File No PLC/1056

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

Polymer in Bayhydrol A 2695

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government Department of Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this 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

June 2012

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SUMMARY

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

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1056	Bayer MaterialScience Pty Ltd	Polymer in Bayhydrol A 2695	No	≤50 tonnes per annum	Component of coatings

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

Environmental Risk Assessment
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- 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.

- Respiratory protection and local exhaust ventilation should be used to prevent inhalation exposure during reformulation and application of the two-part waterborne polyurethane coating systems containing the notified polymer.

- 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.

Environmental Recommendations
- No specific control measures are required to minimise release of the notified polymer to the environment.

Disposal
- The notified polymer should be disposed to landfill.

Storage
- The following precautions should be taken by workers regarding storage of the notified polymer:

- Store in a segregated and approved area.
- Store in original container protected from direct sunlight in a dry, cool and well ventilated area, away from incompatible materials (oxidising substances, strong acids, strong bases).

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 a component of coatings, or is likely to change significantly;
- 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 MSDS of the product containing the notified polymer was provided by the applicant. The accuracy of the information on the MSDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants
Bayer MaterialScience Pty Ltd (ABN: 18 086 237 765)
17-19 Wangara Road
Cheltenham, Victoria 3207

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, and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)
Bayhydrol A 2695 (contains < 45% notified polymer)

Molecular Weight
Number Average Molecular Weight (Mn) is > 1,000 Da

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
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

Appearance at 20 °C and 101.3 kPa	Milky liquid
Melting Point	0 °C *
Density	1,060 kg/m^3 at 20 °C*
Water Solubility	Expected to be water dispersible based on the presence of hydrophilic functionality and its use in aqueous products
Dissociation Constant	The notified polymer is a salt and may be ionised under environmental conditions
Reactivity	Stable under normal use conditions
Degradation Products	Not known

* For imported product containing the notified polymer at < 45%

5. INTRODUCTION AND USE INFORMATION

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	1-50	1-50	1-50	1-50	1-50

Use
The notified polymer will not be manufactured in Australia.
The notified polymer will be imported into Australia at a concentration of < 45%.
Products containing the notified polymer will be reformulated in Australia.
The notified polymer will be used as a component of two-part waterborne polyurethane coating systems for concrete walls and floors, at concentrations up to 30%.

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard. The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer and it is therefore not considered to be an over-chelation hazard to algae.

Release of the notified polymer from accidental spills during transport, handling and storage is estimated to be a maximum of 0.1% of the import volume. Spills are expected to be contained, collected with inert adsorbent material (such as sand, soil or vermiculite) and disposed of to landfill. Release during reformulation will be limited to residues in empty containers and release during cleaning operations. Residue in the 205 L steel imported containers is expected to be approximately 0.2% of the total amount imported and will be disposed of to landfill. Cleaning of formulation equipment is expected to result in approximately 1% of imported polymer being collected in storage containers and disposed of according to local, State and Federal regulations, namely to landfill.

During application of coatings containing the notified polymer onto walls and floors by commercial users, release to the environment may occur from disposal of residues in empty containers (2%) spills (2%) and from cleaning of equipment (5%). Brushes and rollers will be cleaned by wiping them on newspaper followed by rinsing in water. Similarly, mixing buckets and empty coating containers will be rinsed with water and the water will be disposed of to sewer. The used newspaper and any drop sheets, cleaning cloths or rags are likely to be disposed of to landfill.

Under a worst case scenario it will be assumed that 7% of the imported polymer will be washed into sewers over 260 work-days per annum. Assuming that none of the notified polymer will be removed via absorption to sludge in the sewage treatment plant (STP), the resultant predicted environmental concentration (PEC) in sewage effluent on a nationwide basis is estimated as 2.98 μg/L [PEC_{river} = 13.46 kg notified polymer/day ÷ (200 L/person/day × 22.613 million people) × 1 (dilution factor)]. The PEC is well below the EC50 for algae of the most toxic anionic polymers (EC50 > 1 mg/L). The PEC is below the EC50 for algae of the most toxic anionic polymers (EC50 = 1 mg/L). Further, once the two parts of the coating are mixed, cross-linking of the notified polymer with other components of the coating will take place as the coating cures (2 - 4 hours pot life). Thus, the majority of the release will be in the form of the cross-linked polymer. In this situation, up to 90% may be expected to be removed by adsorption to sludge in STPs.

Once cured, the coatings containing the notified polymer will form an inert polymer matrix, and the incorporated notified polymer will not be bioavailable. Discarded coated concrete articles are expected to be sent to landfill at the end of their useful lives. In landfill, the notified polymer contained in solid waste or on coated surfaces is expected to be immobile due to its incorporation into an inert matrix of cured coatings and will eventually degrade via abiotic or biotic processes into water, and oxides of carbon and nitrogen. The notified polymer is not expected to be readily biodegradable, but bioaccumulation is not likely based on its high molecular weight. Therefore, the notified polymer is not considered to pose an unreasonable risk to the aquatic environment based on its assumed low hazard and assessed use pattern.