File No: PLC/157

June, 2000

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Sclair 10A

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (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 National Occupational Health and Safety Commission which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Family Services.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, National Occupational Health and Safety Commission, 92-94 Parramatta Road, Camperdown NSW 2050, between the following hours:

Monday – Wednesday	8.30 am - 5.00 pm
Thursday	8.30 am - 8.00 pm
Friday	8.30 am - 5.00 pm

Copies of the full public report may also be requested, free of charge, by contacting the Administration Coordinator.

Please direct enquiries or requests for full public reports to the Administration Coordinator at:

Street Address: 92 Parramatta Road, CAMPERDOWN NSW 2050, AUSTRALIA
Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA
Telephone: (61) (02) 9577 9514
Facsimile: (61) (02) 9577 9465

Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Sclair 10A

1. APPLICANT

DuPont (Australia) Ltd of 49-59 Newton Road, Wetherill Park, NSW 2164 has submitted a Polymer of Low Concern notification statement in support of their application for an assessment certificate for Sclair 10A.

2. IDENTITY OF THE CHEMICAL

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

Marketing Name: Sclair 10A, Sclair D041-02

Characterisation as a Synthetic Polymer of Low Concern

Number-Average Molecular Weight (NAMW):	>1000
Maximum Percentage of Low Molecular Weight Species	
Molecular Weight < 500:	nil
Molecular Weight < 1 000:	<1%
Reactive Functional Groups:	None
Residual Monomer Content:	All < 0.01%
Polymer Stability	Stable
Density	0.911 g/cm^3
Method of Detection and Determination:	The polymer was detected and characterised using Fourier Transform Infrared Spectroscopy and Gel Permeation Chromatography.

The polymer meets the criteria for assessment as a synthetic polymer of low concern under Regulation 4A of the *Industrial Chemicals (Notification and Assessment) Act 1989*.

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	Clear to white solid pellets or granules.
Melting Point:	121.6°C and 99°C (differential scanning calorimetry)
Density:	0.911 g/cm^3
Particle Size	Not determined. Polymer is imported in pellet or granular form.
Water Solubility:	Insoluble. No solubility test reports have been provided but insolubility is suggested from the hydrophobic nature of the chemical structure and high molecular weight.
Hydrolysis as a Function of pH:	Not determined. The polymer consists only of carbon and hydrogen atoms and contains no polar groups likely to confer solubility or become cationic. There are also no groups that are likely to hydrolyse.
Flammability:	Combustible. The polymer will burn on prolonged exposure to flame or high temperature.
Autoignition Temperature:	330°C - 410°C
Explosive Properties:	Non-explosive
Reactivity/Stability:	Not reactive under normal conditions. It can react slightly with oxidising agents, acids and alkalis.

Comments on Physico-Chemical Properties

No further comments.

4. PURITY OF THE CHEMICAL

Degree of Purity:	Not determined
Hazardous Impurities:	None

Non-hazardous Impurities

(> 1% by weight): None

Additives/Adjuvants:

Chemical name:	Crystalline silica
CAS No.:	68855-54-9
Weight percentage:	<0.5%

5. USE, VOLUME AND FORMULATION

The notified polymer is a component of an imported adhesive resin Fusabond EMB 482D. The resin will be used as an interlayer adhesive between a primer coat and polyethylene topcoat for corrosion protection of underground steel pipes.

The notified polymer will be imported at the rate of < 200 tonnes/year for the first 5 years.

6. OCCUPATIONAL EXPOSURE

Import, Transport and Storage

The notified polymer will be imported as a component at < 60% w/w of an adhesive resin Fusabond EMB 482D in 25 kg bags and transported by road or rail to two sites. The notifier has provided no data on numbers of workers involved in initial importation and transportation of the polymer. No repackaging or reformulation will occur prior to end-use and exposure of workers involved in initial import and transport will only occur following inadvertent puncture of the bags.

End-use Extrusion

Between 1 and 3 workers will be involved in the extrusion process. No further occupational exposure data have been provided by the notifier. It is likely that bags containing Fusabond EMB resin will be opened and the resin pellets fed manually into the hopper of the extruder. The extrusion process including the operating temperature will then be monitored by workers.

Electrostatic buildup may occur when decanting pellets from bags. Worker exposure to the notified polymer may occur via the skin from handling the resin in pellet form and also as a hot extrusion. At recommended processing temperatures, the hot extrusion of resin product containing the notified polymer may produce fumes containing small quantities of maleic anhydride which also may be inhaled. If the resin is overheated, more extensive decomposition and liberation of irritating carbonaceous oxide fumes may occur.

