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July 2012

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME  
(NICNAS)**

**FULL PUBLIC REPORT**

**HALAD 413**

This Self Assessment has been compiled by the applicant and adopted by NICNAS in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS), administered by the Department of Health and Ageing and the Department of Sustainability, Environment, Water, Population and Communities have screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Public Report is also available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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**Director  
NICNAS**

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### **SUMMARY**

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	MAXIMUM INTRODUCTION VOLUME	USE
SAPLC/135	Halliburton Australia Pty Ltd	HALAD 413	No	100-125 tonnes per annum	Additive in oilfield cements

### **CONCLUSIONS AND REGULATORY OBLIGATIONS**

#### **Level of Concern for Occupational Health and Safety**

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

#### **Level of Concern for Public Health**

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

#### **Level of Concern for the Environment**

The polymer is not considered to pose an unreasonable risk to the environment based on its assessed use pattern.

### **RECOMMENDATIONS**

#### **CONTROL MEASURES**

##### **Occupational Health and Safety**

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer when in the powdered form:  
Local exhaust ventilation
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:  
Avoid inhalation of dusts  
Avoid skin and eye contact when in the powder form
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer when in the powdered form:  
Respiratory protection (i.e. dust masks)
- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

##### **Disposal**

- The notified polymer should be disposed of to landfill.

### Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

### Secondary Notification

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the polymer under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 64(1) of the Act; if
  - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.or
- (2) Under Section 64(2) of the Act; if
  - the function or use of the notified polymer has changed from an additive for oilfield cements;
  - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
  - the notified polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the notified polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

### Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

## ASSESSMENT DETAILS

### HALAD 413

#### 1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT  
Halliburton Australia Pty Ltd (ABN: 73 009 000 775)  
53-55 Bannister Road,  
CANNING VALE WA 6155

NOTIFICATION CATEGORY  
Self Assessment: Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)  
Data items and details claimed exempt from publication:  
Chemical Name, Other Names, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, and Import Volume.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)  
None

NOTIFICATION IN OTHER COUNTRIES

North Sea (2000; HOCNF)  
USA (TSCA)  
Canada (NDSL)

## 2. IDENTITY OF CHEMICAL

MARKETING NAME(S)  
HALAD 413 (100% of notified polymer)  
HALAD 413L (notified polymer in water)

MOLECULAR WEIGHT (MW)  
Number Average Molecular Weight (NAMW) > 10,000 Da

REACTIVE FUNCTIONAL GROUPS  
The notified polymer contains only low concern functional groups.

## 3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	N/A
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

## 4. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	HALAD 413 is a black powder HALAD 413L is a black liquid
<b>Melting Point/Glass Transition Temp</b>	Not available due to its highly cross-linked nature.
<b>Density</b>	1480 kg/m <sup>3</sup> at 20°C
<b>Water Solubility</b>	Not determined. Expected to be water soluble based on the presence of hydrophilic functional groups and use in aqueous systems.
<b>Dissociation Constant</b>	Not determined. The notified polymer contains functionality that is expected to be ionised in the environmental pH range (4 – 9).
<b>Particle Size</b>	37 - 400 micron; mean 177 micron
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Degradation Products</b>	None under normal conditions of use

## 5. INTRODUCTION AND USE INFORMATION

### MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	100 -125	100 -125	100 -125	100 -125	100 -125

### USE AND MODE OF INTRODUCTION AND DISPOSAL

#### Mode of Introduction

The notified polymer will be imported as a powder (HALAD® 413), contained in multi-walled paper bags and as a liquid (HALAD® 413L) in plastic pails or plastic drums. It will be imported into Perth, Adelaide, Melbourne and Brisbane and stored at the notifier's warehouse before being transported by truck to field locations for use in cement blends.

#### Reformulation/manufacture processes

The notified polymer will not be manufactured or reformulated in Australia.

#### Use

The notified polymer is a fluid loss additive for oilfield cements. In oilfield cementing operations, loss of the fluid can severely affect the performance of the slurry and set cement.

## 6. HUMAN HEALTH IMPLICATIONS

### 6.1. Exposure Assessment

#### OCCUPATIONAL EXPOSURE

Dermal and ocular exposure may potentially occur during cement blending processes involving the notified polymer. However, exposure to significant amounts of the notified polymer is limited because of the fully automated processes, engineering controls, and personal protective equipment worn by workers.

