File No: STD/1502

April 2014

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

UCON™ OSP Lubricant Series

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 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.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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:

Street Address:	Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, 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

TABLE OF CONTENTS

SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
STD/1502	Rohm and Haas Australia Pty Ltd Dow Chemical (Australia) Limited Afton Chemical Asia Pacific LLC Shell Company of Australia	UCON™ OSP Lubricant Series	ND*	≤ 50 tonnes per annum	Base component or additive for lubricant oils and greases

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available information, the notified polymer is not recommended for classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Human health risk assessment
Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

Environmental risk assessment
On the basis of the reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

REGULATORY CONTROLS

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer during reformulation:
  - Enclosed, automated processes, where possible
  - Adequate local ventilation

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
  - Avoid skin and eye contact
  - Avoid inhalation of aerosols/mists

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the (M)SDS should be easily accessible to employees.

- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Disposal

- The notified polymer should be disposed of in accordance with local regulations for recycling, re-use or recovery.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

Regulatory Obligations

Secondary Notification
This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(2) of the Act; if
  - the function or use of the polymer has changed from a base component or additive for lubricant oils and greases, or is likely to change significantly;
  - the amount of polymer being introduced has increased, or is likely to increase, significantly;
  - the polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

(Material) Safety Data Sheet
The (M)SDS of the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Rohm and Haas Australia Pty Ltd (ABN: 29 004 513 188)
4th Floor, 969 Burke Road
CAMBERWELL VIC 3124

Dow Chemical (Australia) Limited (ABN: 72 000 264 979)
541-583 Kororoit Creek Road
ALTONA VIC 3018

Afton Chemical Asia Pacific LLC (ABN: 99 109 644 288)
Level 9, 20 Berry Street
NORTH SYDNEY NSW 2059

Shell Company of Australia (ABN: 46 004 610 459)
8 Redfern Road
HAWTHORNE EAST VIC 3123

NOTIFICATION CATEGORY
Standard: Synthetic polymer with Mn < 1000 Da (more than 1 tonne per year).

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, analytical data, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, use detail, import volume and analogue details.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed for all physical-chemical properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
USA (2010)
China (2010)
Philippines (2010)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
UCON™ OSP Lubricant Series including:
UCON™ OSP-32 Lubricant
UCON™ OSP-46 Lubricant
UCON™ OSP-68 Lubricant
UCON™ OSP-150 Lubricant
UCON™ OSP-220 Lubricant

MOLECULAR WEIGHT
> 500 Da

ANALYTICAL DATA
Reference NMR, IR, GPC and HPLC/ESI-MS spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
> 99%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: colourless to yellow liquid

Property	Value	Data Source/Justification
Pour point	< -34 °C	(M)SDS
Boiling Point	Decomposes prior to boiling	(M)SDS
Specific gravity	942 kg/m^3 at 25 °C	(M)SDS
Vapour Pressure	2.93 × 10^{-20} kPa at 25 °C	Calculated (MPBVP)
Water Solubility	Not determined	Expected to be low based on the structure and characteristics of the notified polymer
Hydrolysis as a Function of pH	Not determined	The notified polymer contains no readily hydrolysable functionalities and hence is not expected to hydrolyse under normal environmental conditions (pH 4-9)
Partition Coefficient (n-octanol/water)	Not determined	Expected to partition to n-octanol based on the expected low water solubility of the notified polymer
Adsorption/Desorption	Not determined	Expected to partition to sediment/sludge based on the expected low water solubility of the notified polymer
Dissociation Constant	Not determined	Does not contain any dissociable functional groups.
Flash Point	216 °C (Open cup)	(M)SDS
Flammability	Not determined	Not expected to be highly flammable based on the flash point
Autoignition Temperature	Not determined	Expected to be high based on the flash point
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties

DISCUSSION OF PROPERTIES

Reactivity
A stability study report on UCON™ OSP-32 Lubricant was provided which showed the notified polymer was stable at ambient temperature over a course of 44 days in corn oil at concentrations ranging from 2.50 to 250 mg/mL (Dow 2013a).

The notified polymer is expected to be stable under normal conditions of use.

Physical hazard classification
Based on the submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will not be manufactured in Australia. It will be imported in neat form or in finished products (oils and greases) at concentrations ranging from 5% to 90%.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	10-50	10-50	10-50	10-50	10-50

PORT OF ENTRY
Sydney, Melbourne and Brisbane

IDENTITY OF RECIPIENTS
Rohm and Haas Australia Pty Ltd
Dow Chemical (Australia) Limited
Afton Chemical Asia Pacific LLC
Shell Company of Australia

TRANSPORTATION AND PACKAGING
The neat form of the notified polymer will be imported in 205 L drums. Finished lubricant products containing the notified chemical will be imported in various types of containers. Both neat form of the notified polymer and products containing it will be transported by rail or road within Australia.

USE
The notified polymer will be used as base fluids or additives for lubricant oils and greases which will be mainly used for industrial applications. Some minor consumer use (< 2% import volume) of the finished lubricant products (motor oils and greases) is also expected.

OPERATION DESCRIPTION

Reformulation
The neat form of the notified polymer will be reformulated locally using a typical liquid blending process.

During reformulation, the notified polymer will be transferred from the original containers into blending vessels using automated pumping/dosing equipment. The containers will be opened by workers and connected to the blending vessels with pipes/hoses using quick connect fittings. The blending vessels will be sealed and supplied with local fume extraction. The blending vessels will also be located in bunded areas to capture spills. Quality assurance (QA) staff will take samples from sampling ports for analysis. When blending processes are completed, the finished products will be fed by gravity into an automated filling machine where the products will be filled into various types of end-use containers.

End-use
Hydraulic and compressor fluid
The finished fluid containing the notified polymer at up to 90% concentration will be filled into the equipment at OEM and may require top up from time to time during the use of the equipment. The fluid will be enclosed within the equipment. During loading, the fluid will be pumped from the containing drums directly into the equipment reservoir. Workers will connect and disconnect pumping equipment during the processes.

