Apparent Clopyralid 300 Herbicide

AIRR Apparent Pty Ltd.

Chemwatch Hazard Alert Code: 3

Chemwatch: **9656-24**
Version No: **2.1**
Safety Data Sheet according to Work Health and Safety Regulations (Hazardous Chemicals) 2023 and ADG requirements

Initial Date: **23/10/2026**
Revision Date: **23/10/2026**
Print Date: **23/11/2026**
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SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	Apparent Clopyralid 300 Herbicide
Chemical Name	Not Applicable
Synonyms	Not Available
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains clopyralid)
Chemical formula	Not Applicable
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	A liquid broadleaf agricultural herbicide. Use according to manufacturer's directions.

Details of the manufacturer or importer of the safety data sheet

Registered company name	**AIRR Apparent Pty Ltd.**
Address	15/16 Princes Street, Newport NSW 2106 Australia
Telephone	+61 3 5820 8400
Fax	Not Available
Website	www.apparent.com.au
Email	enquiries@apparentag.com.au

Emergency telephone number

Association / Organisation	**AIRR Apparent Pty Ltd.**
Emergency telephone number(s)	1800 033 111 (24 Hours)
Other emergency telephone number(s)	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	S5
Classification [1]	Sensitisation (Skin) Category 1, Serious Eye Damage/Eye Irritation Category 1, Hazardous to the Aquatic Environment Long-Term Hazard Category 2
Legend:	***1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI***

Label elements

Hazard pictogram(s)	
Signal word	**Danger**

Hazard statement(s)

H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H411	Toxic to aquatic life with long lasting effects.

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Precautionary statement(s) Prevention

P280	Wear protective gloves, protective clothing, eye protection and face protection.
P261	Avoid breathing mist/vapours/spray.
P273	Avoid release to the environment.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician/first aider.
P302+P352	IF ON SKIN: Wash with plenty of water.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.
P391	Collect spillage.

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

No further product hazard information.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
1702-17-6	30	clopyralid
Not Available	balance	Ingredients determined not to be hazardous
Legend:	***1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available***	

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Immediately hold eyelids apart and flush the eye continuously with running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▸ Transport to hospital or doctor without delay. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: ▸ Immediately remove all contaminated clothing, including footwear. ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▸ Other measures are usually unnecessary.
Ingestion	▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Firefighting measures

Extinguishing media

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

Special hazards arising from the substance or mixture

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Fire Incompatibility	‣ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Fire Fighting	‣ Alert Fire Brigade and tell them location and nature of hazard. ‣ Wear full body protective clothing with breathing apparatus. ‣ Prevent, by any means available, spillage from entering drains or water course. ‣ Use water delivered as a fine spray to control fire and cool adjacent area. ‣ Avoid spraying water onto liquid pools. ‣ **DO NOT** approach containers suspected to be hot. ‣ Cool fire exposed containers with water spray from a protected location. ‣ If safe to do so, remove containers from path of fire.
Fire/Explosion Hazard	‣ Combustible. ‣ Slight fire hazard when exposed to heat or flame. ‣ Heating may cause expansion or decomposition leading to violent rupture of containers. ‣ On combustion, may emit toxic fumes of carbon monoxide (CO). ‣ May emit acrid smoke. ‣ Mists containing combustible materials may be explosive. Combustion products include: ‣ carbon dioxide (CO_2) hydrogen chloride phosgene nitrogen oxides (NOx) ‣ other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.
HAZCHEM	•3Z

