

File No PLC/476

14 October 2004

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME
(NICNAS)**

FULL PUBLIC REPORT

LSL-50R

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, Water, Heritage and the Arts.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full 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
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LSL-50R

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Rheochem Ltd of 11 Alacrity Place, Henderson WA 6166

NOTIFICATION CATEGORY

Polymer of Low Concern

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 and Monomer Residuals.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

CEC/621 by Rheochem Ltd

NOTIFICATION IN OTHER COUNTRIES

Canada, Korea, USA and Japan

2. IDENTITY OF CHEMICAL

OTHER NAME(S)

Substituted styrene acrylate copolymer (pre-crosslinked)

MARKETING NAME(S)

LSL-50R

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

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

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	15	30	30	30	30

USE

Drilling fluid additive in a synthetic based drilling fluid system

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will be imported in powder form (100% concentration) in multilayer bags, wrapped on non-returnable wooden pallets and stored undercover at Rheochem warehouse in Western Australia. At this site, the notified polymer is mixed with other ingredients to produce a mixed fluid which will be transported to an offshore drilling rig for use as a drilling mud in oil and gas production.

At the customer's site, sacks of powder are placed next to the mixing hopper and cut open. The powder is slowly released into the hopper over a period of 15-20 minutes and mixed with other ingredients for incorporation into a final fluid containing approximately 0.5% of the notified polymer. The mixed fluid is then transported by sea to the offshore drilling rig, where it is stored in bulk tanks. During drilling operations, the mud is pumped down the drill shaft, acting as a lubricant for the drills, and also as a carrier fluid for removing the solid cuttings. The drilling operation is a closed recirculated system.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

The notified polymer will not be manufactured in Australia. Release of the polymer during transport (for example, due to a ripped bag) is expected to be limited to 1 to 2 kg. Strategically placed booms and environmental spill kits are at the notifier's facility where the notified polymer is mixed into the drilling fluid. Automatic sumps connected to the waste tanks are also placed inside the bunded mixing area to dispose of any spilled material.

The notifier estimates that less than 0.002% (0.6 kg based on the maximum import volume) of the notified polymer will be left in empty bags as residue. These bags are generally not cleaned or wiped out individually due to the high volume used. The empty bags are collected by a waste contractor and disposed of at regulated waste disposal sites.

The drilling fluid normally contains about 0.5% w/w of the notified polymer. It is indicated that higher levels are prohibited due to usage limitations including desired fluid properties and cost.

During drilling operations, the mud is pumped down the drill shaft and functions as a lubricant for the drills, and also acts as a carrier fluid for removing the solid cuttings (ie the rock removed from the bore hole). The "mud" is pumped down the centre of the (hollow) drilling rods and is extruded through holes in the cutting head, which is of larger bore than the shaft of drill rods. The mud then fills the annular region between the bore hole, which is typically 31.1 cm in diameter (Cobby and Craddock 1999), and the drilling shaft. As the mud is pushed back towards the surface it carries the drill cuttings with it. The bore hole is cased and fitted with appropriate valves and plumbing to allow for the return of the mud and cuttings back to the drilling platform. The solid cuttings are then separated from the fluid mud through a series of shaker and filtration units and automatically dumped overboard, while the mud itself is returned to the storage tank for reuse.

At the offshore rig site, solids are separated from the liquid using four shale shaker units (twin deck, vibrating screens) and two centrifuge units. The oil content on cuttings/solids is monitored daily during the drilling (average oil content of 9 to 10% w/w). The notifier's best estimate of the amount of the notified polymer remaining in the cuttings is 0.05% w/w (15 kg based on the maximum import volume). This estimate is based on the assumption that the notified polymer is 100% dispersed in the oil and is part of the oil fraction that absorbs onto cuttings. The operator of the current project has permission to discharge the solid cuttings overboard at the current rig site.

