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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Chemical 1 in Petro Products

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Akzo Nobel Chemicals Pty Ltd
Suite 10, 89 High St
Kew, Victoria 3101

NOTIFICATION CATEGORY
Limited-small volume: Chemical other than polymer, (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: Chemical identity, Impurities and additives and adjuvants, Spectral data, Import volumes, concentration of the notified chemical in products.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows: Melting point, density, vapour pressure, water solubility, dissociation constant, particle size, flash point, flammability, auto ignition temperature, explosive properties, reactivity.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None.

NOTIFICATION IN OTHER COUNTRIES
None.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
The following products contain less than 1% notified chemical.
Petro 22 liquid
Petro 22 powder
Petro BAF liquid
Petro BAF powder
Petro 11 liquid
Petro 11 solid
Petro BA liquid
Petro BA powder
Morwet 3008 liquid
Morwet 3008 powder
Petro ULF liquid

OTHER NAME(S)
Sodium alkylnaphthalenesulfonate

METHODS OF DETECTION AND DETERMINATION

METHOD Infrared spectra of products were provided.

3. COMPOSITION

DEGREE OF PURITY
Not applicable. The notified chemical is a complex mixture.

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
No hazardous impurities are expected to be present above the levels that would result in classification of the notified chemical as a hazardous substance.

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
Imported by sea, as a component of liquid or powdered products, in 200 kg drums or bulk bags (500 kg).

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

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

USE
Surface-active hydrotropes used at <0.1% notified chemical in a number of applications. Main applications are: hard surface cleaning (e.g. floors); metal cleaning (high alkaline and acid cleaners); rinse aid (e.g. dishwashing machines); carpet cleaning and as a brewery cleaner.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY
Sydney or Melbourne ports.

TRANSPORTATION AND PACKAGING
Imported drums or bags are transported from the wharf by road to sites of reformulation or to warehouses for later distribution. Reformulated products containing <0.1% notified chemical are transported by road in <1 L – 205 L containers.

5.2. Operation description

At the formulation sites, products containing the notified chemical (<1%) are added to 150-200,000 L stainless steel mixing vessels, either directly from a 205 L drum, via a manifold and metering system from a drum or storage vessel, or from smaller drums or buckets that have been pre weighed. Other ingredients are added and the formulation is stirred for 1-4 hours.

The product containing <0.1% notified chemical is packed off by gravity feed, or by pneumatic filling, into containers ranging in size from <1 L (generally plastic containers) to 205 L (drums). Product sampling occurs via pipette. The products may be sold to retail outlets or to cleaning corporations, or distributed to repackagers. Vessels and filling lines are cleaned between batches by flushing the system with water.

The cleaning products as supplied are usually diluted 1:10 prior to application, to give final concentrations of The final cleaning products (containing <0.01% notified chemical) are generally applied by one of the following methods:

- Application to a cloth or sponge, and wiping surfaces
- Spraying surfaces, followed by wiping
- Applying product with a mop or brush
- Applying product as a liquid stream, for example using a squeeze bottle or high pressure
- Soaking objects in product, followed by rinsing or wiping
- Application by machine, for example in hot and cold water pressure cleaners, including steam

or foam cleaning.

The notified chemical may also be used as a component of brewery cleaner, used to wash stainless steel vats or tanks. Formulation will be similar to that described above except that the resultant solution contains 25 – 48% caustic soda and filled to 1000 L isotainers or road tankers. After arrival at the brewery, conductivity controlled dosing to vats or tanks occurs, the vats or tanks are washed, and the waste water is disposed of to trade waste sewer after pH adjustment. Isotainers or tankers are rinsed at the formulator's site.

5.3. Occupational exposure

Number and Category of Workers

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
Transport and storage	50	4 hours/day	52 days/year
Warehouse	10	2 hours/day	100 days/year
Formulation process operator	100	2.5 hours/day	52 days/year
Quality control	5	1 hour/day	52 days/year
Packaging	20	3 hours/day	52 days/year
End use	5000	0.5 hours/day	365 days/year

Exposure Details

Transport, storage and warehouse workers are unlikely to come into contact with the notified chemical except in the case of a spill or container leak.