Gear oils
The notified polymer will be supplied to industrial customers in the form of formulated oils containing up to 90% of the notified polymer in 205 L steel drums or 1-4 L plastic bottles. Workers will open the 205 L drums and connect pumping equipment and hoses which will be used to dispense the oils into the reservoir of industrial machinery. The oils in smaller containers will be manually poured into the reservoirs. Maintenance workers will also be involved in draining spent oils from the machinery during servicing.

The gear oils in the smaller containers will also be available for DIY consumers.

Greases
The finished greases will contain the notified polymer at concentration of 5-10%. When used in large industrial equipment, the grease will be pumped from a grease plant equipped with heavy gear grease pumps into reservoirs of the equipment. The reservoirs will feed automated lubrication injector systems in the equipment. Workers will connect and disconnect pumping devices during the operations.

Maintenance workers may also use pressurised or manual grease guns to apply the greases to lubricate various parts of industrial equipment. The finished greases will be supplied in aluminium cartridges which are designed to fit into the grease guns. During the operations, excess greases will be manually wiped off using rags.

Metalworking lubricants
Oil-based, metalworking fluids containing the notified polymer at concentrations up to 10% will be used in metal forming mill and lathe unit operations. These operations will be conducted within enclosed machinery. The metalworking fluids will be coated onto the metal surface and excess fluid will drip down into a sump. The fluids will be recirculated within the equipment after filtering. Residual fluids will be removed from the metal surface using high velocity air blast prior to manual removal of the metal parts from the machine. The machine will be supplied with local ventilation to remove potential mists and vapours. On initial set up and occasional top ups, the lubricant fluids will be manually poured into the machinery reservoirs.

Motor oils
Reformulated oils containing up to 90% of the notified polymer will be supplied to OEM industrial customers and to aftermarket service mechanics in 205 L steel drums and 1-4 L plastic bottles respectively.

In OEM sites, workers will open the 205 L drums and connect pumping equipment and hoses to dispense fixed volumes of oils into motor vehicles on the assembly lines.

The motor oils in smaller containers will be used by aftermarket service mechanics who will manually pour the oils into the vehicle reservoirs. Mechanics will also be involved in draining spent oils from vehicles during servicing.

The motor oils in the smaller containers will also be available for DIY consumers.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and warehousing	4	30
Blending plant operators	5	12
Blending QA staff	2	12
End-use plant operators	4-12	200
End-use maintenance workers	4-12	200
Vehicle manufacturing and mechanics	8	200

EXPOSURE DETAILS
Transport and warehousing
Transport and storage workers will only handle sealed containers and exposure is only expected to occur in the event of container breach.

Blending plant operators and QA
At the reformulation sites, workers may be exposed to the neat notified polymer or to the finished lubricants (containing up to 90% of notified polymer) during the blending and filling operations. Dermal and ocular exposure will likely be the main routes. The notifier stated that the blending facilities will be well ventilated, with control systems for accidental spills and wastewater treatment. Workers involved in the blending activities will receive training in the handling of chemical substances, and wear personal protective equipment (PPE) such as chemical gloves, eye protection, protective clothing and hard hats. QA staff will wear laboratory coats, safety glasses, and impervious gloves. Maintenance workers will wear coveralls, safety glasses, chemical gloves and hardhat, and only work on the equipment after flushing through with solvent.

End-use plant operators and maintenance workers
End use plant operators may be exposed to the notified polymer at a concentration of up to 90%. Worker exposure may occur during transfer of the finished lubricant products from the storage containers into the machinery reservoirs, and during cleaning and maintenance of equipment. There is potential for dermal and ocular exposure when the lubricants are added to and drained from the systems. The notifier stated that the processes will be mostly enclosed or supplied with engineering controls such as shielding and local ventilation to

reduce the exposure from splashes, mists and vapours. Plant operators and maintenance workers will wear PPE such as gloves, eye protection, protective clothing and hard hats in order to further reduce exposure.

Vehicle manufacturing and mechanics
There is potential for dermal and ocular exposure to the notified polymer at concentrations up to 90% by workers at automotive manufacturing facilities and automotive repair facilities, and by professionals who will be charging motors with lubricant oils and draining used oil from the engines. Exposure may be minimised by the use of gloves, goggles and protective clothing.

6.1.2. Public Exposure
Finished gear oils and motor oils containing the notified polymer will also be available for the DIY market. Therefore dermal and ocular exposure to the notified polymer at up to 90% concentration may occur during oil changes and top-ups. PPE is not expected to be worn by the public although the frequency of exposure is expected to be low.

6.2. Human Health Effects Assessment
The results from toxicological investigations conducted on the notified polymer are summarised in the following table. For full details of the studies, refer to Appendix B. The studies have been conducted on UCON™ OSP-32 Lubricant, one of a series of different grades of the notified polymer having the lowest molecular weight range.

Endpoint	*Result and Assessment Conclusion*
Rat, acute oral toxicity	LD50 > 2.000 mg/kg bw; low toxicity
Rat, acute dermal toxicity	LD50 > 2,000 mg/kg bw; low toxicity
Rabbit, skin irritation	slightly irritating
Rabbit, eye irritation	slightly irritating
Rat, repeat dose oral toxicity – 90 days.	NOAEL = 1,000 mg/kg bw/day
Mutagenicity – bacterial reverse mutation	non mutagenic
Genotoxicity – *in vitro* mammalian cell gene mutation test	non genotoxic
Genotoxicity – *in vitro* mammalian chromosomal aberration test	non clastogenic

Toxicokinetics, metabolism and distribution
No information on toxicokinetics for the notified polymer was provided. Based on the use patterns, the main exposure route is expected to be dermal. Given the low water solubility and molecular weight of > 500 Da the dermal absorption potential may be limited.

Acute toxicity
Based on studies conducted on UCON™ OSP-32 Lubricant, the notified polymer is expected to be of low acute toxicity via the oral and dermal routes.

No information was provided on the acute inhalation toxicity of the notified polymer. The notified polymer has a low vapour pressure; hence inhalation exposure is not expected unless aerosols or mists are formed. Furthermore, acute inhalation toxicity is not expected given limited treatment related effects were observed in the acute oral and dermal toxicity studies and repeated dose oral toxicity study.

