CEMENT



API Licence No.
10A - 00043

Contact Point

For further information on this product contact:

Telephone: Office hours 08 8300 0300
After hours 08 8300 0530
Facsimile: 08 8341 1591
Web site: www.adelaidebrighton.com.au

Advice Note

The information in this document is believed to be accurate. Please check the currency of this SDS by contacting:

08 8300 0300
or
www.adelaidebrighton.com.au

Each user of any information, or any product referred to, in this Safety Data Sheet must:

- determine whether the information or product is suitable for their purpose;
- assess and control any risks associated with the information or product; and
- obtain professional advice in relation to the use of the information or product.

To the extent permitted by law, Adelaide Brighton Cement Limited:

- excludes all representations, warranties and guarantees in relation to any information in this Safety Data Sheet; and
- will not be liable for any direct, indirect, consequential, incidental, special or economic loss (including but not limited to any loss of actual or anticipated profits, revenue, savings, production, business, opportunity, access to markets, goodwill, reputation, publicity, or use) arising from any use of or reliance on any information in this Safety Data Sheet.

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: TUNED SPACER E+

Revision Date: 16-Sep-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: TUNED SPACER E+
Synonyms: None
Chemical Family: Mineral
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Cement Spacer

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT (w/w)	Australia	NOHSC	New Zealand	ACGIH TLV-TWA
			WES			
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable	TWA: 1 mg/m ³	
Crystalline silica, quartz	14808-60-7	1 - 5%	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.025 mg/m ³	

Crystalline silica, cristobalite	14464-46-1	0 - 1%	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.025 mg/m ³
Crystalline silica, tridymite	15468-32-3	0 - 1%	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	0.05 mg/m ³

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

Risk Phrases

R49 May cause cancer by inhalation.

R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

HSNO Classification

6.7A Known or presumed human carcinogens

6.9A Toxic to human target organs or systems

4. FIRST AID MEASURES

Inhalation

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

Skin

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

Eyes

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion

Under normal conditions, first aid procedures are not required.

Notes to Physician

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

Special Exposure Hazards

Decomposition in fire may produce toxic gases.

Special Protective Equipment for Fire-Fighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment. Avoid creating and breathing dust.
Environmental Precautionary Measures	None known.
Procedure for Cleaning / Absorption	Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149 (FFP2/FFP3), or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	White to light straw
Odor:	Odorless
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (kg/l):	Not Determined
Bulk Density @ 20 C (kg/M3):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined

Flammability Limits in Air - Lower (g/m ³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m ³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	5
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Oxides of sulfur. Carbon monoxide and carbon dioxide. Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure

Acute Toxicity

Inhalation

Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

Eye Contact

May cause eye irritation.

Skin Contact

May cause mechanical skin irritation.

Ingestion

None known

Chronic Effects/Carcinogenicity

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Bentonite	1302-78-9	5000 mg/kg (Rat)	No data available	No data available
Crystalline silica, quartz	14808-60-7	500 mg/kg (Rat)	No data available	No data available
Crystalline silica, cristobalite	14464-46-1	No data available	No data available	No data available
Crystalline silica, tridymite	15468-32-3	No data available	No data available	No data available

12. ECOLOGICAL INFORMATION

Ecotoxicological Information

Ecotoxicity Product

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined

Ecotoxicity Substance

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Bentonite	1302-78-9	No information available	TLM96: 10000 ppm (Oncorhynchus mykiss)	No information available	No information available
Crystalline silica, quartz	14808-60-7	No information available	No information available	No information available	No information available
Crystalline silica, cristobalite	14464-46-1	No information available	No information available	No information available	No information available
Crystalline silica, tridymite	15468-32-3	No information available	No information available	No information available	No information available

12.2 Persistence and degradability

No information available

12.3 Bioaccumulative potential

No information available

12.4 Mobility in soil

No information available

12.5 Results of PBT and vPvB assessment

No information available.

