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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Notified Chemical in Mortrace MP

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Notified Chemical in Mortrace MP

1. APPLICANT

Petrofin International Pty Ltd of 10th Floor 350 Kent St SYDNEY 2000 has submitted a standard notification statement in support of their application for an assessment certificate for Notified Chemical in Mortrace MP.

2. IDENTITY OF THE CHEMICAL

Trade Name: Mortrace MP (contains 40% on the notified chemical)

Method of Detection and Determination: no spectral data provided

3. PHYSICAL AND CHEMICAL PROPERTIES

The physico-chemical properties listed below are for the formulation to be imported containing 40% of the notified chemical, 30% oleic acid and 30% (polyethyl) benzenes except where indicated

Appearance at 20^0C and 101.3 kPa: light brown wax-like paste (notified chemical)

Boiling Point: 238^{o}C

Specific Gravity: 0.96

Vapour Pressure:	<0.27 kPa
Water Solubility:	insoluble
Partition Co-efficient (n-octanol/water):	log $P_{O/W}$= 3.6 - 6.6
Hydrolysis as a Function of pH:	not determined (see comments below)
Dissociation Constant:	not determined (see comments below)
Flash Point:	not determined
Flammability Limits:	not flammable
Autoignition Temperature:	not determined
Explosive Properties:	not explosive

Comments on Physico-Chemical Properties

Data for the hydrolysis, adsorption/desorption and dissociation constant have not been provided for the notified chemical. It is expected that test reports and results for these data as well as water solubility and partition coefficient, or scientific argument detailing why test data are not required, will be provided with the secondary notification of the chemical.

The notified chemical contains no functional groups likely to undergo hydrolysis in the environmental pH range and the amine functionalities within the chemical are expected to have typical basicities. However, these will need to be confirmed.

4. PURITY OF THE CHEMICAL

Degree of Purity:	99.3%
Toxic or Hazardous	none
Impurities:	none
Non-hazardous Impurities (>1% by weight):	none
AdditiveslAdjuvants:	none

5. USE, VOLUME AND FORMULATION

The notified chemical is to be imported at a rate of 12 to 1 5 tonnes per year for the first five years as a 40% solution containing 30% oleic acid and 30% (polyethyl) benzenes.

The use is as a marker of concessionally taxed fuels and solvents to test for adulteration of non-concessionally taxed fuels. Diesel fuel, distillate, leaded or unleaded petrol will not have the marker added unless specifically cleared for other than on-road use.

Fuels exempted from marking are:

- any fuels cleared for home consumption in a packaged state;
- fuel oil which is coloured black;
- aviation turbine fuel; and
- aviation gasoline

Also exempted are solvents for application or use in the following industries:

- foodstuffs;
- pharmaceuticals;
- oil seed extraction;
- paint, varnish and ink manufacturing;
- mining industry where 100% purity is required;
- adhesives; and
- resins

The industries which will be using marked product are most likely to be:

- home heating/lighting and industrial heating;
- rubber manufacturing, including tyres;
- plastics manufacturing; and
- chemical manufacturing

The petroleum products to be marked are: benzole, benzene, toluole, toluene, xylole, xylene, naphthenic and similar oils, condensate other than for use as a refinery feedstock, crude oil other than for use as a petroleum feedstock, topped crudes other than for use as a petroleum feedstock, diesel fuel, heating oil, kerosene, gasoline, mineral turpentine, liquied parafin, waster oil, white oil, naphthenic distillates and solvents under the tariff description of “other refined or partly refined petroleum prouducts other than lubricants.

6. OCCUPATIONAL EXPOSURE

The notified chemical will be imported in 200 L and 20 L steel drums.

The notified chemical will be metered into fuel to a final concentration of 20 ppm by at least three methods as disclosed by three oil companies.

One company proposes to send 200 L drums to a contractor who will dispense the imported formulation into 100 or 200 mL bottles. The contractor has specific systems in place for this purpose involving a pump connected to an automatic bottle filling line. Exposure to a limited residue on the drum bung and from connecting lines is possible. It is stated that there should only be a thin film of residue in lines following bottle filling. The bottles will be manually tipped into tankers by the drivers with a small chance of spillage.

An alternate approach for larger terminals will be to attach a pump to the 200 L drum directly to injection equipment. In this case exposure to a limited amount of residue on bungs and in pump lines and injection equipment lines is possible. A similar method by a second company will involve use of 20 L drums in which case the imported formulation will be pumped to a storage tank connected to injection equipment. Again limited exposure to residues on drum bungs and in lines is possible.

In a third case the 20 L drum will be decanted manually into a storage tank connected to injection machinery. Here there is some likelihood of accidental spillage which may lead to ocular or dermal exposure.