Irritation and sensitisation
Based on studies conducted on UCON™ OSP-32 Lubricant, the notified polymer is considered to be slightly irritating to the skin and eye. The MSDS of UCON™ OSP-32 Lubricant also states that vapour from the heated material or mist may cause respiratory irritation.

Skin sensitisation potential of the notified polymer was not determined. The notified polymer does not contain any structural alerts indicative of skin sensitisation properties. Furthermore, available information on structurally similar analogues did not reveal evidence of sensitisation.

Repeated dose toxicity
A 90-day repeated dose oral toxicity study conducted on UCON™ OSP-32 Lubricant was provided. Female rats dosed at 1,000 mg/kg bw/day showed low urine volume with concomitant high specific gravity. The effect was not considered as adverse since there were no treatment-related histopathological changes observed in the kidneys of the affected animals. A systemic effect was noted in the kidneys of the males across all dose groups, showing a marginal increase in severity of renal tubular mineralisation. A few males also showed very slight focal or multifocal dilatation of the medullary tubules. However, these effects were not considered as adverse by

the study authors as they did not relate to any functional significance and there were no corresponding treatment-related kidney weight effects or alterations in serum clinical chemistry parameters which would indicate renal dysfunction.

A No Observed Adverse Effect Level (NOAEL) of 1,000 mg/kg bw/day was established based on the highest dose tested in the study.

Mutagenicity/Genotoxicity
A bacterial reverse mutation test, an *in vitro* mammalian cell gene mutation test and an *in vitro* mammalian chromosome aberration test were conducted on UCON™ OSP-32 Lubricant. Results showed no evidence of mutagenicity for the notified polymer.

Health hazard classification
Based on the available information, the notified polymer is not recommended for classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety
Based on the available information, the notified polymer is expected to be of low hazard presenting only as a slight skin and eye irritant. Vapour from heated notified polymer or mist may also cause respiratory irritation (MSDS of UCON™ OSP-32 Lubricant).

Reformulation workers and end-users handling the notified polymer at > 90% concentration will be most at risk of irritating effects. The expected use of PPE should minimise this risk. Furthermore, the use of automated enclosed processes during reformulation and packaging should minimise any potential for inhalation exposure to aerosols or mists.

Therefore, when used under the occupational settings described, the risk of the notified polymer to the health of workers is not expected to be unreasonable.

6.3.2. Public Health
The public may be exposed to the notified polymer at up to 90% concentration during oil changes and top-ups of automotive engines containing lubricants (gear and motor oils) incorporating the notified polymer. Due to the expected low systemic hazard of the notified polymer and the expected low frequency of exposure, the notified polymer is not considered to pose an unreasonable risk to public health.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE
The notified polymer will be imported into Australia as end use products or neat polymer for further reformulation. The application in Australia will be as base fluids or additives for lubricant oils and greases mainly used for industrial application. Significant release of the notified polymer to the environment is not expected during transport and storage except in the unlikely event of accidental spills or leaks.

Any notified polymer spilled during reformulation is expected to be contained with bunds and either reclaimed or sent to on-site waste treatment facilities. At the on-site waste treatment facilities, residues of the notified polymer will be separated from the aqueous waste stream by the American Petroleum Industry (API) process. As a result of this treatment, greater than 90% of the notified polymer is estimated to be removed. The aqueous waste undergoes further treatment involving pond aeration and biological treatment before being released to the sewage system. The remaining non-aqueous waste is expected to be disposed of according to local regulations, which is most likely to landfill. Therefore, the accidental release from reformulation of the notified polymer and finished oils is unlikely to be significant.

RELEASE OF CHEMICAL FROM USE

The finished products containing the notified polymer will be used as a component of lubricants and greases. The oils will also be used as hydraulic and compressor fluids and metal working fluids. Release during its use may come from spills when pouring lubricants into the machinery reservoirs or leaks from the machinery, which is expected to be negligible.

RELEASE OF CHEMICAL FROM DISPOSAL

After reformulation, empty import drums containing residues of the notified polymer (0.1% of the total import volume) are expected to be steam cleaned, with the residual waste sent to on-site wastewater treatment facilities. Assuming 0.1% of the notified polymer remains in the empty drums after use, 50 kg/yr (50 tonnes/yr × 0.1%) of the notified polymer will be sent to the on-site waste treatment. It is estimated that greater than 90% of the notified polymer may be removed during waste treatment processes. Therefore, the amount of the notified polymer released to sewer from the cleaning of empty drums is estimated to be 5 kg/yr (= 5 kg/yr × 10%). The wastewater will be further treated at the sewage treatment plants. Therefore, the release of the notified polymer to surface waters is expected to be limited from the cleaning of empty drums.

The majority of the formulated lubricants containing the notified polymer will be used as hydraulic and air compressor fluids. These will be enclosed systems. The systems will require initial loading and occasional top-up. At the end of life, the fluids will be drained from the machinery for disposal. The main method of disposal will be by recycling or thermal decomposition (40 tonnes/yr). Some of the residual fluid within the machinery (7 tonnes/yr) will have the same fate as the machinery which may be recycled as scrap metal (3.5 tonnes/y) or disposed of to landfill (3.5 tonnes/yr).

A small proportion of the notified polymer will be used in greases and gear oils, which will be mainly used in industry by professionals. When used in greases and gear oils, the notified polymer is likely to have a similar fate as above. A very small amount of gear oil is available for DIY, which may be disposed of to landfill or public water at the end of life.

Metalworking fluids will also have an initial loading into the machinery and the fluid will be recycled within the machinery until it requires top-up or changing. Spent fluid will be drained from the machinery sump and collected for waste disposal by a professional contractor. The fluid is likely to be recycled (150 kg/yr) or thermally decomposed. Collected spills and leaks and residues in empty containers will be collected for either thermal decomposition or landfill disposal (50 kg/yr).