12.6 Other adverse effects

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR

Not restricted

Air Transportation

ICAO/IATA

Not restricted

Sea Transportation

IMDG

Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed on inventory or are exempt.

New Zealand Inventory of Chemicals All components listed on inventory or are exempt.

US TSCA Inventory All components listed on inventory or are exempt.

EINECS Inventory This product, and all its components, complies with EINECS

Classification T - Toxic.

Crystalline silica is not classified as a carcinogen in EU Council Directives 67/548/EEC and 88/379/EEC.

Risk Phrases R49 May cause cancer by inhalation.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Safety Phrases

S53 Avoid exposure - obtain special instructions before use.
S22 Do not breathe dust.
S38 In case of insufficient ventilation wear suitable respiratory equipment.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS

Not applicable

Contact**Australian Poisons Information Centre**

24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: SILICALITE LIQUID

Revision Date: 22-Feb-2012

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: SILICALITE LIQUID
Synonyms: None
Chemical Family: Blend
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Light Weight Cement Additive

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Silica, amorphous - fumed	7631-86-9	30 - 60%	2 mg/m ³	Not applicable	2 mg/m ³

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye irritation.

Risk Phrases None

HSNO Classification Not Determined

4. FIRST AID MEASURES

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

Skin Wash with soap and water.

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media All standard fire fighting media

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

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing.

Storage Information Keep container closed when not in use. Product has a shelf life of 24 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use in a well ventilated area.

Respiratory Protection	Not normally necessary.
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Dark gray
Odor:	Odorless
pH:	6- 8
Specific Gravity @ 20 C (Water=1):	1.37
Density @ 20 C (kg/l):	1.397
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	100
Freezing Point/Range (C):	0
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	100
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	22.9
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Miscible
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	None known.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye and skin contact.
Inhalation	None known.
Skin Contact	Practically Non-toxic by Skin Contact.
Eye Contact	May cause mild eye irritation.
Ingestion	None known
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Ames Test: Negative

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	This product does not comply with NZIOC
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS

Classification Not Classified

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS

Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: **SCR-100L**

Revision Date: 12-Apr-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: SCR-100L
Synonyms: None
Chemical Family: Anionic Polymer
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Retarder

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Contains no hazardous substances	Mixture	60 - 100%	Not applicable	Not applicable	Not applicable

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye irritation.

HSNO Classification Non-hazardous

4. FIRST AID MEASURES

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

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

Eyes Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media All standard fire fighting media

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

Special Exposure Hazards Decomposition in fire may produce toxic gases.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing.

Storage Information Store away from oxidizers. Store in a dry location. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use in a well ventilated area.

Respiratory Protection	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Dust/mist respirator. (N95, P2/P3)
Hand Protection	Impervious rubber gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Blue
Odor:	Odorless
pH:	3 - 4 (28%)
Specific Gravity @ 20 C (Water=1):	1.16
Density @ 20 C (kg/l):	1.16
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	-4
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined Min: > 93
Flash Point Method:	PMCC
Autoignition Temperature (C):	520
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	~60
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	15-30 (25C)
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Oxides of nitrogen. Oxides of sulfur. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Symptoms related to exposure	
Inhalation	May cause respiratory irritation.
Skin Contact	May cause mild skin irritation.
Eye Contact	May cause mild eye irritation.
Ingestion	Irritation of the mouth, throat, and stomach.
Aggravated Medical Conditions	Skin disorders.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Bury in a licensed landfill or burn in an approved incinerator according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.
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Contaminated Packaging

Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

14. TRANSPORT INFORMATION**Land Transportation**

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION**Chemical Inventories**

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	All components listed on inventory or are exempt.
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS

Classification Not Classified

Risk Phrases Not classified

Safety Phrases Not classified

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: **NF-6**

Revision Date: 10-Apr-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: NF-6
Synonyms: None
Chemical Family: Blend
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Defoamer

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Vegetable oil	Proprietary	60 - 100%	10 mg/m ³	Not applicable	Not applicable
Aluminum stearate	637-12-7	1 - 5%	10 mg/m ³	Not applicable	2 mg/m ³