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	‣ Remove all ignition sources. ‣ Clean up all spills immediately. ‣ Avoid breathing vapours and contact with skin and eyes. ‣ Control personal contact with the substance, by using protective equipment. ‣ Contain and absorb spill with sand, earth, inert material or vermiculite. ‣ Wipe up. ‣ Place in a suitable, labelled container for waste disposal.
Major Spills	Moderate hazard. ‣ Clear area of personnel and move upwind. ‣ Alert Fire Brigade and tell them location and nature of hazard. ‣ Wear breathing apparatus plus protective gloves. ‣ Prevent, by any means available, spillage from entering drains or water course. ‣ No smoking, naked lights or ignition sources. ‣ Increase ventilation. ‣ Stop leak if safe to do so. ‣ Contain spill with sand, earth or vermiculite. ‣ Collect recoverable product into labelled containers for recycling. ‣ Absorb remaining product with sand, earth or vermiculite. ‣ Collect solid residues and seal in labelled drums for disposal. ‣ Wash area and prevent runoff into drains. ‣ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	‣ Avoid skin contact, including inhalation. ‣ Wear protective clothing when risk of exposure occurs. ‣ Use in a well-ventilated area. ‣ Prevent concentration in hollows and sumps. ‣ **DO NOT** enter confined spaces until atmosphere has been checked. ‣ Avoid smoking, naked lights or ignition sources. ‣ Avoid contact with incompatible materials. ‣ When handling, **DO NOT** eat, drink or smoke. ‣ Keep containers securely sealed when not in use. ‣ Avoid physical damage to containers. ‣ Always wash hands with soap and water after handling. ‣ Work clothes should be laundered separately. ‣ Use good occupational work practice. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS. ‣ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions. ‣ **DO NOT** allow clothing wet with material to stay in contact with skin
Other information	‣ Store in original containers. ‣ Keep containers securely sealed. ‣ No smoking, naked lights or ignition sources.

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	‣ Store in a cool, dry, well-ventilated area. ‣ Store away from incompatible materials and foodstuff containers. ‣ Protect containers against physical damage and check regularly for leaks. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	‣ Metal can or drum ‣ Packaging as recommended by manufacturer. ‣ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	for pyridines: · Because of the electronegative nitrogen in the pyridine ring, the molecule is relatively electron deficient. It, therefore, enters less readily electrophilic aromatic substitution reactions, which are characteristic of benzene derivatives; even more so if the reaction mix doesn't scavenge protons released by the reaction (protonated pyridine is even more electron-deficient). However, unlike benzene and its derivatives, pyridine is more prone to nucleophilic substitution and metalation of the ring by strong organometallic bases. · The nitrogen center of pyridine features a basic lone pair of electrons. Because this lone pair is not part of the aromatic ring, pyridine is a base, having chemical properties similar to those of tertiary amines. Pyridine can act as Lewis base, donating its pair of electrons to a Lewis acid. · Pyridine is protonated by reaction with acids and forms a positively charged aromatic polyatomic ion called pyridinium The reactivity of pyridine can be distinguished for three chemical groups. · With electrophiles, electrophilic substitution takes place where pyridine expresses aromatic properties. · With nucleophiles, pyridine reacts at positions 2 and 4 and thus behaves similar to imines and carbonyls. · The reaction with many Lewis acids results in the addition to the nitrogen atom of pyridine, which is similar to the reactivity of tertiary amines. The ability of pyridine and its derivatives to oxidize, forming amine oxides (N-oxides), is also a feature of tertiary amines Secondary amines form salts with strong acids and can be oxidized to the corresponding nitrone using hydrogen peroxide, catalyzed by selenium dioxide ‣ Avoid reaction with oxidising agents

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Not Available

MATERIAL DATA

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.
OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents

Continued...

2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Individual protection measures, such as personal protective equipment



Eye and face protection

- Safety glasses with side shields.
- Chemical goggles.[AS/NZS 1337.1, EN166 or national equivalent]
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

Skin protection

See Hand protection below

Hands/feet protection

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber

NOTE:

- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
· Contaminated gloves should be replaced.
As defined in ASTM F-739-96 in any application, gloves are rated as:
· Excellent when breakthrough time > 480 min
· Good when breakthrough time > 20 min
· Fair when breakthrough time < 20 min
· Poor when glove material degrades
For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.
It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task.
Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:
· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.
· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Body protection

See Other protection below

Other protection

- Overalls.
- P.V.C apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

Respiratory protection

Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas/vapour concentration present in air p.p.m. (by volume)	Half-face Respirator	Full-Face Respirator
up to 10	1000	A-AUS / Class1	-

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up to 50	1000	-	A-AUS / Class 1
up to 50	5000	Airline *	-
up to 100	5000	-	A-2
up to 100	10000	-	A-3
100+			Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear to dark greenish coloured liquid.