Formulation process operators may be exposed to liquids or solids containing <1% notified chemical. Exposure (dermal, inhalation or ocular) is most likely to occur when adding the product containing the notified chemical to mixing vessels. Exposure is limited by exhaust ventilation and PPE, including overalls, gloves, safety goggles and boots. Exposure during quality control is possible, but will be limited by PPE and the relatively small volume of samples taken. For formulation of the brewery cleaner, controls required to control exposure to the solution containing a high level of caustic soda will ensure low exposure to the notified chemical.

Packaging workers may be exposed to products containing <0.1% notified chemical. Containers are filled either by gravity feed or by pneumatic filling. Exposure will be limited by exhaust ventilation and PPE, including overalls, gloves, safety goggles and boots.

End users may be exposed to products containing up to 0.1% notified chemical, although in general the final concentration used for cleaning is <0.01%. Incidental dermal exposure to <0.1% notified chemical may occur through splashes or contamination of the outside of the packaging. There is the potential for low level albeit regular dermal and accidental ocular contact by the public with the notified polymer during use of cleaning products. Where products are applied using spray bottles or as a liquid stream, there is the potential for aerosol formation and inhalation exposure. Oral exposure could occur from residues of the cleaning products if used to wash food containers and utensils and if these articles are not rinsed after washing. It is expected that residues would be low, and transfer to ingested food would be even lower. Accidental oral exposure of young children to cleaning products is also possible. Gloves or eye protection may be worn during some cleaning tasks.

End users of the brewery cleaner will mainly be protected against exposure to the caustic cleaning solution via enclosed lines and systems. Adequate local and general ventilation is also expected to be used. Under these conditions exposure to the notified chemical will also be low.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Once imported, the notified chemical is transported to reformulation sites, where the notified chemical is blended with other ingredients and repackaged. From here, the formulated products containing the notified chemical will either be sold to end-users, or transported to other sites for repackaging into end-use containers. Environmental release may arise from accidental spills, during handling and transport, from equipment cleaning and maintenance, and from residues in import and intermediary

containers. It is expected that residual notified chemical in import containers will account for <1% of the total imported volume, and will either be incinerated or disposed of to landfill. It is expected that spills and washings will be disposed as trade-waste to sewer.

RELEASE OF CHEMICAL FROM USE

Given the nature of the products in which the notified chemical is used, it is expected that effectively the entire total imported volume will eventually be released to sewer after use. Residual notified chemical within end-use containers may account for 1% of the total imported volume, and this is expected to be disposed of to landfill.

5.5. Disposal

Apart from approximately 2% of the total imported volume, which is expected to be disposed to landfill, the remainder is expected to be disposed of to sewer after use, though the rate that this occurs will vary between uses.

5.6. Public exposure

Consumers may be exposed to products containing up to 0.1% notified chemical, although in general the final concentration used for cleaning is <0.01%. Incidental dermal exposure to <0.1% notified chemical may occur through splashes or contamination of the outside of the packaging. There is the potential for low level albeit regular dermal and accidental ocular contact by the public with the notified chemical during use of cleaning products. Where products are applied using spray bottles or as a liquid stream, there is the potential for aerosol formation and inhalation exposure. Oral exposure could occur from residues of the cleaning products if used to wash food containers and utensils and if these articles are not rinsed after washing. It is expected that residues would be low, and transfer to ingested food would be even lower. Accidental oral exposure of young children to cleaning products is also possible. Gloves or eye protection may be worn during some cleaning tasks.

6. PHYSICAL AND CHEMICAL PROPERTIES

Physical and chemical properties are not available for the notified chemical. Values given here are for Petro 11 powder, which contains <1% notified chemical and a complex mixture notified as STD/1088. The notified chemical is never isolated as such.

Appearance at 20ºC and 101.3 kPa Tan powder (amber liquid when in aqueous solution)

Melting Point/Freezing Point >124ºC

Remarks The melting point of analogous chemicals of lower MW is >124°C.

Density 1200 kg/m^3

Remarks No test report provided.

Vapour Pressure Not determined.

Remarks Expected to be low based on structure. Calculated by EPIWIN 3.12 from representative structure to be less than 10^{-9} kPa.

Water Solubility Soluble in water.

Remarks >100 g/L. No test report provided. Ecotoxicity reports indicate that Petro 11 is readily soluble at 1 g/L, but this minor component may be less soluble due to the presence of an alkyl chain.

