Section 1 - Identification of Chemical Product and Company

Statement of Hazardous Nature
This product is classified as: Hazardous according to the criteria of NOHSC Australia.
Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.

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Substance:	Metolachlor is an amide derivative.
Trade Name:	Farmoz Clincher Herbicide
Product Use:	Agricultural herbicide for use as described on the product label.
Creation Date:	**March, 2003**
Revision Date:	**November, 2003**

Section 2 - Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m^3)	STEL (mg/m^3)
Metolachlor	51218-45-2	72	not set	not set
Other non hazardous ingredients	secret	to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that should not be exceeded for more than 15 minutes and should not be repeated for more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak "is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

Section 3 - Hazards Identification

Risk Phrases: R43. May cause sensitisation by skin contact.
Safety Phrases: S28. After contact with skin, wash immediately with plenty of soap and water.
SUSDP Classification: S5
ADG Classification: None allocated. Not a Dangerous Good.
UN Number: None allocated

Emergency Overview

Physical Description & colour: Clear amber liquid.
Odour: Mild solvent odour.
Major Health Hazards: Signs of human intoxication from Metolachlor exposure include abdominal cramps, anaemia, shortness of breath, dark urine, convulsions, diarrhoea, jaundice, weakness, nausea, sweating, and dizziness. Possible skin sensitiser.

Potential Health Effects

See section 11 for Chronic exposure studies.

Inhalation
Short term exposure: Available data indicates that this product is not harmful. In addition product is unlikely to cause any discomfort or irritation.

Skin Contact:
Short term exposure: Classified as a potential sensitiser by skin contact. Exposure to a skin sensitiser, once sensitisation has occurred, may manifest itself as skin rash or inflammation, and in some individuals this reaction can be severe. In addition product may be irritating, but is unlikely to cause anything more than mild transient discomfort.

Eye Contact:
Short term exposure: Available data shows that this product is not harmful. However product may be irritating to eyes, but is unlikely to cause anything more than mild transient discomfort.

Ingestion:

Short term exposure: This product is unlikely to cause any irritation problems in the short or long term.

Carcinogen Status:

NOHSC: No significant ingredient is classified as carcinogenic by NOHSC.
NTP: No significant ingredient is classified as carcinogenic by NTP.
IARC: No significant ingredient is classified as carcinogenic by IARC.

Section 4 - First Aid Measures

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

Inhalation: First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.
Skin Contact: If poisoning occurs, contact a Poisons Information Centre, or call a doctor at once. Irritation is unlikely. However, if irritation does occur, flush with lukewarm, gently flowing water for 5 minutes or until chemical is removed. If in doubt obtain medical advice.
Eye Contact: No effects expected. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed. Obtain medical advice if irritation becomes painful or lasts more than a few minutes.
Ingestion: First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: There is no risk of an explosion from this product under normal circumstances if it is involved in a fire. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids.
Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.
Extinguishing Media: Preferred extinguishing media are carbon dioxide, dry chemical, foam, water fog.
Fire Fighting: When fighting fires involving significant quantities of this product, wear a splash suit complete with self contained breathing apparatus.

Flash point:	Not flammable.
Upper Flammability Limit:	No data.
Lower Flammability Limit:	No data.
Autoignition temperature:	No data.
Flammability Class:	No data.

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Wear full protective clothing including face mask, face shield and gauntlets. All skin areas should be covered. See above under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber, PVC. Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. If spill is too large or if absorbent material is not available, try to create a dike to stop material spreading or going into drains or waterways. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this MSDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

Section 7 - Handling and Storage

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.
Storage: This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this class of poison. Make sure that containers of this product are kept tightly closed. Keep containers of this product in a well ventilated area. Make sure that the product does not come into contact with substances listed under

"Materials to avoid" in Section 10. Some liquid preparations settle or separate on standing and may require stirring before use. Check packaging - there may be further storage instructions on the label.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Industrial Clothing: **AS2919**, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

Exposure Limits **TWA (mg/m^3)** **STEL (mg/m^3)**

Exposure limits have not been established by NOHSC for any of the significant ingredients in this product.

The ADI for Metolachlor is set at 0.08mg/kg/day. The corresponding NOEL is set at 7.5mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, Dec 2002.

Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that vapours and mists are minimised.
Eye Protection: Eye protection such as protective glasses or goggles is recommended when this product is being used.
Skin Protection: If you believe you may have a sensitisation to this product or any of its declared ingredients, you should prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.
Protective Material Types: There is no specific recommendation for any particular protective material type.
Respirator: Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above.

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Clear amber liquid.
Odour:	Mild solvent odour.
Boiling Point:	Not available.
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	No specific data. Expected to be low at 100°C.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	1.05-1.06
Water Solubility:	Emulsifiable.
pH:	No data.
Volatility:	No data.
Odour Threshold:	No data.
Evaporation Rate:	No data.
Coeff Oil/water distribution:	2.9 (log P octanol/water)
Autoignition temp:	No data.

Section 10 - Stability and Reactivity

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.
Conditions to Avoid: This product should be kept in a cool place, preferably below 30°C. Containers should be kept dry.
Incompatibilities: strong acids, strong bases, strong oxidising agents.
Fire Decomposition: Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas. Hydrogen chloride gas, other compounds of chlorine. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death. Hydrogen cyanide poisoning signs and symptoms are weakness, dizziness, headache, nausea, vomiting, coma, convulsions, and death. Death results from respiratory arrest. Hydrogen cyanide gas acts very rapidly; symptoms and death can both occur quickly.
Polymerisation: This product is unlikely to undergo polymerisation processes.

Section 11 - Toxicological Information

Toxicity: **Acute toxicity:** Metolachlor is harmful via ingestion. The reported oral LD_{50} in rats for technical grade Metolachlor is from 1200mg/kg to 2780mg/kg. It is practically nontoxic by skin exposure, with a reported dermal LD_{50}

of greater than 2000mg/kg. Technical Metolachlor is a skin sensitizer in guinea pigs, and causes slight irritation and mild eye irritation in rabbits. The formulated products are generally not skin sensitizers, but cause a range (slight to moderate) of skin and eye irritation in rabbits. The 4-hour rat inhalation LC_{50} of greater than 4.3mg/L indicates slight toxicity via this route. Compared to the technical grade, Metolachlor formulations are generally of similar or lesser toxicity by all routes, except by inhalation; some formulated products may show higher toxicity by this route. However, none of the formulated products for which inhalation toxicity data are available are highly toxic by this route. Human exposure most commonly occurs through skin or eye contact. Signs of human intoxication from Metolachlor exposure include abdominal cramps, anemia, shortness of breath, dark urine, convulsions, diarrhea, jaundice, weakness, nausea, sweating, and dizziness.

Chronic toxicity: While Metolachlor is not readily absorbed by the skin, repeated dermal exposures may create skin sensitization, especially among those who work with Metolachlor. In rats fed Metolachlor for 90 days, no effects were noted at about 90mg/kg/day. In a 2-year study of mice, a similar no-effect level was found, but doses of about 300mg/kg/day caused decreased body weight gain. No negative effects on mortality or organ weights were observed in male or female rats at doses of 15mg/kg/day, but exposed females showed significantly lower weight gain and microscopic changes in their liver structure at 150mg/kg/day.

Reproductive effects: In two long-term rat reproduction studies, mating, gestation, lactation, and fertility were not affected at doses of 50mg/kg/day. However, pup weights and parental food consumption decreased at this low dose. In another 2-year rat study, Metolachlor caused the wasting of testicles at doses of 150mg/kg/day. In studies on mice, no effects were noted on fertility, or zygote or embryo survival rates after very high single oral doses. This evidence suggests that Metolachlor is not likely to have an effect on reproduction in humans under normal circumstances.

Teratogenic effects: Metolachlor caused no birth defects in rats at maternal doses of 300mg/kg/day administered during critical periods of gestation (organogenesis), although some delayed or abnormal development in offspring was seen at this dose. A decrease in food consumption was observed in the mother. In rabbits, a similar pattern of effects (no defects but some delayed development) was also seen at doses of up to 360mg/kg/day. These data indicate that teratogenic and developmental effects in humans are unlikely at expected levels of exposure.

Mutagenic effects: Metolachlor tested negative in two bacterial assays. Also, no mutagenicity effects were noted in a standard mouse test. From this evidence it is unlikely that the compound is mutagenic.

Carcinogenic effects: Male and female mice exposed to doses up to 100mg/kg/day for 18 to 20 months did not develop cancer, nor did male rats at doses of up to 150mg/kg/day over a 2-year period. Female rats given high doses for 2 years showed a significant increase in new growths, nodules, and lesions in livers at that dose. From these data, it seems unlikely that Metolachlor is carcinogenic in humans.