The liquid mud separated from the cuttings is returned from the rig to the notifier's liquid handling facility, where it is diluted and rebled with new volume to prepare the drilling fluid. Any solids removed from the mud at this facility via centrifuging are sent to a thermal desorption plant to be incinerated. As the liquid mud containing the notified polymer is reused, most of the imported polymer will eventually be released to the marine environment sorbed to the solid cuttings.

The notified polymer contains ester linkages that could undergo hydrolysis under extreme pH conditions. However, significant hydrolysis is unlikely to occur in the environmental pH range of 4 to 9. Any of the notified polymer released to the environment is likely to adsorb strongly to solid cuttings and sediment.

6.2. Summary of Occupational Exposure

Transport and Storage

During transport of the notified polymer, workers may be exposed to the notified polymer if sacks containing the polymer are accidentally breached. Contact with the powder would be primarily dermal as the mean particle size of the polymer is above the inspirable range (180 microns).

Formulation

At the customer's site, skin contact with the notified polymer (in powder form) may occur during cutting of the sacks and addition of the polymer to the hopper on the mixing vessel. Exposure would be approximately one hour on 10-20 days per year. Exposure to the polymer in the final mixed fluid would be low as the concentration of the notified polymer is less than 0.5%.

Tender Barge Handlers

Mixed fluid containing the notified polymer is transported by sea to the drilling rig approximately 10 times per year. Exposure by the boat handlers is unlikely as the fluid is packaged throughout the operation.

Rigsite Workers

As the drilling mud containing the notified polymer is used in a closed system, there is little opportunity for exposure by the rigsite worker. Moreover, the drilling mud contains less than 0.5% notified polymer.

6.3. Summary of Public Exposure

The notified polymer is intended only for use in industry with little opportunity for exposure by the public.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Powder sieved through a 1 mm screen
Melting Point/Glass Transition Temp	61°C
Density	1.03 kg/m ³
Water Solubility	Not determined. The notifier considers the notified polymer to be insoluble in water due to the nature of its manufacturing process.
Dissociation Constant	The low solubility is consistent with the hydrophobic nature of the molecule. Not determined. The notified polymer has no groups that can dissociate.
Reactivity	Stable
Particle Size	Mean 300 µm, 0.3% < 10µm

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

The product MSDS provides the following information:
Oral LD50 in rat: > 5000 mg/kg

The results was indicative of low acute hazard.

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**

The following toxicological studies were submitted.

<i>Endpoint</i>	<i>Result and Conclusion</i>
Ready Biodegradability* (WRc 1993a)	Not biodegradable.
Fish Toxicity* (Inveresk 2001) Juvenile Turbot (<i>Scophthalmus maximus</i>)	96 hour LC50 = 3486 mg/L (nominal) (95% Confidence interval 2243-5873 mg/L)
Crustacean Toxicity* (WRc 1993b) Copepod (<i>Acartia tonsa</i>)	48 hour EC50 > 33,000 mg/L (WAF [#])
Amphipod Toxicity** (WRc 1993c) Mud Shrimp (<i>Corophium volutator</i>)	10 day EC50 > 105,000 mg/kg dry weight of sediment
Algal Toxicity* (WRc 1993d) Marine Alga (<i>Skeletonema costatum</i>)	EC50 = 48,991 mg/L (WSF ^{##}) (95% Confidence interval 32,485-65,497 mg/L)

* Tested in seawater. Test concentrations were not verified.

** Exposed to treated sediment in seawater. Sediment amended with the test substance was not analysed.

Water accommodated fraction (contained some undissolved test substance and was not filtered or centrifuged).

Water soluble fraction (filtered to remove undissolved test substance).

9.1.1. Discussion of observed effects**9.1.1.1 Biodegradability**

The biodegradability of the test substance was determined according to the OECD draft guideline 306, which is preferred for testing biodegradability in seawater under the Paris Commission's Notification Scheme for Offshore Chemicals. The study assessed the 28 day biochemical oxygen demand (BOD) in seawater.

