

File No: NA/176

Date: 19 December, 1994

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**TRASAR 23299**

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act 1989*, and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment, Sport, and Territories and the assessment of public health is conducted by the Department of Human Services and Health.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, Worksafe Australia, 92-94 Parramatta Road, Camperdown NSW 2050, between the hours of 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

For Enquiries please contact the Administration Coordinator at:

*Street Address:* 92 Parramatta Rd Camperdown, NSW 2050, AUSTRALIA

*Postal Address:* GPO Box 58, Sydney 2001, AUSTRALIA

*Telephone:* (61) (02) 565-9466 **FAX (61) (02) 565-9465**

Director  
Chemicals Notification and Assessment

**FULL PUBLIC REPORT****TRASAR 23299****1. APPLICANT**

Nalco Australia Pty Ltd of 2 Anderson Street, Botany NSW have submitted a limited notification for TRASAR 23299.

**2. IDENTITY OF THE CHEMICAL**

Based on the nature of the chemical and the data provided, TRASAR 23299 is considered to be non-hazardous. Therefore, the identity has been exempted from publication in the Full Public Report and the Summary Report.

**Trade names:** TRASAR 23299 or (AKA) Diagnostic Trasar R4222  
(10% solution for Internal Use only)  
TRASAR 23263, (0.334% solution, Dispersant for Trade)

**Method of detection and determination:**

Fourier Transform Infrared Spectroscopy, in-line fluorometry.

**3. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance at 20°C and 101.3 kPa:</b>	Green liquid
<b>Odour:</b>	Mild
<b>Boiling Point:</b>	Not known but expected to be high.
<b>Density:</b>	1.11 kg/L
<b>Vapour Pressure:</b>	TRASAR 23299 contains a non volatile salt. The vapour pressure of its aqueous solutions is expected to be the same as for water.
<b>Water Solubility:</b>	Completely soluble.
<b>Partition Co-efficient (n-octanol/water) log P<sub>o/w</sub>:</b>	Not determined, but expected to be low.
<b>Hydrolytic Stability:</b>	Stable from pH 0 to > 13.
<b>Adsorption/Desorption:</b>	No sorptive tendencies are evident. No measurable adsorption occurred when the tracer (0.1 ppm) was stirred for two days with a suspension (800 ppm) of particulate iron salts.
<b>Dissociation Constant:</b>	TRASAR 23299 will essentially be completely dissociated in aqueous solution.

<b>Flash Point:</b>	> 93.3°C
<b>Flammability Limits:</b>	Not flammable
<b>Combustion Products:</b>	CO and SO <sub>x</sub> fumes
<b>Decomposition Temperature:</b>	Not provided.
<b>Decomposition Products:</b>	Not provided
<b>Autoignition Temperature:</b>	None
<b>Explosive Properties:</b>	None
<b>Reactivity/Stability:</b>	Stable but may react with strong oxidisers.

#### **4. PURITY OF THE CHEMICAL**

**Degree of purity:** ~ 100 %

**Toxic or hazardous impurities:** none

**Non-hazardous impurities (> 1% by weight):** Less than 0.2% sediment.

**Additives/Adjuvants:** None

#### **5. INDUSTRIAL USE**

The notified chemical will be introduced as a 10% aqueous solution known as TRASAR 23299 (diagnostic tracer) and will be reformulated and sold as 0.334% constituent of TRASAR 23263 Dispersant.

TRASAR 23299 will be used by Nalco Cooling Water System Service personnel as a diagnostic tool. It acts as a tracer to assist in the determination of the volume of water in a cooling system, the number of cycles at which a system is functioning and the flow rate through various parts of the system. The dosage depends on water quality and will usually range from 5 to 10 ppm TRASAR 23299 but may reach 100 ppm. This translates to a maximum of 10 ppm of the notified ingredient.

TRASAR 23263 will be made available to non Nalco personnel but will be primarily used as part of a two product system for use in corrosion control of evaporative recirculating cooling towers used as heat rejection systems for air conditioning. The dye will be added to enable the accurate automatic control of product dosage. The dosage depends on water quality and will range from 20 to 150 ppm of TRASAR 23263 which translates to 0.067 to 0.5 ppm of the notified ingredient. It is anticipated that TRASAR 23263 will be used only in large industries such as metal processing, aluminium, alumina, pulp and paper, chemicals refinery and manufacturing plants due to the high cost of necessary monitoring equipment.

The notified chemical has been used in the United States for several years and no cases of work related diseases have been reported.

## **6. OCCUPATIONAL EXPOSURE**

The estimated import volume of the notified chemical is 117 kg/year in the first year increasing to 317 kg/year in 5 years time.

Approximately 65 Nalco personnel will be handling the 10 % notified chemical solution in differing capacities.

Four workers will draw samples of TRASAR 23299 from imported 200 L drums and 20 L pails for quality control checks. This procedure takes 1/2 hour during each of the quarterly deliveries. Storage, despatch and transport workers will not be exposed as they will be handling only sealed containers. The reformulated commercial product TRASAR 23263 will be transported in 700 L and 1500 L stainless steel intermediate bulk containers. Laboratory staff will be exposed to the notified chemical for 1/2 hour during each batch delivery (one per quarter) and a further 2 hours per quarter for research and development.