Organ toxicity: Exposure to Metolachlor can damage the liver and cause irritation of the skin, eyes, and mucous membranes. It has also caused skin sensitization in guinea pigs.

Fate in humans and animals: Studies show that orally administered Metolachlor is quickly broken down into metabolites and is almost totally eliminated in the urine and faeces of goats, rats, and poultry. Metolachlor itself was not detected in the urine, faeces, or body tissues. Rats, given a single oral dose of Metolachlor, excreted 70 to 90% of the Metolachlor as metabolites within 48 hours. In animals, trace amounts of Metolachlor metabolites were found in kidneys, liver, blood, and milk; however, no residues were found in eggs, meat, or fat samples of laying chickens.

Section 12 - Ecological Information

Breakdown in soil and groundwater: Metolachlor is moderately persistent in the soil environment. Half-lives of 15 to 70 days in different soils have been observed. Soils with significant soil water content may show more rapid breakdown. Very little Metolachlor volatilizes from the soil, and photodegradation will be a significant pathway for loss only in the top few inches. Breakdown is mainly dependent upon microbial activity, and thus will be temperature-dependent. Microorganism metabolism occurs by both aerobic and anaerobic processes, and is affected by temperature, moisture, amount of leaching, soil type, nitrification, oxygen concentrations, and sunlight. Metolachlor is moderately well sorbed by most soils. Soils with higher organic matter and clay content may sorb it better. It is slightly soluble in water. Extensive leaching is reported to occur, especially in soils with low organic content. Metolachlor was one of four pesticides that were extensively studied throughout the USA in the National Alachlor Well Water Survey. This several-year project analyzed the contents of over 6 million private and domestic wells. Metolachlor was detected in about 1% of the wells (about 60,000 wells) at concentrations ranging from 0.1 to 1.0 µg/L. It has also been found in a number of surface water samples in 14 states, at a maximum concentration of 0.138mg/L. These levels may result from runoff during spring and summer applications to fields.

Breakdown in water: Metolachlor is highly persistent in water over a wide range of water acidity. Its half-life at 20 C is more than 200 days in highly acid waters, and is 97 days in highly basic waters. Metolachlor is also relatively stable in water under natural sunlight. About 6.6 % was degraded by sunlight in 30 days, a slow and minimal rate.

Breakdown in vegetation: Metolachlor, applied before plants emerge, is absorbed through shoots just above the seed, and may be absorbed from the soil into and through the roots. This chemical acts by inhibiting the production of essential plant components like chlorophylls, enzymes, and other proteins. Metolachlor is a growth inhibitor affecting root and shoot growth after seeds have germinated. The breakdown of Metolachlor in corn, soybean, peanuts, and sorghum is similar. Residues and metabolites are found in minimal concentrations in roots, grain, and oil, but other parts of the plants may have higher levels. Some care should be exercised when crop remnants are used as forage; cotton crops may retain very high levels of residue.

Section 13 - Disposal Considerations

Disposal: Instructions concerning the disposal of this product and its containers are given on the product label. These should be carefully followed.

Section 14 - Transport Information

ADG Code: This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

Section 15 - Regulatory Information

AICS: All of the significant ingredients in this formulation are to be found in the public AICS Database.

Section 16 - Other Information

Much of the Information in this MSDS came from Extoxnet, a Pesticide Information Project of Cooperative Extension Offices of Cornell University, Oregon State University, the University of Idaho, and the University of California at Davis and the Institute for Environmental Toxicology, Michigan State University.

This MSDS contains only safety-related information. For other data see product literature.

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
AICS	Australian Inventory of Chemical Substances
CAS number	Chemical Abstracts Service Registry Number
Hazchem Number	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
NOHSC	National Occupational Health and Safety Commission
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSDP	Standard for the Uniform Scheduling of Drugs & Poisons
UN Number	United Nations Number

Contact Points:

Call Farmoz on (02)9431 7800 **Fax: (02)9431 7700 and ask for the technical manager.**

Police and Fire Brigade:	**Dial 000**
Emergency contact:	**1800 024 973 (24 hours)**

If ineffective: **Dial Poisons Information Centre (13 1126 from anywhere in Australia)**

Please read all labels carefully before using product.

http://www.kilford.com.au/ Phone (02)9251 4532