The notified polymer is added to dry cement blends and shipped to field locations in bulk trucks. At the field locations, the dry cement is conveyed in an enclosed system to a blender to make a cement slurry with water. The slurry is injected down hole to cement the well.

#### PUBLIC EXPOSURE

The notified polymer is intended only for use in industry and as such public exposure to the notified polymer is not expected. The notified polymer used for cementing the well will be bound up in the cement matrix, and hence will not be mobile in the environment and exposure is unlikely to occur.

### 6.2. Toxicological Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

The powder may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled. Repeated or prolonged skin contact may result in mild irritation.

### 6.3. Human Health Risk Assessment

#### OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is expected to be low, based on the minimal exposure to workers and the low intrinsic hazard of the polymer.

#### PUBLIC HEALTH

As there will be no exposure of the public to the notified polymer or products containing the notified polymer, the risk to the public from exposure to the notified polymer is considered to be negligible and the risk to the public health is not considered to be unreasonable given the predicted low hazard of the notified polymer.

## 7. ENVIRONMENTAL IMPLICATIONS

### 7.1. Exposure Assessment

#### ENVIRONMENTAL RELEASE

The notified polymer will not be manufactured in Australia. Therefore, release to the environment could only occur through accidental spills or leaks of the storage containers during shipping, transport and warehousing. The notified polymer used for cementing wells will be bound up in a solid cement matrix, and hence will not be released into the environment. Empty storage containers containing notified polymer residues will be consigned to landfills.

#### ENVIRONMENTAL FATE

The majority of the imported notified polymer will be trapped within an inert solid matrix of set cement and is not expected to be mobile, degradable nor bioavailable in this form. The unbound notified polymer is water soluble, expected to be hydrolytically stable and not expected to biodegrade rapidly in seawater (6% in 28 days, OECD TG 306). Based on its very high molecular weight, the unbound notified polymer is expected to have a reduced mobility in soils and sediments. The notified polymer's high molecular weight will preclude absorption across biological membranes and thus it is unlikely to bioaccumulate. The notified polymer is expected to slowly degrade into oxides of carbon, nitrogen, sulphur and water.

### 7.2. Environmental Hazard Characterisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This is supported by environmental endpoints observed in testing conducted on the notified or analogue polymer.

<i>Endpoint</i>	<i>Result</i>	<i>Test Guideline</i>
Fish Toxicity	LC50 > 1000 mg/L	OECD 203
Aquatic Invertebrate Toxicity	LC50 > 2000 mg/L	ISO/TC147/SC5/WG2
Algal Toxicity	EC50 = 1102 mg/L	ISO 10253
Sediment Reworker Toxicity	LC50 = 47,042 mg/kg	PARCOM 1995

All results on marine test organisms were indicative of low hazard.

The acute toxicity and biodegradability potential of the notified polymer were evaluated previously using standardized tests in accordance with OECD and ISO protocols as part of the Harmonised Offshore Chemical Notification under OSPAR. It is clear from these studies that the notified polymer has very low aquatic toxicity.

#### Fish Toxicity (*Scophthalmus maximus*)

All parameters recorded during the test were within protocol specifications, except for the pH reading which were slightly above the recommended value of 8.5 in all test vessels at various points. However, as no adverse effects were noticed in any of the test vessels it was concluded that this slight deviation had no effect on the overall test conclusion. All animals in control vessels survived the 96 hour test period. The NOEC was 1000 mg/L.

#### Aquatic Invertebrate Toxicity (*Acartia tonsa*)

The validity criteria set out in the test protocol were met. The NOEC was 2000 mg/L.

#### Algal Toxicity (*Skeletonema costatum*)

The validity criteria set out in the test protocol were met. The cell density was measured manually with a Fuchs-Rosenthal counting chamber due to high particle content and high fluorescence of the test substance. The NOEC was 100 mg/L based on growth rate.

### 7.3. Environmental Risk Assessment

The notified polymer will be used as cement additive. Once the cement has been set, the notified polymer is expected to remain within the cement matrix. Hence, the vast majority of the notified polymer will not be released to the environment. Any waste, is anticipated to be disposed of in a landfill. The notified polymer is expected to ultimately degrade into oxides of carbon, nitrogen,

sulphur and water. The above considerations indicate minimal risk to the environment when the notified polymer is used in the manner and levels indicated by the notifier. The notified polymer is not likely to present a risk to the environment when it is stored, transported, used, recycled and disposed of in the proposed manner.