Use in motor oils will be a minor use. The notified polymer may be released to the environment during disposal of waste or used oils. Oil products containing the notified polymer will be poured into engines by automotive manufacturers, service centres or by do-it-yourself (DIY) consumers. A survey by the Australian Institute of Petroleum (AIP, 1995) indicates that of the annual sales of engine oils in Australia, 60% of oils are potentially recoverable (i.e. not burnt in the engines during use). This report also indicates that around 86% of oil changes take place in specialised automotive service centres, where old oil drained from crankcases is disposed of responsibly (e.g. oil recycling or incineration). Assuming this is the case, negligible release of the notified polymer should result from these professional activities. The remaining 14% of oil is removed by DIY consumers. In these cases, some of the used oil would be either incinerated, left at transfer stations where it is again likely to be recycled, or deposited into landfill. It was estimated that DIY activities account for 7 - 10% of the unaccounted used oil (Meinhardt, 2002).

According to a survey tracing the fate of used lubricating oil in Australia (Snow 1997), only approximately 20% of used oil removed by DIY consumers is collected for recycling, approximately 25% is buried or disposed of in landfill, 5% is disposed of into stormwater drains and the remaining 50% is used in treating fence posts, killing grass and weeds or disposed of in other ways. In a worst case scenario involving the 14% of used oil removed by DIY consumers, up to 0.7% (= 14% × 5%) of the total import volume of the notified polymer may enter the aquatic environment via disposal to stormwater drains. Therefore, the amount of the notified polymer released to the aquatic environment from disposal of used oil due to DIY consumers is expected to be 3.5 kg/yr (= 0.5 tonnes/year used in motor oils × 0.7%). In addition to this, considering the unknown fate of some of the oil used by DIY consumers, a small proportion may also be disposed of to the sewer. Since the use of the lubricating oils will occur throughout Australia, all releases resulting from use or disposal of used oil will be very diffuse, and release of the notified polymer in neat concentrations is unlikely except as a result of transport accidents.

7.1.2. Environmental Fate

The notified polymer exceeded a biodegradation degree of 60% within the 28 day test period. It is expected to be biodegradable in the environment. For the details of the environmental fate studies please refer to Appendix C. Based on the structure and characteristics of the notified polymer, it is expected to have low water solubility. Given its low molecular weight (< 1,000), the presence of a hydrophobic segment, and the lack of charged functional groups, it may have potential for bioaccumulation. However, due to its expected low water solubility and biodegradability in the environment, the notified polymer is not expected to be bioavailable to aquatic organisms.

A very small amount (< 60 kg/yr) of the notified polymer is expected to be released to public water. The majority of the notified polymer is expected to be consumed during use or be recycled or thermally decomposed during metal reclamation/disposed of to landfill. In either way, the notified polymer is expected to decompose into water and oxides of carbon.

7.1.3. Predicted Environmental Concentration (PEC)

The Predicted Environmental Concentration (PEC) is not calculated since no significant release to the aquatic environment is expected based on the proposed use pattern.

7.2. Environmental Effects Assessment

The results from ecotoxicological investigations conducted on the notified polymer are summarised in the table below. Details of these studies can be found in Appendix C.

Endpoint	*Result*	*Assessment Conclusion*
Fish Toxicity	96 h LL50 > 105 mg/L (WAF)	Not harmful to fish
Daphnia Toxicity	48 h EL50 > 1000 mg/L (WAF)	Not harmful to aquatic invertebrates
Algal Toxicity	72 h EL50 > 100 mg/L (WAF)	Not harmful to algae

The toxicity data to fish, daphnia and alga in the table above suggest that the notified polymer is not harmful to aquatic organisms up to the limit of water solubility. No chronic toxicity data is available. The notified polymer is considered to be readily biodegradable. Therefore, under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (United Nations, 2009), the notified polymer is not expected to be harmful to fish, invertebrates and algae on an acute or long term basis and is not formally classified under the GHS.

7.2.1. Predicted No-Effect Concentration

It is not necessary to calculate the Predicted No-Effect Concentration (PNEC) since no significant release of the notified polymer is expected from the proposed use pattern.

7.3. Environmental Risk Assessment

The risk quotient (RQ = PEC/PNEC) has not been calculated. The notified polymer is not harmful to the aquatic environment. The notified polymer is not expected to persist in the environment due to its biodegradability. Therefore, based on the assessed use pattern and low potential for aquatic exposure, the notified polymer is not expected to pose an unreasonable risk to the environment.

APPENDIX B: TOXICOLOGICAL INVESTIGATIONS

B.1. Acute toxicity – oral

TEST SUBSTANCE	Notified polymer (UCON™ OSP-32 Lubricant)
METHOD	OECD TG 425 Acute Oral Toxicity: Up-and-Down Procedure
Species/Strain	Rat/Fischer 344
Vehicle	None
Remarks - Method	No significant deviations of the protocol were noted. Test substance was directly administered to the animals by gavage at a dose level of 2,000 mg/kg bw. Test animals were observed for 14 days before termination and necropsy.

RESULTS

Group	*Number and Sex of Animals*	*Dose (mg/kg bw)*	*Mortality*
1	5 F	2,000	0/5

LD50	> 2,000 mg/kg bw
Signs of Toxicity	No signs of gross toxicity, adverse clinical effects or abnormal behaviour were noted.
Effects in Organs	No gross abnormalities were noted at necropsy.
Remarks - Results	All test animals gained body weight, and appeared active and healthy during the study.
CONCLUSION	The notified polymer is of low toxicity via the oral route.
TEST FACILITY	Eurofins PSL (2010a)

B.2. Acute toxicity – dermal

TEST SUBSTANCE	Notified polymer (UCON™ OSP-32 Lubricant)
METHOD	OECD TG 402 Acute Dermal Toxicity. EC Council Regulation No 440/2008 B.3 Acute Toxicity (Dermal).
Species/Strain	Rat/Fischer 344
Vehicle	None
Type of dressing	Semi-occlusive.
Remarks - Method	No significant deviations of the protocol were noted. Test substance was administered using gauze pads to the skin of ten animals at a dose level of 2,000 mg/kg bw. After 24 hours exposure, the test substance was removed and cleaned from the skin. Test animals were observed for 14 days before termination and necropsy.

