File No: PLC/421

11 November 2003

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in NeoRez R-2150

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 Heritage.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
National Occupational Health and Safety Commission
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1161 or + 61 2 6279 1163.

This Full Public Report is 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:

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
Chemicals Notification and Assessment

TABLE OF CONTENTS

FULL PUBLIC REPORT

Polymer in NeoRez R-2150

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Orica Australia Pty Ltd (ABN 004 117 828)
1 Nicholson Street
Melbourne VIC 3000

NOTIFICATION CATEGORY
Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:
Chemical name
CAS number
Molecular formula
Structural formula
Polymer constituents
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
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Polymer in NeoRez R-2150

3. COMPOSITION

ADDITIVES/ADJUVANTS

Chemical Name	Triethylamine		
CAS No.	121-44-8	*Weight %*	<5
Hazardous Properties	Irritating to eyes, respiratory system and skin		

Chemical Name	N-methyl-2-pyrrolidone		
CAS No.	872-50-4	*Weight %*	<30
Hazardous Properties	Irritating to eyes and skin		

PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met (yes/no/not applicable)*
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

The notified polymer will be imported as a 35 % dispersion in water and co-solvent, *N*-methyl pyrrolidone, and never isolated.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	<30	<30	<30	<30	<30

USE

The notified polymer is a component of surface coating for use on timber.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The polymer dispersion containing 35% notified polymer will be imported in 120 L open head polyethylene drums and 1000 kg polyethylene 'Schutz' IBC's. It will be stored at the notifier's warehouse in VIC and NSW prior to transport by road to customers for coating manufacture. There will be 5-10 reformulation sites in Australia, at which up to 100 batches of coating will be manufactured.

The coating manufacture involves weighing and transferring of the polymer and various additives into a high-speed mixer to form a homogeneous coating mixture. Transfer may be by decanting or drum pumps. Samples are taken from the mixer for quality control testing, and the viscosity of the coating is adjusted prior to packing. When the desired viscosity is achieved, the coating mixture is fed by gravity from the bottom of the mixing vessel through a filter into containers. The manufactured coating containing up to 30% notified polymer is packed in 1, 4, 10 and 20 L epoxy lined metal cans and pails. The closed containers are manually put on pallets and then taken by forklift to the warehouse for storage and distribution.

The manufactured coatings containing the notified polymer will be available to both professional painting contractors and do-it-yourself (DIY) home painters. Coating application will generally be done by brush or roller. After application of the paint, it will cure and crosslink, encapsulating the notified polymer, which will no longer be separately available for exposure.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

There is potential for release during the coatings manufacture and application. Any spills that occur

during reformulation will be contained by bunding. Approximately 400 kg per annum of waste is expected to be generated due to spills and cleaning up equipment during coatings manufacture. The import containers, if not rinsed, are expected to contain 200 kg of polymer residue per annum. The aqueous waste from the coatings manufacturing process will be collected by a licensed waste disposal contractor for treatment with flocculants prior to burying in secure landfill.

Empty cans and pails containing dry paint residue (containing 400 kg of the notified polymer per annum) will be consigned to landfills. Up to 800 kg of the notified polymer is expected to be disposed of to the sewer systems during the cleaning of application equipment, especially the brushes or rollers used by DIY home painters.

Once the paint is applied, it is expected to form an inert coating on the surface of timber and the notified polymer will no longer be available for exposure. It will remain on the surface until it is gradually worn down. If applied on floors the coating may be worn down by human traffic and slowly dispersed on shoes. At the end of its useful life it will presumably be removed and replaced by another coat of a similar product. The coating containing the notified polymer will be broken up into solid particulate matter in the sanding/removal process and most likely be disposed of to landfill.

The notified polymer is not expected to cross biological membranes due to its high molecular weight and low water solubility, and is therefore not expected to bioaccumulate.

6.2. Summary of 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 worn by workers.

After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

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

6.3. Summary of Public Exposure

It is expected that during transport, storage, paint manufacture, and most industrial use, exposure of the general public to the notified polymer will be minimal, except in the event of an accidental spill.

Public exposure to surface coatings containing the notified polymer is expected to be widespread but intermittent i.e. limited to periods of timber coating. The likely route of exposure would be dermal, with the possibility of accidental oral and ocular exposure.

Due to the wide range of applications in the domestic and industrial environment, public exposure via dermal contact with dried surface coating films containing the notified polymer is expected to be high.

7. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is produced as an aqueous dispersion and is never isolated. The following physico-chemical properties are for the aqueous dispersion unless otherwise indicated.

