File No: PLC/21

Date: June 1996

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

PR-K-I-E

1. APPLICANT

Shell Chemicals (Australasia) Trading Pty Ltd of 1 Spring Street MELBOURNE VIC 3000 has submitted a polymer of low concern notification statement in support of their application for an assessment certificate for PR-K-I-E.

2. IDENTITY OF THE POLYMER

Based on the nature of the chemical and the data provided, PR-K-I-E is not considered to be hazardous. Therefore, the chemical name, CAS number, chemical formula, chemical structure and other information describing the chemical composition of the polymer well as quantities in formulations have been exempted from publication in the Full Public Report

Trade name: PR-K-I-E

Method of Detection and Determination: The polymer can be separated by gel permeation chromatography and identified by fourier transformed infra-red spectroscopy

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa: clear amber liquid

Melting Point/Glass-transition Temperature: not applicable

Density:	940 kg/m^3 at 20°C
Water Solubility:	120 ppm at 22°C
Hydrolysis as a Function of pH:	not determined
Flammability Limits:	not applicable
Autoignition Temperature:	330°C
Explosive Properties:	none
Decomposition Temperature:	191°C
Reactivity:	reacts with strong oxidising agents
Particle Size Distribution:	not applicable

Comments on Physico-Chemical Properties

The notified substance is a non-ionic surface active agent whose function is to break any emulsion of diesel fuel and water. The ability of the notified substance to form an association with water and organic solvents is a requirement of use. This may explain the higher than expected solubility in water.

4. PURITY OF THE CHEMICAL

Maximum weight-percentage of residual monomers: < 0.21

5. INDUSTRIAL USE

The notified polymer is an anti-emulsifying agent. It is a component of the product NALCO 7D-07 which in turn is used as a component of the Shell fuel additive SAP 7022, forming part of the formulation of a diesel fuel detergent additive package. Final concentration of PR-K-I-E in the diesel fuel will be 5 - 10 ppm. The notified polymer has been used in Europe for twenty five years.

The formulated fuel additive containing the notified polymer (0.35% active) will be imported at a rate of > 1 tonne for the first five years.

6. OCCUPATIONAL EXPOSURE

The containers are transported by road to a distribution terminal where the notified polymer is pumped through a pipe to a single storage facility. During this process

one surveyor, two chemists and four storage terminal workers will be exposed to the notified polymer. The notified polymer is transported either by road or rail to depots throughout the country, where ten vehicle operators and twenty depot workers will be exposed to the notified polymer. It is then applied to diesel fuel at a rate of 5 - 10 ppm by continuous injection via an automated closed system. During this operation fifty skilled oil-industry operators will be exposed to the notiified polymer.

7. PUBLIC EXPOSURE

The detergent additive package containing the notified polymer will not be sold to the public, and the only exposure of the public will be during the handling or combustion of diesel fuels containing it.

8. ENVIRONMENTAL EXPOSURE

Release

The import of the formulated fuel additive package containing the notified substance will be by bulk tanker with transfer by pump through pipe to a bulk holding facility within the refinery precincts. Transfer to and mixing with the diesel fuel is again by pipe to the automatic injection equipment. The diesel fuel is stored and transported to the end user in the normal distribution process using road tankers and on site storage tanks. Release to the environment in the confines of the refinery would involve containment in bunded areas and cleanup procedures that are well rehearsed and comprehensive. In the final use product the polymer is at low concentration and precautions are similar to those required for the storage, handling and use of diesel fuel. Any environmental releases during normal use would be expected to be minimal.

Fate

Recovery or recycling of the spilled fuel additive containing the notified substance is recommended. Contaminated product is to be incinerated.

The final fate of the polymer is incineration in the combustion chamber of the engine or furnace. Thermal decomposition of PR-K-I-E begins at 191.05°C. Since fuel is injected into diesel engine combustion chambers typically operating at temperatures of 427 - 627°C, PR-K-I-E will be largely combusted to constituent oxides of carbon and hydrogen and expelled to the environment through the exhaust system.

9. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for polymers of number-average molecular weight (NAMW) > 1000 according to the Act. The notifier expects PR-K-I-E to be of insignificant toxicity to aquatic organisms and not to be readily biodegradable.