During product reformulation the TRASAR 23299 is transferred from a 200 L drum using a siphon tube and transfer pump, through a meter. The notified chemical is diluted in a blender under slight negative pressure with other ingredients to make the commercial product. The TRASAR 23299 is top charged into a vessel through the manhole via hosing connected to a geared pump. Local exhaust ventilation is used. Two personnel will be involved in this process for 1-2 hours per day on four occasions per year.

Three maintenance workers are exposed to negligible quantities of TRASAR 23299 as the vessels will be flushed with water prior to work.

Workers with the most potential for exposure are the application staff. Forty workers are involved in dosing of the product into air conditioning water systems for 600 hours per year per person. A controlled quantity of TRASAR 23299 will be added to the cooling water via a pump. Samples of cooling water are taken at various times and locations and measurements made on site with a fluorometer. Vapours and aerosols may be produced and an organic vapour respirator is recommended for these situations.

All workers exposed directly to the notified chemical use safety glasses, overalls and gloves as necessary.

## **7. PUBLIC EXPOSURE**

TRASAR 23299 will be used only by Nalco Service personnel and the marketed product TRASAR 23263 is likely to be used only by large industry. In the case of accidental spillage during transport, the public may be exposed to the notified chemical. This is minimised by the recommended practices for storage and transportation. Emergency procedures for the containment and clean up of accidental spills are available and should be followed.

## **8. ENVIRONMENTAL EXPOSURE**

### **. Release**

Formulation of imported TRASAR 23299 to the commercial product TRASAR 23263 is a simple blending process that will take place at the notifier's Botany facility. It is anticipated that formulation will release 0.34 kg of the tracer to plant effluent on one day of the year. The effluent treatment plant at the formulation site turns over 200 000 L of waste water per day and sends treated waste via the sewer to Malabar Sewage Treatment Works.

## **Use**

TRASAR 23263 is typically dosed to cooling towers at 20-150 ppm, which equates to 0.067 to 0.5 ppm of the notified substance. Release of cooling water containing the notified substance may occur via drift (small droplets entrained in cooled air), leaks, or blowdown (removal of liquid to avoid excessive build up of naturally occurring salts in cooling water). Total annual release of cooling water from cooling towers around Australia is estimated at 20 million tonnes (10% as drift and the remainder as blowdown) of which less than 5% is expected to be treated with TRASAR 23263. Liquid effluents at industrial locations are expected to be contained on-site before discharge to sewer, either directly or via effluent treatment plants. City buildings are legally required to connect to sewer for such discharge, but some are still being converted from stormwater.

Diagnostic studies to be conducted by the notifier will usually involve concentrations below 1 ppm, but occasionally reaching 10 ppm.

## **Fate**

The notified substance will be discharged at a maximum concentration of 0.5 ppm in aqueous effluent from cooling towers, or at a maximum concentration of 10 ppm following diagnostic studies by the notifier. Stability with respect to reaction with other species in the cooling water or metabolism by bacteria is a functional requirement of the tracer. Resistance to biodegradation was confirmed in screening tests using a semi-continuous activated sludge system, in which no significant removal of dissolved organic carbon or evolution of carbon dioxide was observed.

Given the lack of sorption or biodegradation in screening tests, the tracer is expected to pass through sewage treatment plants unchanged and enter aquatic environments. Water soluble dyes with similar chemical structures have been found to pass through activated sludge processes without substantial change (1).

Bioaccumulation of this hydrophilic substance is not expected.

## **9. EVALUATION OF TOXICOLOGICAL DATA**

### **9.1 Overall Assessment of Toxicological Data**

According to the *Act* toxicity data is not required for a chemical introduced at < 1 tonne per year. Nalco Australia Pty Ltd have, however, provided summaries of some toxicity data for a chemical with a similar structure to TRASAR 23299. Structurally similar chemicals have been reported as having inactive carcinogenic activity when painted on mouse skin (3). Toxicity studies performed on one structurally similar substance found an intravenous mouse LD<sub>50</sub> of 1050 mg/kg (4). Although no skin irritation studies were reported, the notified chemical may be expected to be a skin irritant.

## **10. ASSESSMENT OF ENVIRONMENTAL EFFECTS**

While environmental effects data are not required for limited notifications, the notifier has provided test reports for studies on rainbow trout, fathead minnow and *Daphnia magna* (5-7). Tests were conducted for 96 h on fish and 48 h on daphnids, under static unaerated conditions. In each case, the LC<sub>50</sub> was in excess of 1000 mg.L<sup>-1</sup> (of the 10% solution used as test substance) and no sub-lethal effects were observed. The tracer is practically nontoxic to aquatic fauna, consistent with reports for other similar chemicals (2).

The few data available concerning the toxicity of similar chemicals to algae indicate no more than slight algal toxicity (2).