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview	May cause mild eye, skin, and respiratory irritation. May be harmful if swallowed.
Risk Phrases	None
HSNO Classification	9.1D Slightly harmful in the aquatic environment

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.
Notes to Physician	Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Carbon dioxide, dry chemical, foam.
Extinguishing media which must not be used for safety reasons	None known.
Special Exposure Hazards	Use water spray to cool fire exposed surfaces. Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors.
Storage Information	Store away from oxidizers. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.
Respiratory Protection	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Organic vapor respirator with a dust/mist filter. (A2P2/P3)
Hand Protection	Polyvinylchloride gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Yellow
Odor:	Mild
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	0.93
Density @ 20 C (kg/l):	0.93
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	182
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	>170
Flash Point Method:	Not Determined
Autoignition Temperature (C):	385
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Disperses
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None known.
Incompatibility (Materials to Avoid)	Strong oxidizers.

Hazardous Decomposition Products Hydrocarbons. Carbon monoxide and carbon dioxide.

Additional Guidelines Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure

Inhalation None known.

Skin Contact May cause mild skin irritation. May cause an allergic skin reaction.

Eye Contact May cause mild eye irritation.

Ingestion May cause abdominal pain, vomiting, nausea, and diarrhea.

Aggravated Medical Conditions None known.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 1% are chronic health hazards.

Other Information None known.

Toxicity Tests

Oral Toxicity: Not determined

Dermal Toxicity: Not determined

Inhalation Toxicity: Not determined

Primary Irritation Effect: Not determined

Carcinogenicity Not determined

Genotoxicity: Not determined

Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined

Persistence/Degradability Readily biodegradable

Bio-accumulation Not determined

Ecotoxicological Information

Acute Fish Toxicity: Not determined

Acute Crustaceans Toxicity: Not determined

Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Incineration recommended in approved incinerator according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.

Contaminated Packaging Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals All components listed on inventory or are exempt.
US TSCA Inventory All components listed on inventory or are exempt.
EINECS Inventory This product, and all its components, complies with EINECS

Classification Not Classified

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: HR-25L

Revision Date: 14-May-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING
--

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: HR-25L
Synonyms: None
Chemical Family: Organic acid
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Cement Retarder

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS
--

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Tartaric acid	87-69-4	30 - 60%	Not applicable	Not applicable	Not applicable

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview	May cause eye, skin, and respiratory irritation.
Risk Phrases	R41 Risk of serious damage to eyes.
HSNO Classification	8.3A Corrosive to ocular tissue 9.3C Harmful to terrestrial vertebrates

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.
Eyes	In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.
Ingestion	Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.
Notes to Physician	Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	All standard fire fighting media
Extinguishing media which must not be used for safety reasons	None known.
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.
Storage Information	Store away from alkalis. Store away from oxidizers. Store in a cool well ventilated area. Keep container closed when not in use. Product has a shelf life of 60 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.
Respiratory Protection	Dust/mist respirator. (N95, P2/P3)
Hand Protection	Impervious rubber gloves.
Skin Protection	Rubber apron.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Light yellow-green
Odor:	Odorless
pH:	1.7
Specific Gravity @ 20 C (Water=1):	1.2
Density @ 20 C (kg/l):	1.2
Bulk Density @ 20 C (kg/m ³):	Not Determined
Boiling Point/Range (C):	103
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m ³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m ³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	60
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers. Strong alkalis.
Hazardous Decomposition Products	Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Symptoms related to exposure	
Inhalation	May cause respiratory irritation.
Skin Contact	May cause skin irritation.
Eye Contact	May cause moderate eye irritation.
Ingestion	Irritation of the mouth, throat, and stomach.
Aggravated Medical Conditions	Skin disorders.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not determined
Ecotoxicological Information	
Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations. Incineration recommended in approved incinerator according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.
Contaminated Packaging	Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	All components listed on inventory or are exempt.
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS

Classification Xi - Irritant.