Surface seawater collected was analysed for dissolved ammonium (≤ 0.10 mg NH₃-N/L), nitrate (≤ 0.10 mg NO₃⁻-N/L), total phosphorous (0.05 mg P/L), dissolved organic carbon (DOC 3.9 mg C/L), salinity (29.9‰) and heterotrophic micro-organisms (1580 CFU/mL).

The seawater was not inoculated and degradation relied upon on the indigenous micro-organism population. The test substance (3.2±0.5 mg) and the reference stock solution (0.1929 g sodium benzoate in 100 mL distilled water) were added to BOD bottles and filled with aerated and filtered seawater fortified with mineral salt supplements. These were incubated (15.0 to 15.6°C) along with the blank controls filled with seawater only.

Any possible interference of chloride was suppressed by using the small scale open and closed tube digestion procedure to prevent false oxygen demand data, which can cause erroneously high results in the COD results (thus under estimating biodegradation). The efficacy of the treatment for suppressing chloride interference was also checked in two ways.

The COD results varied in a fairly wide range. This variation was attributed to the lack of homogeneity of particle size or uneven distribution of the test substance in the suspension of seawater, or failure of the test substance to oxidise evenly in all COD samples. Degradation of the reference substance (>50% by day 5 and >70% by day 28) validated the test conditions and demonstrated that the heterotrophic bacterial population was satisfactory. Despite the fortification of seawater the test substance failed to degrade under the conditions of the study. Therefore, it is unlikely to undergo biodegradation in the natural marine environment.

Test facility: WRc (1993a).

9.1.1.2 Fish Toxicity

The fish toxicity study was conducted under semi-static conditions according to the OECD Guidelines 203 modified at the PARCOM Workshop, Kent in 1993 for marine fish. The marine fish Turbot (*Scophthalmus maximus*) was used as the test species.

Based on the results of a range finding test, the definitive test concentrations of 0, 625, 1250, 2500, 5000 and 10,000 mg/L were used. A weighed amount of the test substance was added to artificial seawater and batches of about 800 mL of this aqueous media were ultrasonicated for about 10 to 15 minutes. The ultrasonicated media were then added to the appropriate test vessel to give a total volume of 10 L of test water.

The pH (8.2-8.5), dissolved oxygen (80-90% of air saturation values, ASV), salinity (32-33‰) and temperature (14.5-15.6°C) were measured at the start and at 24 hour intervals (before and following each media renewal). The test concentrations were not analysed. Seven juvenile turbot fish were placed in each test and the control vessels.

Although the test substance is claimed to be insoluble in water, the test concentrations used were considerably high. The test solutions remained white and opaque throughout the study. The LC50 was 3486 mg/L (nominal) with a 95% Confidence interval of 2243-5873 mg/L after 96 hours. The test substance thus shows some toxicity to marine fish above the limit of its water solubility, which may be due to physical effects caused by the opaque solution.

Test facility: Inveresk (2001).

9.1.1.3 Aquatic Invertebrate Toxicity

The invertebrate toxicity study was conducted according to a draft protocol based upon ISO TC147/SC5/WG2 protocol titled "Water Quality: Determination of acute lethal toxicity to marine copepods (Copepoda, Crustacea) under static conditions". The marine copepod *Acartia tonsa* was used as the test species.

The stock solutions were prepared by adding the appropriate weight of the test substance to 500 mL flasks and topping up to 200 mL with reference seawater. The flasks were covered and shaken for 16 hours (100 rpm at 20±2°C). After allowing to stand for one hour, four 25 mL volumes of these solutions were removed from a central position of each flask and pipetted into four 250 mL beakers for each test concentration. The test solutions therefore are water accommodated fractions (WAF), which were not all in solution as they contained some undissolved test substance and had not been filtered or centrifuged.

The nominal test loading rates were 0, 330, 1000, 3300, 10,000 and 33,000 mg/L. The test concentrations were not verified. The test organisms could be seen relatively easily when the vessels were placed on a dark surface and illuminated from above. At the higher loading rates some of the test substance was present in suspension. Since most of this material floated and the acartia tended to stay near the bottom of the vessels sometimes it was necessary to view them from the bottom of the vessels.

