

File No PLC/709

July 2007

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

**FULL PUBLIC REPORT**

**Polymer in GEROPON HW 15**

This Assessment has been compiled 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) is administered by the Department of Health and Ageing, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment and Water Resources.

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 334-336 Illawarra Road, Marrickville NSW 2204.

This Full 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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**FULL PUBLIC REPORT****Polymer in GEROPON HW 15****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Rhodia Australia Pty Ltd (ABN 24 050 029 000)  
352 Ferntree Gully Road  
Clayton VIC 3168

## NOTIFICATION CATEGORY

Polymer of Low Concern

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details, Import Volume

## VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

## PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

## NOTIFICATION IN OTHER COUNTRIES

Canada (NSN 13542, 2006)

**2. IDENTITY OF CHEMICAL**

## OTHER NAME(S)

Alkyl polyether carboxylic acid

## MARKETING NAME(S)

Geropon HW-15 (> 80% notified polymer dispersion in water)

% of Low MW Species < 1000 < 20%

% of Low MW Species < 500 < 5%

## MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) > 1000

## REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

**3. PLC CRITERIA JUSTIFICATION**

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</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	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

#### 4. PHYSICAL AND CHEMICAL PROPERTIES

The following properties are for the notified polymer solution in water to be imported as the polymer is not isolated.

<b>Appearance at 20°C and 101.3 kPa</b>	Yellow liquid
<b>Melting Point/Glass Transition Temp</b>	Not determined as the notified polymer will be imported in liquid form (i.e. > 80% solution in water).
<b>Density</b>	1020 kg/m <sup>3</sup> at 20°C
<b>Water Solubility</b>	Highly soluble in water (>80% solution in water)
<b>Dissociation Constant</b>	Not determined. The notified polymer contains functional groups which are expected to have typical pKa values of 3-4.
<b>Particle Size</b>	Not applicable. The notified polymer will be imported in a liquid.
<b>Reactivity</b>	Stable under normal environmental conditions. Reacts with strong oxidising agents.
<b>Degradation Products</b>	On thermal decomposition (pyrolysis) releases: carbon monoxide and carbon dioxide.

#### 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>	< 60	< 60	< 60	< 60	< 60

##### USE AND MODE OF INTRODUCTION AND DISPOSAL

###### Mode of Introduction

The notified polymer will be imported as a > 80% solution in water, contained in closed 200 L steel drums, and then formulated in Australia into water-based synthetic or semi-synthetic cutting fluids for the metal treatment market.

###### Reformulation/manufacture processes

The notified polymer will be imported as a solution in water. It will be transported from the wharf to the applicant's warehouse by truck, where it will be stored before being on-sold to metal working fluid formulators.

###### Formulation site

A total of 20 plant operators per site will handle the notified polymer, including formulation. Formulation will involve opening of the 200 L drums, inserting pumping equipment and pumping the notified polymer from the original drums (after weighing) into blending tanks where it will be mixed with water and other additives to produce the metalworking concentrates, which will then be pumped into drums for sale to metalworking customers. These operations will be carried out under local exhaust ventilation. The finished metalworking fluids will contain < 20% of the notified polymer.

###### Laboratory Staff

During formulation, sampling and testing of the metalworking concentrates will occur. The notified polymer will be handled in small quantities under laboratory conditions, by 2 laboratory chemists.

*Metalworking Operators*

The notified polymer will be diluted in metalworking baths of volume between 200 L and 110000 L to a concentration of 1:20 and 1:50 for final application. The baths will be topped up as required. The contents of the baths will be changed every 12 months and the used fluids will be disposed of by waste disposal contractors. The initial dosing will be in bulk from drums or bulk tanks, and maintenance of the concentrate level will be by automatic dosing pump from these sources.

Local exhaust ventilation will be used during weighing, chemical transfer, mixing and general metalworking operations.

It is expected that approximately 50 metalworkers will be exposed to fluids containing the notified polymer. Exposure is expected for approximately 2 hours per day, 100 days per year.

**Use**

The notified polymer will be used as a component, at a concentration of < 20%, in metal cutting fluids.

**6. HUMAN HEALTH IMPLICATIONS****6.1. Exposure Assessment****OCCUPATIONAL EXPOSURE**

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment expected to be worn by workers.

Workers may be exposed to metal cutting fluids at the end use site. However, exposure to significant amounts of the notified polymer is limited because of its low concentration in the end use products, engineering controls and personal protective equipment expected to be worn by workers.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

**PUBLIC EXPOSURE**

The notified polymer is intended only for use in industry and as such public exposure to the notified chemical is not expected.