RESULTS

Group	*Number and Sex of Animals*	*Dose (mg/kg bw)*	*Mortality*
1	5 F	2,000	0/5
2	5 M	2,000	0/5

LD50	> 2,000 mg/kg bw
Signs of Toxicity - Local	Dermal irritation signs (erythema and oedema) were noted at the dose site of 3 female and 2 male rats between Days 1 and 3. No other signs of gross toxicity, adverse clinical effects and abnormal behaviour were noted.
Signs of Toxicity - Systemic	Two males lost body weight by Day 7 but regained the weight by Day 11.
Effects in Organs	No gross abnormalities were noted for the test animals at the necropsy.
Remarks - Results	All test animals appeared active and healthy during the study, and gained body weight by the end of the 14-day observation period.

CONCLUSION	The notified polymer is of low toxicity via the dermal route.
TEST FACILITY	Eurofins PSL (2010b)

B.3. Irritation – skin

TEST SUBSTANCE	Notified Polymer (UCON™ OSP-32 Lubricant)
METHOD	OECD TG 404 Acute Dermal Irritation/Corrosion. EC Council Regulation No 440/2008 B.4 Acute Toxicity (Skin Irritation).
Species/Strain	Rabbit/New Zealand White
Number of Animals	3 (males)
Vehicle	None
Observation Period	7 days
Type of Dressing	Semi-occlusive.
Remarks - Method	No significant deviations of the protocol were noted. 500 µL of the test substance was administered to the skin of the test animals for 4 hours.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Erythema/Eschar	2	2	1.7	2	< 7 days	0
Oedema	1.3	1.3	1.3	2	< 7 days	0

*Calculated on the basis of the scores at 24, 48, and 72 hours for EACH animal.

Remarks - Results	Within 24 hours after patch removal, well-defined erythema and slight oedema were noted for all three treated sites. The incidence and severity of irritation decreased with time. All test animals were recovered by Day 7 of the study.
CONCLUSION	The notified polymer is slightly irritating to the skin.
TEST FACILITY	Eurofins PSL (2010c)

B.4. Irritation – eye

TEST SUBSTANCE	Notified polymer (UCON™ OSP-32 Lubricant)
METHOD	OECD TG 405 Acute Eye Irritation/Corrosion. EC Council Regulation No 440/2008 B.5 Acute Toxicity (Eye Irritation).
Species/Strain	Rabbit/New Zealand White
Number of Animals	3 (female)
Observation Period	72 hours
Remarks - Method	No significant deviations of the protocol were noted. 100 µL of the test substance was instilled into the conjunctival sac of the right eye of the test animal. The left eye of the test animal remained untreated and served as a control.

RESULTS

Lesion	*Mean Score* Animal No.*			*Maximum Value*	*Maximum Duration of Any Effect*	*Maximum Value at End of Observation Period*
	1	2	3			
Conjunctiva: redness	0.7	0.7	1	2	< 72 hours	0
Conjunctiva: chemosis	0	0.3	0.7	1	< 72 hours	0
Conjunctiva: discharge	0.7	0.7	0	1	< 72 hours	0
Corneal opacity	0	0	0	0	N/A	0

Iridial inflammation	0	0	0.3	1	< 48 hours	0

*Calculated on the basis of the scores at 24, 48, and 72 hours for EACH animal.

Remarks - Results: One hour after the exposure, all three treated eyes exhibited conjunctival and iridial irritation. The incidence and severity of the irritation decreased with time. By 72 hours, all signs of irritation were resolved in all test animals.

CONCLUSION: The notified polymer is slightly irritating to the eye.

TEST FACILITY: Eurofins PSL (2010d)

B.5. Repeat dose toxicity

TEST SUBSTANCE: Notified polymer (UCON™ OSP-32 Lubricant)

METHOD: OECD TG 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents.
EC Directive 2001/59/EC B.26 Subchronic Oral Toxicity Test: Repeated Dose 90-Day Oral Toxicity Study in Rodents.

Species/Strain: Rats/F344/DuCrl
Route of Administration: Oral – gavage
Exposure Information: Total exposure days: 90 days
Dose regimen: 7 days per week
Post-exposure observation period: None
Vehicle: Corn oil
Remarks - Method: No significant deviations of protocols were noted.

In a range finding study, female rats were dosed at 500, 750 and 1,000 mg/kg bw/day for 21 days (Dow, 2012). As no effects on clinical signs, body weight, organ weights or gross pathological observations were noted in the range finding study, the limit dose of 1,000 mg/kg bw/day was considered for this study.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw/day*	*Mortality*
Control	10 F/10 M	0	0/20
Low dose	10 F/10 M	100	0/20
Mid dose	10 F/10 M	300	0/20
High dose	10 F/10 M	1000	0/20

Mortality and Time to Death
No unscheduled animal deaths were recorded.

Clinical Observations
There were no treatment-related clinical observations noted at any dose level.

Laboratory Findings – Clinical Chemistry, Haematology, Urinalysis
Females dosed at 1,000 mg/kg bw/day showed treatment-related lower mean urine volume with concomitant higher specific gravity compared to the controls. The effect was not considered as adverse since there were no treatment-related histopathological changes observed in the kidneys of the affected animals.

Effects in Organs
A treatment-related systemic effect was noted in the kidneys of males across all dose groups, consisting of marginal increase in severity (slight) of background renal tubular mineralisation of the inner strip of the medulla. A few males also showed very slight, focal or multifocal dilatation of the medullary tubules. These effects were not considered as adverse for the following reasons:

a. The severity of the mineralisation was slight and would not relate to functional significance.

b. There were no corresponding alterations in serum clinical parameters that would indicate any renal dysfunction.
c. The mineralisation was absent in other tissues/organs.

There were no treatment-related effects in kidneys of female rats at any dose level.

Remarks – Results
A statistically significant increase of relative heart weight of the rats dosed at 1,000 mg/kg bw/day was noted but not considered as treatment-related, because the changes were within the historic control range and there was no correlating histopathological evidence in the hearts affected.

The lung of males treated at 300 and 1,000 mg/kg bw/day showed treatment-related slight to moderate bronchiolo-alveolar inflammation. This was interpreted to be caused by the aspiration of droplets of the test substance during the oral gavage and not considered as a result of systemic toxicity.