Hydrolysis as a Function of pH Not determined

Remarks There are no hydrolysable functionalities in the notified chemical.

Partition Coefficient (n-octanol/water) Not determined

Remarks This cannot be readily tested given the surfactant nature of the notified chemical.

Adsorption/Desorption Not Determined

Remarks While soluble, it is expected that the notified chemical may potentially adsorb to soil, based upon its surfactant nature.

Dissociation Constant Not determined.

Remarks The pKa for benzene sulfonic acid is calculated to be –2.8.

Particle Size Not determined.

Flash Point >94ºC

Remarks From MSDS.

Flammability Limits Not expected to be flammable.

Remarks Based on flashpoint.

Autoignition Temperature Not determined.

Explosive Properties Not determined.

Reactivity Not determined.

7. TOXICOLOGICAL INVESTIGATIONS

Toxicology data for the notified chemical are not available. Toxicological data for an accompanying notified chemical (STD/1088) which contains the notified chemical at <1% is available. However, this chemical is a complex mixture and is not a sufficiently close analogue for read-across purposes.

8. ENVIRONMENT

8.1. Environmental fate

Data are available only for products in which the notified chemical is a minor (<1%) component.

8.1.1.a Ready biodegradability

TEST SUBSTANCE	Petro 22
METHOD	OECD TG 301 B Ready Biodegradability: CO_2 Evolution Test.
Inoculum	Primary clarifier supernatant from a primarily domestic STP.
Exposure Period	28 d
Auxiliary Solvent	Nil
Analytical Monitoring	
Remarks - Method	The test contained one control, one reference, and one treatment group, with two replicates per group. The reference group was dosed with sodium benzoate at a concentration of 20 mg C/L. The treatment group was dosed with test substance at a concentration of 20 mg C/L.

RESULTS

Test substance		*Sodium benzoate*	
Day	*% Degradation*	*Day*	*% Degradation*
2	5.0	2	56.0
5	22.1	5	75.3
9	31.3	9	97.2
13	41.0	13	96.8
16	43.1	16	96.4
20	44.4	20	97.3
23	47.2	23	98.9
26	48.4	26	101.1
29	49.1	29	101.3

Remarks - Results	The test substance evolved an average of approximately 49% of the maximum theoretical CO_2 production. Although significant degradation of the test substance was observed, the test substance may not be considered readily biodegradable since 60% of theoretical CO_2 production was not achieved within 28 days. The viability of the inoculum and validity of the test was supported by the reference substance, sodium benzoate, degrading an average of approximately 101%. The reference substance yielded approximately 75% of the theoretical maximum CO_2 by day 5 of the test, thereby fulfilling the criteria for a valid test.
CONCLUSION	While significant biodegradation of the test substance occurred, the criterion for ready biodegradable was not achieved. Therefore, the test substance is inherently biodegradable.
TEST FACILITY	Wildlife International (1995a)

8.1.1.b Ready biodegradability

TEST SUBSTANCE	Petro BA Liquid
METHOD	OECD TG 301 B Ready Biodegradability: CO_2 Evolution Test.
Inoculum	Primary clarifier supernatant from a primarily domestic STP.
Exposure Period	28 d
Auxiliary Solvent	Nil
Analytical Monitoring	
Remarks - Method	The test contained one control, one reference, and one treatment group, with two replicates per group. The reference group was dosed with sodium benzoate at a concentration of 20 mg C/L. The treatment group was dosed with test substance at a concentration of 20 mg C/L.

RESULTS

Test substance		*Sodium benzoate*	
Day	*% Degradation*	*Day*	*% Degradation*
2	2.2	2	59.45
6	30.45	6	77.85
9	41.05	9	83.7
12	46.65	12	92.8
15	46.1	15	95.25
20	50.2	20	97.2
23	51.55	23	98.35
26	52.95	26	98.85
29	53.75	29	99.75

Remarks - Results	The test substance evolved an average of approximately 54% of the maximum theoretical CO_2 production. Although significant degradation of the test substance was observed, the test substance may not be considered readily biodegradable since 60% of theoretical CO_2 production was not achieved within 28 days. The viability of the inoculum and validity of the test was supported by the reference substance, sodium benzoate, degrading an average of approximately 100%. The reference substance yielded approximately 78% of the theoretical maximum CO_2 by day 6 of the test, thereby fulfilling the criteria for a valid test.
CONCLUSION	While significant biodegradation of the test substance occurred, the criterion for ready biodegradable was not achieved. Therefore, the test substance is inherently biodegradable.
TEST FACILITY	Wildlife International (1995b)