**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.

**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 the risk to the public from exposure to the notified polymer is considered to be negligible. If accidental exposure of the public occurred, the risk to the public would be low because of the low hazard of the notified polymer.

**7. ENVIRONMENTAL IMPLICATIONS**

### 7.1. Exposure Assessment

#### ENVIRONMENTAL RELEASE

Release to the environment during shipping, transport and warehousing may occur through accidental spills or leakage of the drums. During formulation and packaging, spills are expected to be minimal. When spills occur they will be contained by bunding, collected with absorbent material (dry sand) and sent to a licensed off site waste disposal centre. Empty drums from import will be sent to drum reconditioners. Total waste from all sources is expected to be approximately 2% of the import volume (~ 1200 kg per annum).

Metal cutting fluids are used in manufacturing industries for cooling and lubricating machine tools (eg. drill bits, mechanical hacksaws), and are normally used in semi-enclosed circulatory systems. While small quantities of the fluids are lost during use from splashes and leaks, large scale release during use is unlikely. Usually the cutting fluids are replaced periodically (typically every 12 months), and the spent cutting oil is removed by waste contractors for disposal, and subjected to oil/water separation procedures prior to the aqueous component being released to metropolitan sewage systems with the oily sludge being sent for incineration. Small amounts of the notified polymer are expected to remain associated with the oil component, and be incinerated. Alternatively, the fluid may be treated in a biological (activated sludge) plant prior to discharge of the treated effluent to sewer. If the used oil is treated biologically, much of the polymer is expected to become associated with the biomass and degrade through biological processes. The disposal practices described above are likely to be routine only at the larger industrial facilities using cutting fluids, and possibly only 50% of the material used would be disposed of in this manner. The remaining 50% (originating from smaller factories) may be released directly to sewer, storm water drains or be placed into landfill.

#### ENVIRONMENTAL FATE

The notified polymer's high molecular weight suggests that it is unlikely to cross biological membranes and bioaccumulate. If released to water it would be expected to partition to the aqueous phase as the notified polymer is highly soluble in water.

Although the notified polymer contains hydrolysable groups, hydrolysis is unlikely to occur under environmental pH range.

Some sludge containing waste material may be incinerated with production of water and carbon dioxide.

### 7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted.

Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This does not apply to the notified polymer containing terminal carboxylic acid. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

### 7.3. Environmental Risk Assessment

Up to 60 tonnes of the polymer will be used in metalworking fluids, these fluids will be collected in a sump and usually spent fluid will be removed from the sump (typically after 12 months) by waste contractors for disposal. However, it is estimated that in a worst case scenario, up to 50% of the material used (ie. up to 30 tonnes per annum) may be released to the sewer system.

Assuming nationwide use of the material, and that all estimated 30 tonnes are released annually without degradation to the sewer system:

Amount released to sewer:	30,000 kg
Population:	20 million
Water use per person:	200 L/day
Number of days used:	365
PEC <sub>sewer</sub>	0.2 mg/L

PEC <sub>inland</sub> (dilution factor 1)	0.2 mg/L
PEC <sub>ocean</sub> (dilution factor 10)	0.02 mg/L

It should be noted that estimates provided in table above assume no degradation of a chemical and thus PEC values are likely to be significant overestimates. Therefore, based on the above calculations and the low aquatic toxicity of the notified polymer, the proposed use of the notified polymer is unlikely to pose a risk to the aquatic compartment.

Given the above, the overall environmental risk is expected to be acceptable under the proposed use pattern.

## 8. CONCLUSIONS

### 8.1. Level of Concern for Occupational Health and Safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

### 8.2. Level of Concern for Public Health

There is Negligible Concern to public health when used in the proposed manner.

### 8.3. Level of Concern for the Environment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

## 9. MATERIAL SAFETY DATA SHEET

### 9.1. 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.

## 10. RECOMMENDATIONS

### CONTROL MEASURES

#### Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation.

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

- 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.

#### Environment

#### Disposal

- The notified polymer should be disposed of by incineration.

#### Emergency procedures

- Dike spill using absorbent or inert materials such as earth, dry sand, vermiculite or other inert

materials to prevent run-off into drains and waterways. Clean up spill area using non-sparking tools or HEPA vacuum system into an appropriate closed container for later disposal. Collect and contain contaminated absorbent and dike material for disposal. Clean up residual material by washing area with water. Collect any cleaning water for subsequent disposal through a licensed waste disposal contractor. Do not flush to drains, waterways or sewers.

#### **10.1. Secondary Notification**

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

- (1) Under subsection 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 subsection 64(2) of the Act:
  - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.