## **11. ASSESSMENT OF ENVIRONMENTAL HAZARD**

Concentrations of the new substance discharged in blowdown effluent will not exceed 0.5 ppm, more than two orders of magnitude below aquatic no-effect levels of 100 mg.L<sup>-1</sup>, the highest concentration to which test organisms were exposed. Maximum concentrations to be discharged to sewer following diagnostic studies by the notifier are also well below this threshold.

Formulation wastes discharged to Nalco's effluent treatment plant would be diluted in the daily flow from the plant to a concentration of 1.7 mg.L<sup>-1</sup>. Passage through Malabar (daily flow 500 ML) would dilute this further to 0.7 µg.L<sup>-1</sup>.

The predicted environmental hazard is low.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

TRASAR 23299, a 10% solution of the notified chemical, has a vapour pressure equivalent to water, is hydrophilic, stable and non-flammable. It is therefore unlikely to be inhaled or to accumulate in biological tissues. Inhalation exposure will be possible only if the generation of mists and aerosols occurs.

No toxicity data were available for the notified chemical, but literature information on structurally similar chemicals suggest that it is unlikely to be a carcinogen to mouse skin, and is moderately toxic when administered intravenously to the mouse. Like other similar chemicals it may be an irritant to the skin. Skin and eye contact should therefore be avoided.

Exposure of the workers to TRASAR 23299 will be minimal. Apart from the end users, low numbers of personnel will be exposed for small periods of time on several occasions per year. Closed systems will be used during formulation, thus reducing exposure. Personnel testing water cooling systems use only small amounts of the Trasar which contains only a maximum of 10% of the notified chemical. During sampling the concentration of the tracer amounts to only 150 ppm. The generation of aerosols is possible during the use and in such cases a suitable respirator has been recommended.

Therefore, in light of the physico- chemical features of the chemical, its toxicity profile and expected low exposure to the chemical, the risk to those who work with the notified chemical and the general public will be minimal.

## **13. RECOMMENDATIONS**

To minimise occupational exposure to TRASAR 23299 the following guidelines and precautions should be observed:

- . If engineering controls and work practices are insufficient to significantly reduce exposure to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for organic vapour respirator (AS 1715, AS 1716) (8,9), chemical goggles (AS 1336; AS 1337) (10,11), impermeable gloves (AS 2161) (12) and overalls should be worn.
- . Good work practices should be implemented to avoid splashing or spillages and generation of aerosols.
- . Good personal hygiene should be adopted.
- . A copy of the MSDS for TRASAR 23299 and products containing it, such as TRASAR 23263, should be easily accessible to employees.

#### **14. MATERIAL SAFETY DATA SHEET**

The attached Material Safety Data Sheet (MSDS) for TRASAR 23299 was provided in Worksafe Australia format (13).

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

#### **15. REQUIREMENTS FOR SECONDARY NOTIFICATION**

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of TRASAR 23299 shall be required if any of the circumstances stipulated under subsection 64(2) of the *Act* arise. No other specific conditions are prescribed.

#### **16. REFERENCES**

1. G M Shaul, T J Holdsworth, C R Dempsey and K A Dostal, 1991, "Fate of Water Soluble Dyes in the Activated Sludge Process", *Chemosphere*, **22**, 107-119.
2. H Greim, J Ahlers, R Bias, B Broecker, H Hollander, H-P Gelbke, H-J Klimisch, I Mangelsdorf, A Paetz, N Schön, G Stropp, R Vogel, C Weber, K Ziegler-Skylakakis and E Bayer, 1994. "Toxicity and Ecotoxicity of Sulfonic Acids: Structure-Activity Relationship", *Chemosphere*, **28**, 2203-2236.
3. American Chemical Society, 1984. ACS Monograph 182, Chemical Carcinogens, Vol 1, 2nd ed (Charles E. Searle, Ed), University of Birmingham, England.
4. G Luty, 1978. *The acute intravenous toxicity of biological stains, dyes, and other fluorescent substances*. Toxicology and Applied Pharmacology 44 (2) 225-249.
5. T J Ward and R L Boeri, April 1992. "Static Acute Toxicity of EH & S 626 to the Fathead Minnow, *Pimephales promelas*", EnviroSystems Study No 91168-NA.
6. T J Ward and R L Boeri, April 1992. "Static Acute Toxicity of EH & S 626 to the Rainbow Trout, *Oncorhynchus mykiss*", EnviroSystems Study No 91169-NA.
7. T J Ward and R L Boeri, April 1992. "Static Acute Toxicity of EH & S 626 to the Daphnid, *Daphnia magna*", EnviroSystems Study No 91170-NA.
8. Standards Australia, 1991. Australian Standard 1715-1991, *Selection, use and maintenance of Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney.
9. Standards Australia, 1991, Australian Standard 1716-1991, *Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney.
10. Standards Australia, 1982. Australian Standard 1336-1982, *Eye Protection in the Industrial Environmental*, Standards Association of Australia Publ., Sydney.
11. Standards Australia, 1984. Australian Standard 1337-1984, *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney.

12. Standards Australia, 1978. Australian Standard 2161-1978, *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney.
13. Worksafe Australia, March 1994, *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)], Australian Government Publishing Service, Canberra.