8.1.1.c Primary biodegradability

TEST SUBSTANCE	Petro BAF
METHOD	Presumptive Shake-Flask Bacterial Culture Method of the Soap and Detergent Association (SDA).
Inoculum	Laboratory shake-flask activated sludge culture
Exposure Period	8 d
Auxiliary Solvent	Nil
Analytical Monitoring	
Remarks - Method	The bacterial culture was first adapted to the specific alkyl aryl sodium sulfonate detergent present in the Petro BAF sample, for which it was to be used later for evaluation of surfactant biodegradability during the 8-day shake-flask test. Test substance detergent was adapted to the activated sludge bacterial culture by subjecting it to a minimum of two 72-hour

bacterial transfers in a shake-flask medium containing 30 mg/L (on a 100%-active basis) of the detergent in the sample under test. A sterilised microbial growth-promoting basal medium containing 30 mg/L of the test substance was then aseptically inoculated with 10 mL/L of the microorganisms which had already been preadapted. The mixture in the flask was then loosely capped and incubated at 25-30°C and aerated by continuous agitation of the flask for 8 days.

Biodegradation was determined by measuring the reduction in methylene blue anionic-active substance (MBAS) from the shake-flask culture media, immediately after inoculation and again on the 7th and 8th days of the test period. Percent removal was calculated from the reduction in surfactant content. The result of the test was the average of the 7th and 8th day percent removals.

A blank flask control unit (containing all materials except the test substance was also run concurrently by the Shake-Flask procedure. Also, with each run, there was included one unit fed Dodecene-1 derived Linear Alkyl Sulfonate (LAS) as a control on sludge suitability and operating conditions.

RESULTS

Test substance	
Day	*% Degradation*
7	91.3
8	92.6

Remarks - Results

The test substance had an average percent MBAS removal of 91.9%. As the test substance was found to have a biodegradability value that exceeded 90% removal of MBAS, the test substance was considered to be adequately biodegradable and require no further testing according to SDA standards.

The result for dodecene-1 derived LAS was 98.8% removal thereby indicating the suitability of the activated sludge for use in this SDA procedure.

CONCLUSION

According to the SDA standards, the test substance is described as adequately biodegradable.

TEST FACILITY

United States Testing Company (1970)

8.1.2. Bioaccumulation

REMARKS

Test not performed. The notified chemical is unlikely to bioaccumulate as it is biodegradable and is unlikely to partition to fat, based upon the high water solubility.

8.2. Ecotoxicological investigations

Data are available only for products in which the notified chemical is a minor (<1%) component.

8.2.1. Acute toxicity to fish

TEST SUBSTANCE

Petro 11

METHOD

OECD TG 203 Fish, Acute Toxicity Test – Static, Imbalance Test.

Species

Murray River Rainbow Fish (*Melanotaenia fluviatilis*).

Exposure Period

96 h

Auxiliary Solvent	Nil
Water Hardness	Not Provided
Analytical Monitoring	Temperature, pH, conductivity and dissolved oxygen.
Remarks – Method	Treated Sydney tap water was used as the diluent water for the test. Treatment involved passing the water through sand and carbon filters before storage in epoxy lined concrete tanks. Prior to use in the bioassay, the stored waster was filtered through 5 µm carbon filter cartridges and finally UV sterilised. A stock solution of the chemical was prepared by dissolving the chemical in the treated water to give a concentration of 1 g/L. This solution was then appropriately diluted to produce concentrations of 10, 50, 100, 200, 400 and 800 mg/L for the conduct of the test. A diluent water control was also prepared. 4 replicates for each test concentration and control were prepared, containing 5 randomly selected fish each. This is an Imbalance Test (not defined) only and the NOEC and LOEC values were calculated, after appropriate transformation of data, using the ANOVA and Dunnetts test. The EC50 value was determined using the trimmed Spearmen-Karber Method.