Risk Phrases R41 Risk of serious damage to eyes.

Safety Phrases S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Contact

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre

0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: HR-6L

Revision Date: 02-May-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING
--

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: HR-6L
Synonyms: None
Chemical Family: Lignosulfonate
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Cement Retarder

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS
--

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Modified lignosulfonate	Proprietary	30 - 60%	Not applicable	Not applicable	Not applicable

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye and respiratory irritation.

Risk Phrases None

HSNO Classification Non-hazardous

4. FIRST AID MEASURES

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

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

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Under normal conditions, first aid procedures are not required.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media Water fog, carbon dioxide, foam, dry chemical.

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

Special Exposure Hazards Decomposition in fire may produce toxic gases.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing. Avoid breathing vapors.

Storage Information Store away from oxidizers. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use in a well ventilated area.

Respiratory Protection	Not normally necessary.
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Dark brown
Odor:	Molasses
pH:	9.5
Specific Gravity @ 20 C (Water=1):	1.21
Density @ 20 C (kg/l):	1.208
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined Min: > 98
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Oxides of sulfur. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Symptoms related to exposure	
Inhalation	May cause mild respiratory irritation.
Skin Contact	None known.
Eye Contact	May cause mild eye irritation.
Ingestion	None known
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Slowly biodegradable
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	This product is not regarded as hazardous waste. Dispose in accordance with local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	All components listed on inventory or are exempt.
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS

Classification Not Classified

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

MATERIAL SAFETY DATA SHEET

Product Trade Name: HALAD® 413L CEMENT ADDITIVE

Revision Date: 02-May-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone

Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone

Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: HALAD® 413L CEMENT ADDITIVE
Synonyms: None
Chemical Family: Polymer
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Fluid Loss Additive

Prepared By Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Acrylic polymer	Proprietary	10 - 30%	Not applicable	Not applicable	Not applicable

HALAD® 413L CEMENT ADDITIVE

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview No significant hazards expected.

Risk Phrases None

HSNO Classification Non-hazardous

4. FIRST AID MEASURES

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

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

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Under normal conditions, first aid procedures are not required.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media All standard fire fighting media

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

Special Exposure Hazards Decomposition in fire may produce toxic gases.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing.

Storage Information Store away from oxidizers. Product has a shelf life of 24 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use in a well ventilated area.

Respiratory Protection	If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.
	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Dust/mist respirator. (N95, P2/P3)
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Brown-black
Odor:	Sweet
pH:	7.5
Specific Gravity @ 20 C (Water=1):	1.1
Density @ 20 C (kg/l):	1.098
Bulk Density @ 20 C (kg/m³):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m³):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m³):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Miscible
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.

Hazardous Decomposition Products Oxides of nitrogen. Carbon monoxide and carbon dioxide.

Additional Guidelines Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure

Inhalation None known.

Skin Contact None known.

Eye Contact None known.

Ingestion None known

Aggravated Medical Conditions None known.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 1% are chronic health hazards.

Other Information None known.

Toxicity Tests

Oral Toxicity: LD50: > 5000 mg/kg (Rat)

Dermal Toxicity: LD50: > 2000 mg/kg (Rabbit)

Inhalation Toxicity: Not determined

Primary Irritation Effect: Draize Rating (Skin): 0.09/8.0 (Rabbit) Practically Non-irritating

Carcinogenicity Not determined

Genotoxicity: Not determined

Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined

Persistence/Degradability Slowly biodegradable

Bio-accumulation Not determined

Ecotoxicological Information

Acute Fish Toxicity: Not determined

Acute Crustaceans Toxicity: Not determined

Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory Product contains one or more components not listed on inventory.
New Zealand Inventory of Chemicals All components listed on inventory or are exempt.
US TSCA Inventory All components listed on inventory or are exempt.
EINECS Inventory This product does not comply with EINECS

Classification Not Classified

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

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*****END OF MSDS*****