Appearance at 20^{o}C and 101.3 kPa	Yellowish liquid
Boiling point	100^{o}C
Density	1040 kg/m^{3}
Water Solubility	Not determined. The final polymer is in dispersion form and must be stabilised against separation from the aqueous phase by partially neutralising the carboxylic acid groups with amine. Only very low molecular weight species (< 500) are anticipated to be water-soluble.
Dissociation Constant	Free carboxylic acids are expected to have typical

	acidity
Reactivity	Stable under normal environmental conditions
Degradation Products	None.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology
No toxicological data were submitted.

8.2. Human Health Hazard Assessment
The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology
No ecotoxicological data were submitted.

9.2. Environmental Hazard Assessment
The products containing the notified polymer are likely to be used throughout Australia. The major environmental exposure is expected to be due to the disposal of waste to landfill from coatings manufacture and application. If spilt on land, the notified polymer is expected to be immobilised in the soil layer. Due to its low water solubility, the polymer will remain bound within the soils and sediments of landfill, and slowly be degraded by the abiotic processes.

The waste polymer is discharged in domestic wash waters to waste water treatment systems through washing of brushes or other equipment. Assuming a worst case scenario with no removal of the notified polymer in the sewage treatment plant, the resultant predicted environmental concentration (PEC) in sewage effluent nationwide, based on the following assumptions, is estimated to be 0.56 µg/L.

Amount entering sewer annually	800 kg
Population of Australia 19.5 million	
Amount of water used per person per day	200 L
Number of days in a year	365

Based on dilution factors of 1 and 10 for inland and ocean discharges of STP-treated effluents, the PECs of the notified polymer in freshwater and marine water may approximate 0.56 or 0.06 µg/L, respectively

It is not possible to assess the risk to aquatic organisms without ecotoxicity data. However, based on the proposed use pattern, the release of the notified polymer to the aquatic environment is expected to be low and dispersed. Adsorption to sludge, soil and sediment as well as dilution in receiving waters should reduce environmental concentrations to negligible levels. Abiotic or slow biotic processes are expected to degrade the notified polymer eventually.

Given the above, environmental exposure and the overall environmental hazard are expected to be low.

10. RISK ASSESSMENT

10.1. Environment
While no toxicity data are available, based on the exposure levels and use pattern, the notified polymer is unlikely to pose an unacceptable risk to the environment.

10.2. Occupational health and safety
The notified polymer is present in an imported formulation containing the hazardous ingredients, triethylamine and N-methyl-n-pyrrolidone. In accord with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, triethylamine and N-methyl-n-pyrrolidone warrant the risk phrases: Irritating to eyes, respiratory system and skin; and Irritating to eyes and

skin, respectively. There is also a NOHSC exposure standard for triethylamine of 12 mg/m^3 or 3 ppm time-weighted-average (TWA) and 20 mg/m^3 or 5 ppm short-term-exposure-limit (STEL). The imported formulation containing the notified polymer is also classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* on the basis of the solvent content. Workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

The OHS risk presented by the notified polymer is expected to be low. The control measures required due to the hazardous components of the imported product will ensure sufficient protection against the notified polymer itself.

10.3. Public health

While dermal and possibly eye contact with the notified polymer may occur during application of the paints containing the polymer by the general public, based on its expected low toxicity, the notified polymer is not expected to pose a significant hazard to public health when used in the proposed manner.

In dried paint films, the notified polymer will be encapsulated in an inert, very high molecular weight matrix, which will render it biologically unavailable. Consequently, the risk from public exposure to the notified polymer from dried paint films is considered to be low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.2. Environmental risk assessment

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

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

There is Low Concern to public health when used as a component of surface coating on timber.

11. MATERIAL SAFETY DATA SHEET

11.1. 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.

12. 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. As the polymer is produced in solvents (triethylamine and N-methyl-2-pyrrolidone) and never isolated, the following guidelines and precautions should be observed:

- To minimise exposure to the product containing the notified polymer, personal protective equipment 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.

- Employers should ensure that NOHSC exposure standards for all of the ingredients of the polymer solution and formulated paints are not exceeded in the workplace

- A copy of the MSDS should be easily accessible to employees.

- 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 manufacturers to minimise environmental exposure during manufacture and use of the notified polymer and paint containing it:
  - Do not allow the polymer, paint products containing the polymer to sewer or containers to contaminate drains or waterways or sewer.

Disposal

- Wastes generated during industrial application should be disposed of through a licensed waste contractor. Wastes generated during domestic use should be disposed of via special chemical waste collections. Empty paint containers should be disposed of via domestic recycling programs.

Emergency procedures

- Spills/release of the notified polymer should be cleaned up immediately.
- Contain the spill and prevent runoff into drains and waterways.
- Use absorbent material (e.g. soil, sand or other inert material).
- Collect and seal spills in properly labelled containers or drums for disposal.

12.1. 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.