Any waste resin will be recycled by regrinding. This process may produce dusts and so occupational exposure to the notified polymer during this process may occur via the skin, eyes and lungs.

The notified has provided no details on engineering controls or personal protective equipment which will be used to control exposure to the notified polymer. However, the Material Safety

Data Sheet (MSDS) for the product containing the notified polymer advises that to control exposure, workers should wear dust/mist and organic vapour respirators, coveralls, gloves and safety glasses. To control exposure to hot resin during the extrusion process, chemical splash goggles, face shield and heat resistant coveralls and footwear should be used. In addition, forced ventilation should be used to control fumes at the extruder.

Worker exposure to the notified polymer after extrusion will not occur as the polymer will be bound within the fused matrix.

7. PUBLIC EXPOSURE

The notified polymer is not available for sale to the general public and will be used as an adhesive that binds two protective layers on the exterior of steel pipes. The potential for public exposure to the notified polymer during transport and use or from disposal is assessed as negligible. Although the public may (on rare occasions) make dermal contact with pipes coated with the product containing the notified polymer, exposure will be negligible because the product containing the notified polymer will be located beneath an overcoat.

8. ENVIRONMENTAL EXPOSURE

Release

Release of the notified polymer to the environment in the process of coating the pipes is expected to be minimal. The Fusabond EMB resin will be fed to a hopper, heated, and fed through an extruder. Clean waste products will be reground and reused. Contaminated polymer waste will be deposited to landfill or incinerated. The notifier has not attempted to quantify the amount of waste release that will occur during the coating process. Therefore, this amount has been estimated to account for approximately 0.5% of the annual import volume, based on other typical extrusion process waste releases.

Residues in the importation bags are unlikely to occur due to the granular nature of the commercial product and the bags are likely to be disposed to landfill. There is also potential for accidental release during transport but environmental risk is considered to be low because spills will be easily contained and cleaned up.

Fragments of the notified polymer may also be released as a result of the installation of the coated pipes. This form of release is expected to be site limited and minor, relative to the amount of waste generated by disposal of the product at the end of its useful life.

The majority of the notified polymer is not expected to be released to the environment until it is discarded to landfill or incinerated at the end of its useful life. The notifier is unsure as to the expected fate of the pipes coated with the notified polymer product at the end of their useful life. They are expected to ultimately be disposed to landfill or recycled by high temperature smelting which would destroy the polymer coating and produce oxides of carbon.

Fate

The majority of production waste material will be recycled in the process. Once the notified

polymer has been coated onto the pipes, the notified polymer will be incorporated in an inert matrix.

Due to the large molecular weight and the low water solubility of the polymer it is unlikely to bioaccumulate (Connell, 1989).

After end-use, the product will end up in a landfill or be incinerated. Polymer in landfill will be within an inert, stable matrix and it should not leach. Like other polyethylene products, the product containing the notified polymer will degrade very slowly (Bartha, 1997). If the pipes coated with the polymer are recycled, the polymer will be destroyed in the high temperature smelting process, producing oxides of carbon.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological data were submitted.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were submitted.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

Once the polymer has been heated and mixed with the other ingredients in the products it will be bound in an inert matrix. Faulty batches or spilled polymer will be returned to the extruding machinery and waste during the coating process is expected to be minimal, possibly less than 1 tonne/annum. However, ultimately, all of the notified polymer will end up in the environment at the end of its useful life, mostly in landfill. If some of the pipes coated with the polymer are recycled it should be destroyed in the smelting process producing oxides of carbon.

Disposal of the notified polymer to landfill, either in pellet form or as finished product, is unlikely to present a hazard to the environment. The notified polymer is insoluble and therefore is expected to be immobile within landfill sites. Bioconcentration and degradation are considered to be unlikely, due to the high molecular weight, inert form and insolubility of the polymer.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Hazard Assessment

No toxicological data were provided for the notified polymer and so the polymer cannot be classified according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999a). However, the high molecular weight and low content of low molecular weight species indicate that the polymer would be poorly absorbed across biological membranes. Moreover, the low residual monomer content

and lack of reactive functional groups indicate that the notified polymer would be of low toxicity.