Empty drums will be collected and cleaned by a licensed drum reconditioner. Exposure in this instance is expected to be low.

7. PUBLIC EXPOSURE

The notified chemical will not be directly available to the public, and most members of the public will not come into contact with concessionally taxed fuels treated with the marker. Where the public does gain access to concessionally taxed fuels, such as heating oils and mineral turpentine, the low concentration of the additive (20 ppm) will result in negligible exposure levels to the notified chemical.

Transport of the Mortrace MP additive is unlikely to result in significant public exposure in the event of an accident as the material is a wax-like paste, is insoluble in water, and has a low vapour pressure (<0.27 kPa). During a transport accident the hazard presented by a spill of the bulk fuel or solvent treated with Mortrace MP, and the subsequent risk to the public, will greatly outweigh any risk presented by the Mortrace MP additive itself.

Addition of Mortrace MP to fuel is accomplished by either pouring the required quantity directly into a fuel tanker or injecting it into filling lines. In either case the small quantities required in each operation, the non-volatile nature of the Mortrace MP product, and the buffer zones and safety procedures required for bulk handling of petroleum products, will prevent public exposure to the notified chemical from its industrial application.

8. ENVIRONMENTAL EXPOSURE

Release

The majority imported product, Mortrace MP, will be added to the fuels and solvent products using automated additive injection equipment and release through this process is expecte≤to be limited to the terminal where spills will be adsorbed onto clay or sawdust and disposed of in accordance with local, state and federal regulations either at an authorised incinerator or waste treatment facility.

The 1 00 and 200 mL bottles will be used to mark tanker loads directly. The contents of the bottles will be emptied into the tanker directly.

The Material Safety Data Sheet (MSDS) recommends that of the currently available methods of disposal of used containers an alternative be selected according to the following order of preference, based upon environmental

acceptability: (i) recycle or rework, if feasible; (ii) incinerate at an authorised facility; or (iii) treat at an acceptable waste treatment facility.

The Australian Customs Service has indicated that marked solvent products would be unlikely to be sold to the general public.

Fate

The fate of the majority of the notified chemical will share the fate of the fuels or solvents into which it is incorporated.

It is anticipated that combustion of fuels containing the notified chemical will also result in the combustion of the notified chemical. Any combustion of the notified chemical is expected to result in its decomposition and release of water and oxides of carbon and nitrogen. Hence, limited environmental exposure of the notified chemical is expected from this use.

There appears to be considerable potential uses where combustion will not take place. For example, no details of the environmental exposure from use and disposal of solvents containing the notified chemical have been provided. The chemical will be incorporated into these solvents at a low concentration and it is anticipated that because of their nature waste solvents will be collected and disposed of through licensed liquid waste contractors. Again this needs confirmation.

No data on the biodegradation has been provided by the notifier and it is expected that this will be provided with the secondary notification. The MSDS for the product indicates, based on the partition coefficient, that it has the potential to bioaccumulate in aquatic organisms. Again the degree of this will depend on the extent of exposure to the aquatic compartment.

9. EVALUATION OF TOXICOLOGICAL DATA

9.1 Acute Toxicity

Summary of the acute toxicity of the notified chemical in Mortrace MP

Test	Species	Outcome	Reference
acute oral toxicity	rat	LD_{50} = 6.77 $g.kg^{1}$	(1)
acute dermal toxicity	rat	LD_{50}> 2.0 $g.kg^{1}$	(2)
skin irritatioin	rabbit	slight irritant	(3)
eye irritation	rabbit	slight irritation	(4)

9.1.1 Oral Toxicity *(1)*

Species/strain. rat/Sprague-Dawley

Number/sex of animals: 5/sex/dose

Doses: 3.50, 4.49, 5.77, 7.40, 9.50 $g.kg^{-1}$

Observation period: 14 days

Method of administration. gavage

Clinical observations and Mortality:

Dose ($g.kg^{1}$):	**3.50**	**4.49**	**5.77**	**7.40**	**9.50**
Clinical observations:					
decreased activity	7/10	10/10	10/10	10/10	10/10
ataxia	7/10	4/10	6/10	10/10	3/10
diarrhea	10/10	9/10	8/10	8/10	
Mortality:	0/10	1/10	5/10	4/10	9/10

Test method:	according to OECD guidelines (5)
LD_{50}:	>5 $g.kg^{1}$
Result:	the notified chemical was of low acute oral toxicity in rats

9.1.2 Dermal Toxicity (2)

Species/strain:	rabbit/NZW
Number/sex of animals:	3/sex
Observation period:	14 days
Method of administration:	$2g.kg^{-1}$ of the notified chemical was applied to the exposed skin of each rabbit under occlusive dressing for 24 hours
Clinical observations:	none
Mortality:	none
Morphological findings:	none
Test method:	according to OECD guidelines
LD_{50}	$LD_{50}>2.0gkg^{-1}$
Result:	the notified chemical was of low dermal toxicity in rats