RESULTS

Concentration mg/L		*Number of Fish*	*Percent Imbalanced*		
Nominal	*Actual*		*0 h*	*48 h*	*96 h*
0		20	0	5%	5%
10		20	0	5%	5%
50		20	0	5%	5%
100		20	0	15%	15%
200		20	0	35%	35%
400		20	0	100%	100%
800		20	0	100%	100%

EC50	211.3 mg/L at 96 hours.
LOEC	200.0 mg/L at 96 hours.
NOEC	100.0 mg/L at 96 hours.
Remarks – Results	Temperature of the solutions ranged between 22.4 and 26.6°C. Conductivity of the sample solutions ranged between 191.2 and 450.5 µS/cm. Overall, the pH values for the sample solutions ranged between 7.40 and 8.08. The percentage saturation of dissolved oxygen was maintained well above 60% in all sample solutions, which meets the requirements of OECD TG 203 for fish toxicity tests.

CONCLUSION — The test substance, Petro 11, is very slightly toxic (Mensink *et al*, 1995) to fish and is not classified according to GHS (United Nations, 2003).

TEST FACILITY — University of Technology, Sydney (2004)

8.2.2. Acute/chronic toxicity to aquatic invertebrates

TEST SUBSTANCE — Petro 11

METHOD — ESA SOP 101, based on USEPA (1993) – Static, non-renewal.

Species	*Ceriodaphnia cf dubia*
Exposure Period	48 hours
Auxiliary Solvent	Nil
Water Hardness	Not provided
Analytical Monitoring	Temperature, pH, conductivity and dissolved oxygen.
Remarks - Method	Dilute Mineral Water (DMW) was used as the diluent for the toxicity tests and as the culture medium for the culturing of the test organisms.

DMW was prepared 24-48 h prior to use by diluting Perrier mineral water to a concentration of 20% (vol/vol) with deionised water. A vitamin B12 and selenium supplement was added to the DMW to give final concentrations of 10 and 2 µg/L respectively.

Six concentrations of Petro 11 powder were prepared in 250 mL beakers by diluting a 100 g/L working stock with DMW and subsequently homogenising the test solutions. A positive control, using was conducted in parallel, using potassium chloride as the toxicant.

The EC50 estimates (with 95% confidence limits) were determined using the trimmed Spearman-Karber method. The NOEC and LOEC were determined by performing a Steels Many-one Rank Test for non-parametric data.

RESULTS

Concentration mg/L		*Number of D. magna*	*Number Immobilised*	
Nominal	*Actual*		*24 h*	*48 h*
0		20	0	0
6.25		20	0	0
12.5		20	0	2
25		20	0	6
50		20	7	11
75		20	6	13
100		20	10	15

EC50	95.2 mg/L at 24 hours (95% CI: 74.3-158.1 mg/L) 45.2 mg/L at 48 hours (95% CI: 31.7-64.5 mg/L)
LOEC	25.0 mg/L at 48 hours
NOEC	12.5 mg/L at 48 hours
Remarks - Results	The test substances was described as being readily soluble in DMW dilution water at 100 mg/L. Temperature of the solutions were held at 25±1°C. There were no reported deviations from the test protocol.

CONCLUSION — The test substance, Petro 11, was found to be harmful to *Ceriodaphnia cf dubia* (United Nations, 2003).

TEST FACILITY — Ecotox (2004)

8.2.3. Algal growth inhibition test

TEST SUBSTANCE — Petro 11

METHOD — OECD TG 201 Alga, Growth Inhibition Test.
USEAP Protocol, 1994.

Species	*Selenastrum capricornutum.*
Exposure Period	72 hours
Concentration Range	Nominal: 0, 0.4, 1.1, 3.3, 10, 30, 100 mg/L
Auxiliary Solvent	EDTA
Analytical Monitoring	
Remarks - Method	A primary stock solution of 10 g/L (w/v) Petro 11 was prepared in USEPA medium (+EDTA). This was diluted further to form a secondary stock of 1 g/L (w/v) Petro 11. The six test concentrations were subsequently prepared. After mixing well, 6 mL of each test solution was dispensed into 20 mL silanised glass scintillation vials (each in triplicate). Each vial was inoculated with $1.3X10^4$ cells/mL of a *Selanastrum* suspension.

Five concentrations of the reference toxicant copper (14.3 – 114.3 µg Cu/L) and a control were prepared in 50 mL USEPA (+EDTA) medium. The bioassay was acceptable if copper toxicity (IC50) was within the cusum chart limits and if growth rate in the controls was within the normal range for *Selenastrum* (2.0 ± 0.5 doublings/day).