CONCLUSION
The No Observed Adverse Effect Level (NOAEL) was established as 1,000 mg/kg bw/day in this study, based on highest dose tested.

A No Observed Effect Level (NOEL) was established as 300 mg/kg bw/day for females only in this study, based on the effects of reduced urinary volume concomitant with increased specific gravity observed in the dose level of 1,000 mg/kg bw/day.

A NOEL could not be established for male rats due to marginal increase in severity of background renal medullary tubule mineralisation in all dose groups.

TEST FACILITY Dow (2013b)

B.6. Genotoxicity – bacteria

TEST SUBSTANCE Notified polymer (UCON™ OSP-32 Lubricant)

METHOD
OECD TG 471 Bacterial Reverse Mutation Test.
EC Directive 2000/32/EC B.13/14 Mutagenicity – Reverse Mutation Test using Bacteria.
Pre incubation procedure.

Species/Strain
S. typhimurium: TA1535, TA1537, TA98, TA100
E. coli: WP2*uvr*A (pKM101)

Metabolic Activation System
Aroclor 1254 induced rat liver homogenate (S-9, 10%)

Concentration Range in Main Test
a) With metabolic activation: 1.5 – 5,000 µg/plate
b) Without metabolic activation: 100 – 5,000 µg/plate

Vehicle
Ethanol

Remarks - Method
No significant deviation of the protocol was noted.

Positive control used
With metabolic activation:
a) 2-Aminoanthracene (4 µg/plate) – for all samples
Without metabolic activation:
b) Sodium azide (1 µg/plate) – for TA100 and TA1535
c) 2-Nitrofuorene (2 µg/plate) – for TA98
d) 9-Aminoacridine (50 µg/plate) – for TA1537
e) 4-Nitroquinoline-1-oxide (4 µg/plate) – for WP2*urr*A (pKM101)

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/plate) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	> 5,000	-	> 5,000	Negative

Test 2	-	> 5,000	> 5,000	Negative
Present				
Test 1	> 5,000	-	> 5,000	Negative
Test 2	-	> 5,000	> 5,000	Negative

Remarks - Results: No toxicologically significant increases in the frequency of revertant colonies were recorded for any of the bacterial strains, at any dose of the test substance, either with or without metabolic activation.

More than 3-fold increase in revertant colonies was observed in the positive controls, indicating the sensitivity of the assay.

CONCLUSION: The notified polymer was not mutagenic to bacteria under the conditions of the test.

TEST FACILITY: Advinus (2013a)

B.7. Genotoxicity – *in vitro*

TEST SUBSTANCE: Notified polymer (UCON™ OSP-32 Lubricant)

METHOD: OECD TG 476 *In vitro* Mammalian Cell Gene Mutation Test.
EC Directive 2000/32/EC B.17 Mutagenicity - *In vitro* Mammalian Cell Gene Mutation Test.

Species/Strain: Chinese hamster
Cell Type/Cell Line: Ovary cells/CHO-K1
Metabolic Activation System: Aroclor 1254 induced rat liver homogenate (S-9, 10%)
Vehicle: Ethanol
Remarks - Method: No significant deviation of the protocol was noted.

Positive control used
With metabolic activation: 3-methylcholanthrene (8 µg/mL)
Without metabolic activation: ethyl methanesulfonate (600 µg/mL)

Metabolic Activation	*Test Substance Concentration (µg/mL)*	*Exposure Period*	*Expression Time*	*Selection Time*
Absent				
Test 1	6.25, 12.5, 25, 50, 100	4 hours	9 days	10 days
Test 2	11, 19, 33, 57, 100	4 hours	9 days	10 days
Present				
Test 1	6.25, 12.5, 25, 50, 100	4 hours	9 days	10 days
Test 2	11, 19, 33, 57, 100	4 hours	9 days	10 days

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/mL) Resulting in:*			
	Cytotoxicity in Preliminary Test	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	> 5,000	> 100	≥ 100	Negative
Test 2	-	> 100	≥ 100	Negative
Present				
Test 1	> 5,000	> 100	≥ 100	Negative
Test 2	-	> 100	≥ 100	Negative

Remarks - Results: The test substance precipitated in the medium at concentrations ≥ 78 µg/mL. The highest test concentration was therefore determined to be 100 µg/mL.

There was no evidence of induction of gene mutations in any of the test

substance treated cultures either in the presence or absence of metabolic activation.

Positive controls produced a statistically significant increase in mutant frequencies, indicative of the effectiveness of the test system.

CONCLUSION The notified polymer was not mutagenic to CHO cells treated *in vitro* under the conditions of the test.

TEST FACILITY Advinus (2013b)

B.8. Genotoxicity – *in vitro*

TEST SUBSTANCE Notified polymer (UCON™ OSP-32 Lubricant)

METHOD OECD TG 473 *In vitro* Mammalian Chromosome Aberration Test.
EC Directive 2000/32/EC B.10 Mutagenicity - *In vitro* Mammalian Chromosome Aberration Test.

Species/Strain	Rat/Crl:CD(SD)
Cell Type/Cell Line	Lymphocytes
Metabolic Activation System	Aroclor 1254 induced rat liver homogenate (S9, 10%)
Vehicle	Ethanol
Remarks - Method	No significant deviation of the protocol was noted.

Positive controls used
With metabolic activation: cyclophosphamide (2 – 4 µg/mL)
Without metabolic activation: mitomycin C (0.5 – 1.0 µg/mL)

Metabolic Activation	*Test Substance Concentration (µg/mL)*	*Exposure Period*	*Harvest Time*
Absent			
Test 1	1.56, 3.13, 6.25, 12.5, 25, 50, 100	4 hours	24 hours
Test 2	0.78, 1.56, 3.13*, 6.25*, 12.5*, 25, 50, 100	24 hours	24 hours
Test 3	10, 20*, 40, 60*, 70, 80, 90, 100*	4 hours	24 hours
Present			
Test 1	1.56, 3.13, 6.25, 12.5, 25, 50, 100	4 hours	24 hours
Test 2	10, 20*, 40, 50*, 60, 70*, 80, 100	4 hours	24 hours

*Cultures selected for metaphase analysis.