Physical state	Liquid	**Relative density (Water = 1)**	1.16
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	6-8	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	0	**Viscosity (mm2/s)**	Not Available
Initial boiling point and boiling range (°C)	100-105	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Miscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available
Heat of Combustion (kJ/g)	Not Available	**Ignition Distance (cm)**	Not Available
Flame Height (cm)	Not Available	**Flame Duration (s)**	Not Available
Enclosed Space Ignition Time Equivalent (s/m3)	Not Available	**Enclosed Space Ignition Deflagration Density (g/m3)**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	- Unstable in the presence of incompatible materials. - Product is considered stable. - Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

a) Acute Toxicity	Based on available data, the classification criteria are not met.
b) Skin Irritation/Corrosion	Based on available data, the classification criteria are not met.
c) Serious Eye Damage/Irritation	There is sufficient evidence to classify this material as eye damaging or irritating
d) Respiratory or Skin sensitisation	There is sufficient evidence to classify this material as sensitising to skin or the respiratory system
e) Mutagenicity	Based on available data, the classification criteria are not met.

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f) Carcinogenicity	Based on available data, the classification criteria are not met.
g) Reproductivity	Based on available data, the classification criteria are not met.
h) STOT - Single Exposure	Based on available data, the classification criteria are not met.
i) STOT - Repeated Exposure	Based on available data, the classification criteria are not met.
j) Aspiration Hazard	Based on available data, the classification criteria are not met.

Inhaled	The material is not expected to produce adverse health effects or respiratory irritation following inhalation and is not classified for respiratory irritation under Regulation (EC) No 1272/2008 (CLP), as amended. Nevertheless, adverse systemic effects have been identified following exposure of animals by at least one other route. Good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be implemented in an occupational setting.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual.
Skin Contact	Skin contact is not expected to result in harmful health effects and the material is not classified as hazardous by the dermal route under Regulation (EC) No 1272/2008 (CLP), as amended. However, the material may cause harm following entry through wounds, lesions or abrasions. Brief skin contact with clopyralid is unlikely to result in irritation. Prolonged or repeated contact may cause irritation and the material may rarely cause an allergic skin response. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. Pyridine, its derivatives and homologues, may produce local irritation on contact with the skin. Absorption may produce systemic effects similar to those produced following inhalation. The material may produce mild skin irritation; limited evidence or practical experience suggests, that the material either: ‣ produces mild inflammation of the skin in a substantial number of individuals following direct contact, and/or ‣ produces significant, but mild, inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (non allergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.
Eye	When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.
Chronic	Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals. Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance who are likely to become hyper-responsive. Substances than can cuase occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing air-way hyper-responsiveness. The latter substances are not classified as asthmagens or respiratory sensitisers Wherever it is reasonably practicable, exposure to substances that can cuase occupational asthma should be prevented. Where this is not possible the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance. On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Repeated ingestion of large doses of clopyralid produces liver and kidney damage in rats. Feeding studies with rats showed 150 mg/kg/day produced decreased mean body weights in females. Hyperplasia and thickening of the limiting ridge of the stomach also occurred. Reproductive effects have also been reported in some animal studies Clinical symptoms and signs of intoxication following occupational exposure to pyridine, its homologues and derivatives include gastrointestinal disturbance with diarrhoea, abdominal pain and nausea, weakness, headache, insomnia and nervousness..Data indicate that piperidine, pyridine, methyl and alkyl derivatives of pyridine (picolines, lutidines collidines), nicotinonitrile and picolinonitrile are slightly to moderately toxic following acute exposures The available data support the conclusion that the pyridines possess similar human health-related data, and in particular, target organs appear to be the liver and the male reproductive tract., The weight-of-evidence suggests that Pyridine and Pyridine Derivatives Category chemicals are not mutagenic. This conclusion is supported by a number of in vivo mutagenicity assays and carcinogenicity studies with negative results for pyridine. Reproductive screening evaluations using several repeated dose toxicity studies indicates that piperidine, pyridine and nicotinonitrile may be male reproductive toxicants. Exposures less than those which produce overt clinical signs may produce varying levels of liver damage with central lobular fatty degeneration, congestion and cellular infiltration; repeated low level exposures may produce cirrhosis. The kidney is less sensitive to pyridine-induced damage than is the liver. Pyridine, like primidone, phenobarbitol and oxazepam induces liver neoplasms in mice, but not in rats, even though in rats these chemicals cause a spectrum of toxic liver lesions. The mouse, an animal with a high background rate of liver neoplasms, is particularly sensitive to the development of malignant liver neoplasms following chemical exposure. There is equivocal evidence (1) that pyridine is carcinogenic in male F344/N rats (based on an increased incidence of renal tubule neoplasms), in female rats of the same species (based on increases in mononuclear cell leukaemia), in male Wistar rats (based on an increased incidence of mono-nuclear cell leukaemia), and clear evidence of carcinogenicity (1) in male and female B6C3F1 mice (based on increased incidences of malignant hepatocellular neoplasms). 1: National Toxicology Program Technical Report Series No. 470, March 2000