Occupational Health and Safety

Workers will handle the notified polymer in the imported Fusabond EMB resin at < 60% during import and transport and end-use extrusion coating of steel pipes. For workers involved in import and initial transport, dermal contact will be the main route for exposure when handling the notified polymer and will only occur as a result of accidental puncture of the bags. Therefore, the health risk for these workers would be considered low.

For workers involved in end-use extrusion processing, there is the possibility of dermal exposure to the notified polymer in neat as well as molten product. Also, inhalational exposure to polymer dust during grinding of resin for recycling and dust and fumes evolved from the extrusion process may occur. However, due to the anticipated low toxicity of the notified polymer, the health risk during these activities is considered low.

The MSDS for the product containing the notified polymer warns that the extrusion process using the product may liberate maleic anhydride vapours and exposure may be associated with skin, eye and respiratory irritation. Maleic anhydride is also a respiratory sensitiser (National Occupational Health and Safety Commission, 1999b). Furthermore, the MSDS for the product also warns that overtemperature conditions > 290°C may produce more extensive decomposition and liberation of additional irritating carbonaceous oxide fumes.

Therefore, temperature control of the extrusion process must be carefully monitored to prevent product decomposition and local forced ventilation should be provided to control any liberated fumes. If exposure limits cannot be guaranteed, dust/mist/organic vapour respirators should be used to control inhalation exposure to the polymer, product vapours such as maleic anhydride and decomposition products. Workers involved in the extrusion process should be further protected against molten resin spillage by chemical splash goggles, face shield and heat resistant coveralls and footwear.

Pouring pellets may produce electrostatic buildup. Electrical grounding of equipment is recommended. Also, spilt resin pellets may represent a slipping hazard and so resin pellets should be cleaned up immediately.

After the extrusion process has been completed, the polymer will be bound within a fused matrix and not available for exposure or uptake. Therefore, the health risk for workers handling coated pipes is low.

Public Health

The notified polymer is not available for sale to the general public. Although members of the public may make dermal contact with coatings containing the notified polymer, exposure will be negligible because of the high molecular weight of the polymer and location of the product containing the notified polymer beneath an overcoat layer. Therefore, the notified polymer is not considered to pose a significant public health risk.

13. RECOMMENDATIONS

To minimise occupational exposure to Sclair 10A, the following guidelines and precautions should be observed:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 (Standards Australia, 1994) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); industrial clothing should conform to the specifications detailed in AS 2919 (Standards Australia, 1987) and AS 3765.2 (Standards Australia, 1990); impermeable gloves or mittens should conform to AS 2161 (Standards Australia/Standards New Zealand, 1998); all occupational footwear should conform to AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994);

- Forced local ventilation must be employed at extrusion machinery to control fumes liberated by the heating process;

- Spillage of the notified polymer should be avoided. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;

- Good personal hygiene should be practised to minimise the potential for ingestion;

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

If products containing the notified polymer are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999a), workplace practices and control procedures consistent with State and territory hazardous substances regulations must be in operation.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (National Occupational Health and Safety Commission, 1994).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under section 65 of the Act, secondary notification may be required if the polymer characteristics cease to satisfy the criteria under which it has been accepted as a Synthetic Polymer of Low Concern. Secondary notification of the notified polymer may be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

16. REFERENCES

Bartha R, Yabannavar AV, Cole MA, and Hamilton JD (1997) Plastics. In: Hamilton J.D and Sutcliffe R (Eds): Ecological Assessment of Polymers: Van Nostrand Reinhold.

Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: D. W. Connell ed. Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton.

National Occupational Health and Safety Commission (1994) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. Canberra, Australian Government Publishing Service.

National Occupational Health and Safety Commission (1999a) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. Canberra, Australian Government Publishing Service.

National Occupational Health and Safety Commission (1999b) List of Designated Hazardous Substances [NOHSC:10005(1999)]. Canberra, Australian Government Publishing Service.

Standards Australia (1987) Australian Standard 2919-1987, Industrial Clothing. Sydney, Standards Association of Australia.

Standards Australia (1990) Australian Standard 3765.2-1990, Clothing for Protection against Hazardous Chemicals Part 2 Limited protection against specific chemicals. Sydney, Standards Association of Australia.

Standards Australia (1994) Australian Standard 1336-1994, Eye protection in the Industrial Environment. Sydney, Standards Association of Australia.

Standards Australia/Standards New Zealand (1992) Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications. Sydney/Wellington, Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994) Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. Sydney/Wellington, Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Sydney, Standards Association of Australia.