10. ASSESSMENT OF ENVIRONMENTAL HAZARD

The hazard to the environment is limited by the low concentration in diesel fuel (5 - 10 ppm) and lack of release to the environment until incineration in the combustion chamber of the engine and final release as part of the exhaust gases. The material safety data sheet (MSDS) for NALCO 7D-07 (containing 35% PR-K-I-E) contains no information on the environmental toxicity of the product, whereas the MSDS for SAP 7022 (containing 0.35% PR-K-I-E) estimates the end product is very toxic to fish, daphnia, algae and organisms in sewage treatment plants due to other chemicals in the mixture.

11. ASSESSMENT OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY EFFECTS

PR-K-I-E has been notified as a synthetic polymer of low concern under section 23 for the purpose of section 24A of the Act. The polymer meets the criteria for a synthetic polymer of low concern specified in regulation 4A of the Act and therefore is considered of low hazard to human health.

The notified polymer has a NAMW > 1000 and, as such, is not expected to cross biological membranes. Considering the above and the low level of the notified polymer in the imported additive package adverse health effects would not be expected to result from exposure to the package. However, the MSDS states the product containing the polymer is an eye and a skin irritant. This is attributed to the hazardous ingredients in the product.

The polymer would not be classified as a hazardous substance on the basis of the levels of residual monomers in the additive package.

Exposure of workers to the polymer during wharf handling and transportation is expected to be minimal other than in the event of a spill. Exposure during formulation is minimised by the use of an automated and enclosed injection system used in introducing the polymer to diesel fuel.

The low expected intrinsic toxicity of the polymer and low exposure suggests that the occupational health risk is minimal. However, the MSDS for the product, carries exposure standards (1) for ingredients trimethyl benzene and toluene, which are toxic via skin, eye and inhalation routes. Therefore, eye and skin contact, as well as inhalation of the product should be avoided.

The public will not be exposed to the notified polymer during its importation, application or use as a diesel detergent additive package.

There may be potential for public exposure to the notified polymer or to its combustion products in diesel fuels. No information is available on the identity or toxicological properties of combustion products of the polymer. However, the properties of the notified polymer suggest that should exposure occur absorption is

unlikely, and this, together with the very low concentrations present in the fuels, suggest that there would be low risk to public health.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of PR-K-I-E shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

12. RECOMMENDATIONS

To minimise occupational exposure to the notified polymer the following guidelines and precautions should be observed:

- if engineering controls and work practices are insufficient to reduce exposure to a safe level, then personal protective equipment which conforms to Australian Standards (AS) or Australian/New Zealand Standard (AS/NZS) should be worn;

  safety goggles should be selected and fitted in accordance to AS 1336 (2) to comply with AS/NZS 1337 (3),

  impermeable gloves or mittens conforming to AS 2161 (4) ,

  Industrial clothing must conform to the specifications detailed in AS 2919 (5),

  all occupational footwear should conform to AS/NZS 2210 (6) also should be worn;

- good work practices should be implemented to avoid spillages and splashing;

- good housekeeping and maintenance should be practised. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal in accordance with Local or State government regulations;

- good personal hygiene should be observed; and

- copies of the MSDS should be easily accessible to employees.

13. MATERIAL SAFETY DATA SHEET

The attached MSDS for NALCO 7D-07 containing 35% of the notified polymer and SAP 7022 (fuel additive package) containing 0.35% of the notified polymer were provided in accordance with the *Code of Practice for the Preparation of a Material Safety Data Sheets* (7).

These MSDS were provided by the applicant as part of their notification statement. The accuracy of this information remains the responsibility of the applicant.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of PR-K-I-E shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

15. REFERENCES

1. *Exposure Standards for Atmospheric Contaminants in the Occupational Environment, National Exposure Standards, [NOHSC:1003 (1991)],* 2nd Edition, October 1991.

2. Standards Australia, 1994, *Australian Standard 1336-1994, Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, Australia.

3. Standards Australia/Standard New Zealand 1992, *Australia/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, Standards Association of New Zealand Publ, Wellington.

4. Standards Australia, 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves*), Standards Association of Australia Publ., Sydney, Australia.

5. Standards Australia, 1987, *Australian Standard 2919 - 1987 Industrial Clothing,* Standards Association of Australia Publ., Sydney, Australia.

6. Standards Australia/Standards New Zealand 1994, *Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear,* Standards Association of Australia Publ., Sydney, Standards Association of New Zealand Publ, Wellington.

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