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/mL) Resulting in:* *Cytotoxicity in Preliminary Test*	*Cytotoxicity in Main Test*	*Precipitation*	*Genotoxic Effect*
Absent				
Test 1	≥ 100	-	≥ 50	-
Test 2	-	≥ 12.5	≥ 50	Negative
Test 3	-	≥ 60	≥ 60	Negative
Present				
Test 1	≥ 50	-	≥ 50	-
Test 2	-	≥ 50	≥ 50	Negative

Remarks - Results The positive and vehicle controls gave satisfactory responses, confirming the validity of the test system.

The test substance did not induce any statistically significant increases in the frequency of cells with aberrations.

CONCLUSION The notified polymer was not clastogenic to rat lymphocytes treated *in vitro* under the conditions of the test.

TEST FACILITY Dow (2013c)

APPENDIX C: ENVIRONMENTAL FATE AND ECOTOXICOLOGICAL INVESTIGATIONS

C.1. Environmental Fate

C.1.1. Ready biodegradability

TEST SUBSTANCE	Notified polymer
METHOD	OECD TG 301 F Ready Biodegradability: Manometric Respirometry Test. US EPA OPPTS 835.3110 (1998)
Inoculum	Activated sludge
Exposure Period	28 days
Auxiliary Solvent	Not applied
Analytical Monitoring	Measurement of O_2 and CO_2 occurring were performed using the Columbus Micro-Oxygmax automated repirometry system. DOC concentration was determined using a Shimadzu model TOC-V analyzer.
Remarks - Method	The test was conducted according to the above mentioned OECD test guidelines. No significant deviations from the test guidelines were reported.

RESULTS

Notified polymer (biological oxygen demand)		*Aniline*	
Day	*% Degradation*	*Day*	*% Degradation*
7	10	4	10
17	40	7	60
28	75 (± 15)	28	119 (± 17.6)

Remarks - Results

All validity criteria for the test were satisfied. The reference control reached the pass level of 60% within 6.7 days. The toxicity control showed no evidence for inhibition of the microbial inoculum. The degree of degradation of the notified polymer at the end of the 10-day window was about 40%. The degree of degradation of the notified polymer was 75% based on biological oxygen demand (BOD) and 45% (± 7.5) based on CO_2, evolution within the 28 days test period.

The biodegradation degree of the notified polymer did meet the 10-day window criterion for readily biodegradability. The notified polymer is composed of complex mixture of polymeric components in its most purified commercial form. Since each component is expected to biodegrade at a unique rate, the course of biodegradation recorded in this test reflects a composite of individual biodegradation rates. The 10-day window criterion is therefore not relevant for classifying the rate of biodegradation, and thus the ready biodegradability of notified polymer. Therefore, the notified polymer is considered readily biodegradable according to the OECD (301 F) guideline.

CONCLUSION The notified polymer is considered readily biodegradable.

TEST FACILITY Dow (2010)

C.2. Ecotoxicological Investigations

C.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified polymer
METHOD	OECD TG 203 Fish, Acute Toxicity Test - Static. US EPA OPPTS 850.1075 Fish Acute Toxicity Test, Freshwater and Marine. 1996 - Static

Species	Rainbow trout (*Oncorhynchus mykiss*)
Exposure Period	96 hours
Auxiliary Solvent	Not applied
Water Hardness	22-24 mg $CaCO_3$/L
Analytical Monitoring	At initial and termination of the test the control corrected amount of non-purgeable organic carbon (NPOC) was analysed.
Remarks – Method	Following a range finding test, a definitive test was conducted at nominal concentration of 105 mg/L. Due to the limited water solubility of the notified polymer, water accommodated fraction (WAF) was used in the test. The test solution was prepared by direct addition of the notified polymer into laboratory dilution water, follow by agitation at 340 rpm for 24 hours. The test solutions were clear and colourless with oily material pooled on the surface.

RESULTS

Concentration (mg/L)		*Number of Fish*	*Mortality*				
Nominal	*Actual*		*1 h*	*24 h*	*48 h*	*72 h*	*96 h*
Control	Control	30	0	0	0	0	0
105	54	30	0	0	0	0	0

LL50	> 105 mg/L at 96 hours (WAF)
NOEL	≥ 105 mg/L at 96 hours (WAF)
Remarks – Results	All validity criteria for the test were satisfied. NPOC analysis indicates a decrease of the test concentration by 49% (from 0.74 to 0.38 mg/L) at the end of the test. Since a WAF method was used to prepare the treatment solutions, the endpoints were based on the nominal loading rates used to prepare the WAF solutions. No mortality of sub-lethal effects was observed throughout the test.

CONCLUSION The notified polymer is not harmful to fish

TEST FACILITY Dow (2013d)

C.2.2. Acute toxicity to aquatic invertebrates

TEST SUBSTANCE Notified polymer

METHOD OECD TG 202 *Daphnia* sp. Acute Immobilisation Test – Static Test

Species	*Daphnia magna*
Exposure Period	48 hours
Auxiliary Solvent	Not reported
Water Hardness	180-190 mg $CaCO_3$/L
Analytical Monitoring	Dissolved Organic Carbon (DOC) concentration was analysed by a Shimadzu model TOC-V analyzer
Remarks - Method	The test was conducted according to the guidelines above and good laboratory practice (GLP) principles. No significant deviations from the test guidelines were reported. Due to the limited water solubility of the test substance, a water accommodated fraction (WAF) was used in the test. The test solution was prepared by direct addition of the pre-determined amount of the test substance into the dilution water and mixed for approximately 48 hours.