9.1.3 Inhalation Toxicity

not determined

9.1.4 Skin Irritation (3)

Species/strain:	rabbit/NZW
Number/sex of animals:	6
Observation period:	*72 hours*
Method of administration:	0.5 mL under occluded dressing for 24 hours

Draize scores (Ref):

Time after treatment (days)	***Animal #***					
	1	***2***	***3***	***4***	***5***	***6***
Erythema						
1	2[a]	1	2	1	1	2
2	1	0	0	0	0	1
3	0	0	0	0	0	0

Oedema no scores above zero

[a]see Attachment 1 for Draize scales

Test method: according to OECD guidelines (5)

Result: none

9.1.5 Eye Irritation (4)

Species/strain: rabbit/NZW

Number/sex of animals. 6 (one animal died on day 5 due to non-treatment related causes)

Observation period 7 days

Method of administration. 0.1 mL of the notified chemical into the conjunctival sac of one eye

Test method: according to OECD guidelines (5)

Result: the notified chemical was a slight eye irritant in rabbits; no cornea or iridal effects were seen up to 7 days post instillation; the only conjunctival effects seen were slight redness and chemosis at the 1 hour time point in all animals

9.1.6 Skin Sensitisation

not determined

9.2 Repeated Dose Toxicity not determined

9.3 Genotoxicity

9.3.1 *Salmonella typhimurium* Reverse Mutation Assay (6)

Strains:	TA 1535, TA 1537, TA 1538, TA 98 and TA 100
Concentration range:	100 - 10000 µ.g.plate^{-1}
Test method:	similar to OECD guidelines (5)
Result:	the notified chemical exhibited toxicity towards strains TA 98 and TA 100 at 3333 and 10000µg.plate^{-1}; the notified chemical was not mutagenic in the system either in the presence or absence of metabolic activation provided by rat liver S9 fraction

9.4 Overall Assessment of Toxicological Data

The notified chemical was of low acute oral (LD_{50}> 5 000 mg.kg^{-1}) and dermal (LD_{50}> 2 000 mg.kg^{-1}) toxicity in rats and rabbits, respectively. It was a slight skin and eye irritant and was non-mutagenic in *Salmonella typhimurium.* It would not be classified as hazardous according to the National Commission's *Approved Criteria for Classifying Hazardous*

However, the notified chemical is only commercially available as Mortrace, a mixture of the notified chemical, oleic acid and naphtha. This formulation would be classified as hazardous according to the National Commissions *Approved Criteria for Classifying Hazardous Substances,* based on the skin and eye irritation potential of naphtha and its ability to cause lung damage with chronic exposure.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicity studies have been supplied by the notifier. It is expected that these will be supplied with the secondary notification. The imported product is referred to as a marine pollutant in the Material Safety Data Sheet (MSDS).

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

A preliminary assessment of the notified chemical indicates that the use of the chemical will be widespread at low levels. Limited environmental release of the imported product, Mortrace MP, is likely to occur prior to adding to the fuels or solvents. Notified chemical which is incorporated into fuels will undergo combustion to yield water and oxides of carbon and nitrogen. The fate of chemical incorporated into non-combusted products such as solvents for use by industry is unclear. Waste solvents are likely to be disposed of through liquid waste contractors.

Without a better environmental exposure profile and aquatic toxicity data of the notified chemical it is not possible to comment on the effect on aquatic organisms or conduct a proper environmental hazard assessment. However, it does appear from a preliminary assessment that little release to the aquatic compartment from its proposed uses will occur.

On the basis of the supplied information it appears that the potential environmental hazard will be low. However, considerable gaps exist in the data provided including the potential environmental exposure profile. The chemical is subject to secondary notification in six months time at which time it is expected that outstanding information will be provided.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified chemical will be imported in 20 L or 200 L drums at a concentration of 40% in oleic acid and aromatic hydrocarbon solvent. Exposure of transport and storage workers is unlikely except in the event of an accident.

A number of methods, as described in the section on occupational exposure, will be employed to add the notified chemical in Mortrace MP to fuels and solvents. Dermal exposure and, to a lesser extent, ocular exposure to residues in lines, on line connectors and on drum bungs, is possible. Exposure to spills when decanting small bottles on 20 L drums is also possible. Thus gloves, goggles, clothing and footwear as described below should be worn during decanting, cleaning up of spillages and cleaning of lines and connectors. The risk to workers of acute toxic effects, skin and eye irritancy and genotoxicity is expected to be low based on animal data. The risk of skin sensitisation and chronic toxic effects is unknown at present. However, it should be noted that most operations are of short duration.