The pH (7.99-8.26), dissolved oxygen (94-104% of air saturation values, ASV), temperature(19.8-

20.5°C) and salinity (35-37‰) were measured prior to addition of test organisms in to the vessels and after 48 hours of exposure. There were no mortalities in any of the test vessels after 24 hours and the mean percent of survival in the 33,000 mg/L vessel was 65% while 90% of the acartia in the control replicate survived the 48 hour test duration. Therefore, the 48 hour EC50 value can be considered to be greater than 33,000 mg/L (WAF). The test substance thus shows some toxicity to marine aquatic invertebrates above the limit of its water solubility. Again this may be a physical effect.

Test facility: WRc (1993b).

9.1.1.4 Amphipod Sediment Phase Toxicity

The sediment phase study was conducted according to a draft PARCOM ring-test protocol issued by the Ministry of Agriculture, Fisheries and Food in December 1992. A solid-phase sediment toxicity test was conducted exposing the sediment reworker *Corophium volutator* for 10 days to the test substance.

Sediment obtained from Newton Bay, Dorset was sieved (1.5 kg wet weight) and the appropriate weight of the test substance were added into each of six 2 L beakers and stirred. A food blender was used to homogenise the mixture for 2 minutes. The homogeneity of incorporation of the test substance into the sediment could not be assessed. A small amount of the test substance was observed on the sides of the test vessels but was considered to have resulted in less than 5% loss of test substance from the sediments. The sediment was divided and added to five 1 L beakers (~300 g each). Polyethylene discs were placed over the sediment surfaces and the beakers were topped-up with filtered (0.45 µm) seawater to the 800 mL mark. The discs were carefully removed and the contents of the beakers were allowed to settle overnight (at 15±1°C). The amphipods were transferred into beakers (ten per beaker) each containing 50 mL of reference seawater and poured into randomly positioned test vessels.

The methods of mixing the test substance into sediment and transferring the amphipods differed from those suggested in the protocol. However, previous experience had shown to the methods used in the study to cause less disturbance to the sediment and to be more effective with substances that are less dense than seawater and poorly soluble in water.

Five nominal loading rates of 0, 318, 3180, 10,500, 31,800 and 105,000 mg/kg (dry weight) of sediment were tested. Five replicates were tested each treatment and the control. The artificial seawater overlying the sediment was maintained at a constant volume with the addition of distilled water. The seawater was gently aerated constantly.

Temperature (13.2-16.5°C), pH (7.75-8.32), salinity (28-37‰) and dissolved oxygen (68-109% ASV) were measured prior to addition of test organisms and at 24 hour intervals during the test period. At the end of the test the sediment was resuspended and sieved. The number of living, dead and missing animals was recorded. Death was defined as the absence of movement. The missing animals were assumed to have died and decomposed during the test but may also have been due to less than 10 animals being placed in a vessel at test initiation or lost during sieving.

The burrowing activity of the amphipod did not cause much separation of the test substance from the sediment but about 5% of the original amount added could be seen floating on the surface in the vessels with the highest four nominal loading rates. The behaviour of test organisms exposed to the test substance was not different to that of the controls.

The mean percent of survival was 90% in the highest loading rate of 105,000 mg/kg dry weight of sediment and 88% in the control during the 10 day exposure period. Therefore, the 10 day LC50 can be considered to be greater than 105,000 mg/kg dry weight of sediment (nominal). The test substance is thus practically non-toxic to the marine amphipod *Corophium volutator* when contained in the sediment.

Test facility: WRc (1993c).

9.1.1.5 Algal Growth Inhibition Test

The algal growth inhibition test was carried out according to a draft PARCOM ring-test protocol based

on ISO method (1998). Water Quality Marine algae growth inhibition test with *Skeletonema costatum* and *Phaeodactylum tricornutum*. (ISO/TC 147/SC5/WG5) – Static.