The 72 h IC50, LOEC and NOEC values were calculated using ToxCalc Ver. 5.0.23 (Tidepool Software).

RESULTS

Growth		
IC50	*LOEC*	*NOEC*
mg/L at 72 h	*mg/L at 72 h*	*mg/L at 72 h*
>100	>100	100

Remarks - Results: The control growth rate criteria were satisfied, validating the test.

CONCLUSION: The test substance, Petro 11, was not toxic to the alga with no significant inhibition of algal growth at any concentration tested.

TEST FACILITY: CSIRO (2004)

8.2.4. Inhibition of microbial activity

REMARKS: This test was not performed. For naphthalene sulfonic acids the literature presents a 17 h EC50=133 mg/L (Greim, 1994).

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified chemical will be imported into Australia, where it will be reformulated with other ingredients to form household and industrial cleaners. Nearly all of the notified chemical may potentially be disposed of to sewer after use, with only small quantities, including that proportion remaining as residual in containers and from major spills, being disposed of to landfill.

In sewer, the notified chemical may associate with suspended particles and sediment. In landfill, the notified chemical is not expected to be highly mobile and may adsorb to soil, where over time it should slowly degrade through biotic and abiotic processes to simple carbon and nitrogen based compounds.

Based on the worst-case scenario of 100% notified chemical being released to the aquatic environment via the sewer, with nil removal, a predicted environmental concentrations (PECs) of the notified chemical have been calculated:

Amount entering sewer per year	1,000 kg
Number of days per year	365
National population	20.4 million
Litres per person	200 L
PEC_{River}	0.670 µg/L.
PEC_{Ocean}	0.067 µg/L.

STP effluent re-use for irrigation occurs throughout Australia. The agricultural irrigation application rate is assumed to be 1000 L/m^2/year (10 ML/ha/yr). The notified chemical in this volume is assumed to infiltrate and accumulate in the top 0.1 m of soil (density 1000 kg/m^3). Using these assumptions, irrigation with a concentration of 0.670 µg/L may potentially result in a soil concentration of approximately 6.7 µg/kg. Assuming accumulation of the notified chemical in soil for 5 and 10 years under repeated irrigation, the concentration of notified chemical in the applied soil in 5 and 10 years may be approximately 0.05 and 0.1 mg/kg respectively.

The potential for the notified chemical to bioaccumulate is low due to its high level of water solubility.

9.1.2. Environment – effects assessment

The results of the ecotoxicological studies indicate that the product containing the notified chemical as a minor (<1%) component is harmful to invertebrates (96 h LC50 = 45.2 mg/L). A PNEC has therefore been calculated using a safety factor of 100, resulting in PNEC = 452 µg/L. Assuming that the contributions to the toxicity of the product is shared equally by the components, the PNEC is >4.52 µg/L.

9.1.3. Environment – risk characterisation

The Risk quotient (RQ) values, where RQ = PEC/PNEC, for freshwater and marine receiving environments have been calculated for the "worst case" scenario, as shown in the table below.

Worst Case	PEC µg/L	PNEC µg/L	RQ
River	0.670	>4.52	<0.15
Ocean	0.067	>4.52	<0.02

As the RQ for both river and marine receiving waters are below 1.0, the proposed diffuse use of the notified chemical, at current expected import volumes, is unlikely to pose an unacceptable risk to the aquatic environment.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Exposure of workers involved in transport and storage of powders or liquids containing <1% notified chemical is only likely to occur in the event of accidental breach of containers.

Exposure of workers involved in reformulation activities will primarily occur during transfer of liquids or powders from the import containers to the mixing vessels. Local exhaust ventilation is used to control inhalation exposure to powders or aerosols and appropriate PPE is used to control inhalation, dermal and ocular exposure. Cleaning and maintenance of equipment can potentially result in exposure and is expected to be controlled by the use of appropriate PPE.

Packing of cleaning products would typically be automated and should result in limited worker exposure. QC testing should also result in limited exposure due to the low volumes of product tested.

Workers involved in use of the cleaning products can potentially be exposed. Exposure could be mainly dermal and could involve concentrations up to 0.1% for the undiluted form. After dilution to <0.01%, exposure can be dermal but, if sprayed, may also be via inhalation and may be ocular.