RESULTS

Nominal Concentration (WAF;mg/L)	*Number of D. magna*	*Cumulative % Immobilised*	
		24 h	*48 h*
Control	30	0	0
1,000	30	0	0

LL50	> 1,000 mg/L at 48 hours (WAF)
NOEL	≥ 1,000 mg/L at 48 hours (WAF)
Remarks - Results	All validity criteria for the test were satisfied. The test solutions were clear and colourless with no visible undissolved test substance. The notified polymer is considered, based on the test result, not harmful to algae up to its limit of water solubility.
CONCLUSION	The notified polymer is not harmful to algae up to its limit of water solubility.
TEST FACILITY	Springborn (2010)

C.2.3. Algal growth inhibition test

TEST SUBSTANCE	Notified polymer
METHOD	OECD TG 201 Alga, Growth Inhibition Test
Species	*Pseudokirchneriella subcapitata*
Exposure Period	96 hours
Concentration Range	Nominal: 6.3, 13.0, 25.0, 50.0, and 100 mg/L
Auxiliary Solvent	Not reported
Water Hardness	Not reported
Analytical Monitoring	Dissolved Organic Carbon (DOC) concentration was analysed by a Shimadzu model TOC-V analyzer.
Remarks - Method	The test was conducted according to the guidelines above and good laboratory practice (GLP) principles. No significant deviations from the test guidelines were reported. The test was conducted for 96 hours, but 72-hours endpoints were presented as standard for algae test. WAFs of nominal loading rates were prepared by stirring the test substance in water by using a magnetic stirrer for 24 hours followed by a 24-hour settlement period. The supernatant solution was used in the experiment.

RESULTS

Biomass (72 h)		*Growth (72 h)*	
E_yL50 (mg/L)	*NOE_yL (mg/L)*	*E_rL50 (mg/L)*	*NOE_rL (mg/L)*
>100	25	>100	25

Remarks - Results	All validity criteria for the test were satisfied. All the exposure treatments (loading rates) were observed to be clear and colourless except the highest treatment, which is 100 mg/L, was cloudy. The E_rL50 and E_yL50 were calculated using two sigmoid-shaped nonlinear models (SAS version 9.2).
CONCLUSION	The notified polymer is not harmful to algae up to the limit of its water solubility.
TEST FACILITY	Dow (2013e)

BIBLIOGRAPHY

Advinus (2013a) UCON™ OSP-32 Lubricant: *Salmonella-Escherichia coli* / Mammalian-Microsome Reverse Mutation Assay Pre-Incubation Method with a Confirmatory Assay (Study No.: G8549, February, 2013). Bangalore, India, Department of Safety Assessment, Advinus Therapeutics Limited (Unpublished report submitted by the notifier).

Advinus (2013b) UCON™ OSP-32 Lubricant: *In Vitro* Mammalian Cell Gene Mutation Test in CHO Cells (Study No.: G8550, March, 2013). Bangalore, India, Department of Safety Assessment, Advinus Therapeutics Limited (Unpublished report submitted by the notifier).

Dow (2010) UCON™ OSP Lubricant Series: Evaluation of Ready Biodegradability According to the OECD 301 F-Manometric Respirometry Test (Study No. 091137, August 2010). USA, The Dow Chemical Company (Unpublished report submitted by the notifier).

Dow (2012) UCON™ OSP-32 Lubricant: Oral Gavage Range Finder Study in Female F344/DuCrl Rats (Study ID 120264, November, 2012). Michigan, USA, Toxicology & Environmental Research and Consulting, The Dow Chemical Company (Unpublished report submitted by the notifier).

Dow (2013a) UCON™ OSP Lubricant 32: Method Validation and Stability in Corn Oil (Study ID 121149, January, 2013). Michigan, USA, Toxicology & Environmental Research and Consulting, The Dow Chemical Company (Unpublished report submitted by the notifier).

Dow (2013b) UCON™ OSP-32 Lubricant: 90-Day Oral Gavage Study in Male and Female F344/DuCrl Rats (Study ID 121148, May, 2013). Michigan, USA, Toxicology & Environmental Research and Consulting, The Dow Chemical Company (Unpublished report submitted by the notifier).

Dow (2013c) Evaluation of UCON™ OSP-32 Lubricant in an *In Vitro* Chromosomal Aberration Assay Utilizing Rat Lymphocytes (Study ID 121147, February, 2013). Michigan, USA, Toxicology & Environmental Research and Consulting, The Dow Chemical Company (Unpublished report submitted by the notifier).

Dow (2013d) UCON™ OSP Lubricant Series: An Acute Toxicity Study with the Rainbow Trout, *Oncorhynchus mykiss* (Study No. 091197, March 2013). USA, The Dow Chemical Company (Unpublished report submitted by the notifier).

Dow (2013e) UCON™ OSP Lubricant Series: Growth Inhibition Test with the Green Alga, *Pseudokirchneriella subcapitata* (Study No. 121198, April 2013). USA, The Dow Chemical Company (Unpublished report submitted by the notifier).

Eurofins PSL (2010a) UCON™ OSP-32 Lubricant: Acute Oral Toxicity Up And Down Procedure in Rats (EPSL Study Number 29663, Dow Study Number 100065, August, 2010). New Jersey, USA, Eurofins PSL (Unpublished report submitted by the notifier).

Eurofins PSL (2010b) UCON™ OSP-32 Lubricant: Acute Dermal Toxicity Study in Rats (EPSL Study Number 29664, Dow Study Number 100066, August, 2010). New Jersey, USA, Eurofins PSL (Unpublished report submitted by the notifier).

Eurofins PSL (2010c) UCON™ OSP-32 Lubricant: Primary Skin Irritation Study in Rabbits (EPSL Study Number 29666, Dow Study Number 100067, August, 2010). New Jersey, USA, Eurofins PSL (Unpublished report submitted by the notifier).

Eurofins PSL (2010d) UCON™ OSP-32 Lubricant: Primary Eye Irritation Study in Rabbits (EPSL Study Number 29665, Dow Study Number 100068, August, 2010). New Jersey, USA, Eurofins PSL (Unpublished report submitted by the notifier).

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

Springborn (2010) UCON™ OSP Lubricant Series: Acute Toxicity to Water Fleas (*Daphnia magna*) Under Static Conditions, following OPPTS Draft Guideline 850.1010 and OECD Guideline 202 (Study No. 12550.6545, March 2010). USA, Springborn Smithers Laboratories (Unpublished report submitted by the notifier).

United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3rd revised edition. United Nations Economic Commission for Europe (UN/ECE), <http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html>.