Test concentrations were prepared by mixing the required weights of test substance with 1-1 volumes of sterilised nutrient enriched seawater and agitating (20 hours). From each vessel 900 mL were siphoned out and filtered (0.2 µm) to remove any undissolved test substance to obtain the water soluble fraction (WSF). Two hundred mL of each were added to test vessels (4 replicates each) and quadruplicate controls with nutrient enriched seawater were also tested. The nominal concentrations (as WSF) tested were 0, 1,000, 3,300, 10,000, 33,000 and 100,000 mg/L. The test concentrations were not verified. The marine alga *Skeletonema costatum* was used as the test species.

Temperature (20-21°C), pH (7.69-8.20), salinity (34-36‰) and dissolved oxygen (95-98% ASV) were measured at the beginning and end of the test. The variation in pH at each test concentration was less than 1 pH unit.

The estimates of algal growth derived using three techniques (manual, Coulter Counter and Photometric absorbance) varied greatly. Particle density measurements (Coulter Counter and manual) of algal cells indicated reduced growth at all test concentrations. However, after 72 hours of exposure, the highest two concentrations showed a greater effect (with almost clear solutions) than the controls and the lower concentrations (brown coloured solutions). Cell density measurements by photometric absorbance showed similar growth in the control and the three lowest concentrations but significant growth reduction in the two highest concentrations (confirmed by statistical analysis using the Dunnett's Test).

These discrepancies in cell density measurements were attributed to the fact that the Coulter Counter Method did not assess algal growth adequately as it measured the particle density but did not allow for the size of the particles. The absorbance and manual counting techniques were noted to be more useful as they allowed measuring growth including the increase in both the particle (chain) numbers and the number of cells within each particle.

Statistical analysis of the absorbance measurements indicated an ErC50 value of 48,991 mg/L (95% confidence interval of 32,485 to 65,497 mg/L). The test substance thus shows some toxicity to marine algae upto the limit of its water solubility.

Test facility: WRc (1993d).

9.2. Environmental Hazard Assessment

According to the above ecotoxicology test results the notified polymer shows some toxicity to marine fish and aquatic invertebrates above the limit of its water solubility, which may be due to physical effects caused by the opaque solution or undissolved test substance. The test substance also shows some toxicity to marine algae up to the limit of its water solubility but was practically non-toxic to the marine amphipod *Corophium volutator* when contained in the sediment.

The polymer with its insolubility in water and poor biodegradability has a higher potential for bioaccumulation in exposed organisms. However, the high molecular weight suggests that the chemical is not likely to diffuse across biological membranes and therefore bioaccumulate.

10. RISK ASSESSMENT

10.1. Environment

Less than 0.6 kg (based on the maximum import volume) of the notified polymer is expected to be left as residue in empty import bags, which will be disposed of by an authorised waste contractor. Notified polymer contained in the solids removed from used mud at the liquid handling facility will be destroyed releasing water vapour and oxides of carbon when incinerated at a thermal desorption plant.

The main environmental exposure is expected to result from the notified polymer remaining in the cuttings discharged overboard at the current rig site. The amount of the notified polymer

expected to remain in the cuttings discharged is 0.05% w/w (15 kg based on the maximum import volume). However, the liquid mud separated from the cuttings is reblended to prepare the drilling fluid for reuse. As the liquid mud is reused, most of the imported notified polymer could be expected to be eventually released to the marine environment.

Currently, only one rig site is identified as a user facility, which could eventually release up to 30 tonnes of the notified polymer each year. The solid cuttings containing the notified polymer are likely to form piles on the sea floor under the drilling platform. During the operational life of the platform, the discharged cuttings may remain in a mound directly under the platform, relatively shielded by the platform itself from the dispersive effects of marine storms and currents. However, this protection can be expected to be removed once the platform is decommissioned allowing the mounds of cuttings and the notified polymer to disperse in a much wider area of the sea floor. A small quantity of the polymer may form a 'slick' on the water surface after release in calm sea conditions. However, most of the polymer would become associated with benthic sediments.

