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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in 03PA086

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Street Address: 334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL: + 61 2 8577 8800
FAX + 61 2 8577 8888.
Website: www.nicnas.gov.au

Director
NICNAS

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Nalco Australia Pty Ltd (ABN 41 000 424 788) of 3 Anderson St, Banksmeadow, NSW, 2019.

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, Use Details, Import Volume.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
03PA086 (contains approximately 0.4% of notified polymer)

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (NAMW) >10000

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

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	Viscous opaque liquid (0.2-2% notified polymer in water)
Melting Point/Glass Transition Temp	Not applicable. Notified polymer not isolated from solution
Density	~1100 kg/m^3 at 20°C (This is an estimate based on a 28% solution of the acid form of the notified polymer)
Water Solubility	Cannot be accurately determined due to the viscosity vs concentration profile of the notified polymer. A 1.6% solution of notified polymer approaches 10000 cps, as higher concentrations are tried to be made a gelatinous paste will be formed so accurate water solubility cannot be found. Estimate < 50000 mg/L.
Dissociation Constant	pKa ~ 4.7
Reactivity	Stable under normal environmental conditions
Degradation Products	There is a susceptible group but hydrolysis in the environmental pH range of 4 to 9 is expected to be low

5. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	0.001 - 1	0.001 - 1	0.001 - 1	0.001 - 1	0.001 - 1

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer is present in 03PA086 containing the notified polymer at concentrations of approximately 0.4%.

03PA086 containing the notified polymer is imported in liquid form in 1000L polyethylene tote boxes or 200L polyethylene drums.

03PA086 containing the notified polymer will be transported from the wharf to the applicants warehouse by truck. Further transport from the applicants warehouse to end use sites will then be required.

Reformulation/manufacture processes

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

Use

The notified polymer produces desired emulsion properties of the product 03PA086, which is used in paper processing. 03PA086 containing the notified polymer can be dosed from bulk tanks (up to 2 tons capacity) or totes directly. 03PA086 containing the notified polymer will be predominantly dosed via diaphragm pump through closed lines into various points of the water circuit of paper manufacturing process to control foam.

03PA086 containing the notified polymer is entirely used in paper processing.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

- Transport and warehousing workers may come into dermal and ocular contact with 03PA086 containing the notified polymer through accidental leaks and spillages of the drums and tote boxes. Exposure to 03PA086 containing the notified polymer is mitigated by use of PPE.
- Connecting hoses between tote boxes and diaphragm dosing pump or between tote boxes and storage tank will involve minor exposure of 03PA086 containing the notified polymer and operators. PPE and engineering controls (hard piping dose line into process) minimises exposure to 03PA086 containing the notified polymer.
- Paper machine operators come into dermal contact with paper machine water. 03PA086 containing the notified polymer is present in low concentrations (10 – 100 ppm). Use of PPE here eliminates exposure to 03PA086 containing the notified polymer.
- After application and incorporation into the paper product the notified polymer is unavailable for exposure.

PUBLIC EXPOSURE

- The notified polymer is intended only for use in industry and as such direct public exposure to the notified polymer is not expected.
- Very low levels of 03PA086 containing the notified polymer could find itself in paper products.
- No release of notified polymer from paper products is expected.

6.2. Toxicological Hazard Characterisation

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

Endpoint	*Result*	*Classified?*	*Effects Observed?*	*Test Guideline*
1. Rat, acute oral	LD50 >5000 mg/kg bw	no	Not reported	Not Given
2. Rat, acute dermal	LD50 >5000 mg/kg bw	no	Not reported	Not Given
4. Rabbit, skin irritation	Slightly irritating	no	Yes	Not Given
5. Rabbit, eye irritation	Slightly irritating	no	Yes	Not Given
6. Skin sensitisation - non-adjuvant test	Non-irritating and non sensitising.	no	no	Human Patch Test
8. Genotoxicity - bacterial reverse mutation	non mutagenic	no	no	Ames Test

Acid form of notified polymer is considered non-toxic by single oral and dermal exposure and no more than slightly irritating to the eyes. Although the acid form of the notified polymer was considered slightly irritating to rabbits in dermal studies, it was found to be non-irritating and non sensitising to humans.