9.2.2. Public health – exposure assessment

The public may be exposed to <0.1% notified chemical in the undiluted form and <0.01% following dilution. Exposure will be mainly dermal but ocular and inhalation exposure may occur, particularly if the diluted product is sprayed.

9.2.3. Human health – effects assessment

The notified chemical is a minor component in a mixture which has been tested for various toxicological endpoints (see the accompanying notification STD/1088) and for which analogues were provided for other endpoints. The chemical notified as STD/1088 was classified as R22: harmful if swallowed; R41: risk of serious damage to eyes and R43: may cause sensitisation by skin contact. Although these data cannot be used for read-across, it is reasonable to conclude that the notified chemical at <1% does not contribute to the health hazard of the chemical notified as STD/1088.

Based on the available data, the notified chemical is cannot be classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

9.2.4. Occupational health and safety – risk characterisation

As the hazard of the notified chemical is unknown, the risk will mainly derive from the fact that the highest concentration of the notified chemical is in the imported products at <1%. At this concentration the notified chemical would not be expected to contribute to the hazards of Petro products. Reformulation of Petro products can result in exposure to the notified chemical at 0.1% and in use, 0.01%. Therefore, the health risk from importation, transport, storage, reformulation and use of the notified chemical is considered to be low.

9.2.5. Public health – risk characterisation

The public should only come into contact with the notified chemical at <0.1% and therefore, the risk of using cleaning products containing it is low.

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

10.1. Hazard classification

Based on the available data the notified chemical cannot be classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances.*

and

As a comparison only, the classification of notified chemical using the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations, 2003) is presented below. This system is not mandated in Australia and carries no legal status but is presented for information purposes. With respect to the environment, the product containing the notified chemical is classified as Chronic Category 3.

10.2. Environmental risk assessment

On the basis of the PEC/PNEC ratio:

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

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

There is No Significant Concern to public health when used as described.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of products containing the notified chemical provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 2003). They are published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for products containing the notified chemical provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified chemical 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.

Disposal

- The notified chemical should be disposed of by incineration or to landfill.

Emergency procedures

- Spills/release of the notified chemical should be physically contained, collected and disposed of in an appropriate manner.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(2) of the Act:

- if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

Ecotox (2004) The Acute Toxicity of Petro 11 Powder to *Ceriodaphnia dubia*, TR0152/1, Ecotox Services Australasia Pty Ltd, Unit 27/2 Chaplin Drive, Lane Cove, NSW 2066.

Greim H *et al.* (1994) Toxicity and Ecotoxicity of Sulfonic Acids: Structure-Activity Relationship, Chemosphere, Vol 28, No 12, pp 2203-2236, 1994.

Mensink BJWG, Montforts M, Wijkhuizen-Maslankiewicz L, Tibosch H and Linders JBHJ (1995) Manual for summarising and evaluating the environmental aspects of pesticides. National Institute of Public Health and Environmental Protection, Bilthoven, The Netherlands. Report No. 679101022.

NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

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

NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2nd edn [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

United Nations (2003) Globally Harmonised System of Classification and Labelling of Chemicals (GHS). United Nations Economic Commission for Europe (UN/ECE), New York and Geneva.

United States Testing Company, Inc. (1970) Evaluation Of A Sample Of 'Petro BAF' Powder, Identified As An Alkyl Aryl Sodium Sulfonate Surfactant, For Biodegradability By The Presumptive Shake-Flask Culture Test Procedure Of The Soap And Detergent Association, Report No. 38655, United States Testing Company, Inc., 1415 Park Avenue, Hoboken, New Jersey.

University of Technology, Sydney (2004) Toxicity of Petro 11 to Juveniles of the Murray River Rainbow Fish, *Melanotaenia fluviatilis*. Ecotoxicology Unit, Dept Environmental Sciences, University of Technology, Sydney, PO Box 123, Broadway, NSW 2007.

Wildlife International (1995a) Modified Sturm Screening Test, Petro 22, Project No. 344E-101, Wildlife International Ltd, 8598 Commerce Drive, Easton, Maryland 21601.

Wildlife International (1995b) Modified Sturm Screening Test, Petro BA, Project No. 344E-102, Wildlife International Ltd, 8598 Commerce Drive, Easton, Maryland 21601.