Most of the imported notified polymer could be expected to be eventually released to the marine environment with the reuse of liquid mud. The notified polymer is not readily biodegradable. Further, degradation due to abiotic and biotic processes can be expected to be very slow considering the conditions in the piles of drill cuttings, including low temperatures and low density of bacteria.

Ecotoxicology test results have established that the notified polymer shows some toxicity to marine fish and aquatic invertebrates above the limit of its water solubility, which may be due to physical effects caused by the opaque solution or undissolved test substance. The test substance also shows some toxicity to marine algae up to the limit of its water solubility but was practically non-toxic to benthic organisms when contained in marine sediment.

The drill cuttings may contain up to 0.05% of the new polymer (i.e. 500 mg/kg). The amphipod toxicity test result of 10 day EC₅₀ > 105,000 mg/kg dry weight of sediment indicates that the polymer will not pose a hazard to benthic organisms at the level it is present in the piles of cuttings. However, the concentration of the notified polymer in the immediate area around the platform can be expected to increase over time. It should be also noted that the physical, chemical and biological processes that occur in these cutting deposits are not well understood.

10.2. Occupational Health and Safety

The OHS risk presented by the notified polymer is expected to be low due to its overall low toxicity and low potential for exposure during formulation of the mixed fluid and use of the mud during drilling operations. As the notified polymer is handled as a powder prior to formulation, the level of total (nuisance) dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m³ TWA.

10.3. Public Health

As the notified polymer will be used in an industrial setting only, the health risk to the public from exposure to the notified polymer is considered very low.

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

11.1. Environmental Risk Assessment

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

11.2. Human Health Risk Assessment

11.2.1. Occupational health and safety

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

11.2.2. Public health

There is Negligible Concern to public health when used in the proposed manner.

12. MATERIAL SAFETY DATA SHEET

12.1. 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.

13. RECOMMENDATIONS

REGULATORY CONTROLS

Environment

- Advise and send report to relevant State and Territory authorities.

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 should be easily accessible to employees.
- If products and mixtures containing the notified polymer are 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

Disposal

- The notified polymer should be disposed of according to the State and Local regulations dealing with non-hazardous chemical waste. Recycle if possible.
- Empty import bags with residues containing the notified polymer should be collected by a waste contractor and disposed of at a regulated site.

Emergency procedures

- Spills/release of the notified polymer should be handled by sweeping up into a waste container, keeping dust to a minimum.

13.1. 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.
 - the import volume rise above the proposed volume, the method of use changes leading to a more significant release to the marine environment and/or additional information becomes available on adverse environmental effects of the notified polymer.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

14. BIBLIOGRAPHY

- Cobby GL and Craddock RJ (1999) Western Australian Government Decision Making Criteria Involved in the Regulation of Drilling Fluids Offshore. Australian Petroleum Production & Exploration Association 39(1), pp 600-605.
- Inveresk (2001) Determination of Acute Toxicity (LC50) to Turbot, *Scophthalmus maximus* (96h, Semi-Static). (Project No. 399354, 7 February 2001) Inveresk Research, Tranent, EH33 2NE, UK.
- WRc (1993a) Assessment of Biodegradability in Seawater. (Study No. NCOM/92/22, 21 September 1993) WRc plc, Buckinghamshire, SL7 2HD, UK.
- WRc (1993b) The Acute Toxicity of the Resin to the Copepod *Acartia tons* After a 48-Hour Exposure Period (Study No. NCOM/93/11, 19 September 1993) WRc plc, Buckinghamshire, SL7 2HD, UK.
- WRc (1993c) The Acute Toxicity of the Resin (Incorporated into Sediment) to the Amphipod *Corophium volutator* After a 10 day Exposure Period (Study No. NCOM/92/37, 19 September 1993) WRc plc, Buckinghamshire, SL7 2HD, UK.
- WRc (1993d) The Acute Toxicity of the Resin to the Marine Alga *Skeletonema costatum* (Study No. NCOM/93/16, 21 September 1993) WRc plc, Buckinghamshire, SL7 2HD, UK.