The imported formulation contains oleic acid and solvent naphtha so there is a risk of eye and skin irritation and acute toxic effects if swallowed (see MSDS).

Customs inspectors testing fuel for adulteration should only be exposed to at most 8 ppm of the notified chemical. Consequently the risk of adverse health effects due to the notified chemical are negligible.

The general public may be exposed to fuel marked with the notified chemical. However, at 8 ppm public exposure is negligible and consequently so is the risk of adverse health effects.

The notified chemical is likely to be of low acute toxicity and may be a slight skin and eye irritant. It is unlikely to be mutagenic on the basis of a bacterial study. Skin sensitisation and repeat dose toxicity studies have not been conducted.

13. RECOMMENDATIONS

To minimise occupational exposure to the notified chemical when removing and reinserting drum bungs, removing and cleaning pumps, cleaning injection equipment and decanting, the following personal protective equipment should be worn:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1 336 (8) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (9);

- Industrial clothing should conform to the specifications detailed in AS 2919(10);

- Impermeable gloves or mittens should conform to AS 2161 (11);

- All occupational footwear should conform to AS/NZS 2210 (12);

- Spillage of the notified chemical should be avoided, spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal; following tipping of the contents of the 100 and 200 mL bottles containing the formulation to be imported into tankers, the empty bottles should be returned to their source for reuse;

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

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

All labels on formulations containing greater than 1 % of the notified chemical should carry the risk phrases: “May cause sensitisation by skin contact” and “Danger of serious damage to health by prolonged exposure”.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the formulation to be imported containing the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (13).

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

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise.

Under section 64(1) of the Act, secondary notification of the notified chemical shall be required if the amount of chemical imported rises above 20 tonnes or at 6 months from the date of the assessment certificate or when the outstanding mammalian toxicological and environmental studies required for a standard notification become available.

For secondary notification, the notifier will be required to submit the following:

- Results and full test reports for the listed physical and chemical data as per Part B, Section 9 of the Schedule. These should include Boiling Point, Density, Vapour Pressure, Water Solubility, Hydrolysis, Partition Coefficient, Adsorption/Desorption and Dissociation Constant. In the absence of such test reports and results for the above, the notifier should provide satisfactory scientific argument to justify their omission.

- The notifier is required to address Part C, Sections 4, 5 and 6 of the Schedule.

This should include results and full reports for fish, daphnia, algae and ready biodegradability testing. In the absence of such test reports and results for the above, the notifier should provide satisfactory scientific argument to justify their omission.

- Estimates of the quantity of the notified chemical to be imported over the succeeding four years is required under Part B, Section 5 of the Schedule.

- Details of the approximate volumes to be used in the various industries are required, including the quantity of imported product to be repackaged into 1 00 and 200 mL bottles.

- Estimates of the quantity and method of use and disposal of solvents etc. containing the notified chemical which are not combusted is requested for each industry in which marked solvents will be used. This should include details of the potential environmental exposures of the marker from such use.

16. REFERENCES

1. Reagan, EL. 1981, *Acute Oral LD5O Assay in Rats,* Project no., 7090A, Food and Drug Research Laboratories Inc.

2. Reagan, EL. 1981, *Acute Dermal Toxicity Study in Rats,* Project no., 7090A, Food and Drug Research Laboratories Inc.

3. Reagan, EL. 1981, *Primary Dermal Irritation/Corrosivity in Rabbits,* Project no., 7090A, Food and Drug Research Laboratories Inc.

4. Reagan, EL. 1981, *Acute Eye Irritation/Corrosivity in Rabbits,* Project no., 7090A, Food and Drug Research Laboratories Inc.

5. Organisation for Economic Co-operation and Development 1995-1996 *OECD Guidelines for the Testing of Chemicals on CD-Rom,* OECD, Paris.

6. Godek, E.G. 1983, *Ames Salmonella/Microsome Assay,* Project no., 301-fd-021-83, Pharmakon Research International Inc.

4. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(1994)],* Australian Government Publishing Service, Canberra

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

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

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

11. Standards Australia 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding electrical and medical gloves),* Standards Association of Australia, Sydney.

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

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

Attachment I

The Draize Scale for evaluation of skin reactions is as follows:

Erythema Formation	*Rating*	*Qedema Formation*	*Rating*
No erythema	0	No aedema	0
Very slight erythema (barely perceptible)	1	Very slight cedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

CORNEA

Opacity	*Rating*	*Area of Cornea involved*	*Rating*
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 500/o	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

CONJUNCTIVA E

Redness	*Rating*	*Chemosis*	*Rating*	*Discharge*	*Rating*
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Svielling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

IRIS

Values	*Rating*
Normal	0 none
1 slight	
No reaction to light, haemorrhage, gross destruction	2 severe