As all results were indicative of low hazard for the acid form of the notified polymer, then the notified polymer is also 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 low hazard and low exposure as well as the engineering controls and personal protective equipment used by workers. The notified polymer may be present in formulations containing hazardous ingredients. 03PA086 containing the notified polymer is classified hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances. For formulations classified as hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

PUBLIC HEALTH

The low hazard of the notified polymer translates to a low risk to the public. In addition, 03PA086 containing the notified polymer will not be sold to the public, only being applied in paper processing plants. Once 03PA086 containing the notified polymer is applied it will be contained in paper products, and hence will not be bioavailable. Risk to the public is considered low.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

Release to the environment of 03PA086 containing the notified polymer during shipping, transport and warehousing will only occur through accidental spills or leaks from tote boxes. Empty tote boxes may contain ~1% 03PA086 containing the notified polymer. This results in <1000 kg/yr 03PA086 containing the notified polymer going to landfill.

Paper machines have closed water systems and effluent water is processed prior to discharge into sewer. 03PA086 containing the notified polymer would be present at a maximum concentration of 10 –100 ppm in effluent if none becomes incorporated in paper. However, it is expected that most of the notified polymer will end up in the paper. Whilst it is not the purpose of the notified polymer to be absorbed to solids, as an anionic based polymer once it is dispersed in water as 03PA086 then the notified polymer has the ability to absorb to paper fibres. Residual notified polymer in effluent (expected to be << 0.1 ppm) will absorb to any other solids present, which will be removed via waste treatment. The literature supports a 90% removal rate for soluble anionic polymers with the notified polymer molecular weight. Solids from waste treatment will end up in landfill. So no notified polymer is expected in the water compartment.

ENVIRONMENTAL FATE

The notified polymer is expected to be hydrolysing slowly at environmental pHs with the resulting polyacrylate copolymer not being readily biodegradable. Due to its anionic nature, it is expected that the notified polymer in landfill will associate with sediments and organic phases of soil and sediments, and slowly degrade to simple carbon compounds.

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 acid form of the notified polymer. The acid form of the notified polymer is practically non-toxic to fish and Daphnia, and slightly acutely toxic to algae. The same low aquatic toxicity is expected for the notified polymer. The PEC for notified polymer is expected to be low once absorption to paper and other effluent solids is taken into consideration.

Endpoint	*Result*	*Effects Observed?*	*Test Guideline*
Fish Toxicity	EC50 96Hr >1000mg/L	Not reported	Not Given
Daphnia Toxicity	EC50 96Hr >1000mg/L	Not reported	Not Given

Algal Toxicity	EC50 72Hr >342 mg/L	Not reported	Not Given
Inhibition of Bacterial Respiration	EC50 >100 mg/L	Not reported	Not Given

All results were indicative of low hazard for the acid form of the notified polymer and also therefore for the notified polymer.

7.3. Environmental Risk Assessment

No aquatic exposure is anticipated during transport and end use of the notified polymer. It is expected that practically all of the notified polymer generated from end user effluent will be disposed of in approved landfills as part of inert solid waste. In landfill, notified polymer will slowly hydrolyse to polyacrylates and will then degrade slowly to harmless simple carbon compounds posing a low risk to the environment.

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

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 No Significant 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 of 03PA086 containing the notified polymer should be easily accessible to employees.

- Notified polymer is not classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances.* 03PA086 containing the notified polymer is classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

- The following control measures should be implemented by the end user to minimise environmental exposure during transfer to storage or storage of 03PA086 containing the notified polymer:
  - Bunding
  - Cap outlets on storage tanks when not in use

Disposal

- Empty containers of 03PA086 containing the notified polymer should be sent to local recycling or waste disposal facilities.

Storage

- The following precautions should be taken by the importer and end user regarding storage of 03PA086 containing the notified polymer:
  - Bunded compounds

Emergency procedures

- Spills/release of 03PA086 containing the notified polymer should be handled by containment with absorbent followed by recovery (when possible) to salvage bins.

10.1. Secondary Notification

The Director of Chemicals Notification and Assessment 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.