Apparent Clopyralid 300 Herbicide	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
clopyralid	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[2]	Not Available
	Inhalation (Rat) LC50: >0.2 mg/l4h[2]	
	Oral (Rat) LD50: 4300 mg/kg[2]	

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Legend:	***1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances***

CLOPYRALID	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
Apparent Clopyralid 300 Herbicide & CLOPYRALID	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested. for clopyralid: ADI 0.15 mg/kg * Toxicity Class WHO Table 5; EPA IV * NOEL (2 y) for rats 15, male mice 500, female mice >2000 mg/kg daily * Non-mutagenic, non-teratogenic, and produces no significant toxicological effects on reproductive parameters * **Acute toxicity:** Clopyralid is of low acute toxicity to mammals, is not extensively metabolised and is rapidly excreted in the urine. The dermal absorption of clopyralid is poor. It is a skin irritant, but not a sensitiser, and can cause irreversible ocular damage. In high doses, it can impair liver and kidney function, and cause lethargy, ataxia, tremors, convulsions, and mortality. Severe ocular damage has been found after instillation of clopyralid into the eyes of rabbits and after aerosol inhalation in rats. In three unpublished studies, the ocular damage was still present three weeks after treatment. Salts of clopyralid are not expected to produce eye damage. No systemic effects were found in rabbits after application of 2,000 mg/kg to shaved skin for 24 hours. Erythema and edema found in rabbits with a single application of 5,000 mg/kg to shaved skin for 24 hours was reversible by day ten. In rabbits, erythema and edema were observed after application of 2,000 mg/kg to shaved skin for 24 hours followed by covering with plastic to prevent ingestion. These effects were reversible after three days in all but one animal. In four studies in guinea pigs that included a total of 85 animals, only one had changes suggestive of contact hypersensitivity (allergy, sensitisation), and two had erythema. Labored breathing and color changes in the lungs at necropsy were found in an inhalation study in rats, a result that the authors concluded was unlikely to be a toxic effect of clopyralid. However abnormal atypical foci or nodules in the lungs were found in beagle dogs at the highest dose tested. At high doses, clopyralid can cause lethargy, ataxia, tremors, convulsions, and mortality **Repeat dose toxicity:** The sub-chronic toxicity of clopyralid is also low, and no effects have been found in mammals at low doses (.50 mg/kg-day). At dose >= 100 mg/kg-day, changes have been found in the kidney, liver, and gastrointestinal tract. No carcinogenic effects of clopyralid have been found in the rat, mouse, or dog . No major malformations (teratogenesis) have been found in clopyralid studies in rats, mice and rabbits, and no reproductive or developmental effects at doses that did not also cause maternal toxicity. **Reproductive and Developmental Toxicity:** No major malformations (teratogenesis) have been found related to clopyralid exposure in reproductive and developmental studies in rats, mice and rabbits. No reproductive or developmental effects were found at doses that did not also cause maternal toxicity. In a two-generation rat study, no major malformations or effects on fertility and reproduction were found, but increased liver weights in first and second generation pups were found at the highest dose tested. A second study showed similar findings and also found decreased body weights in parents and pups. In another rat study with moderate maternal toxicity, nonstatistically significant minor foetal skeletal and soft tissue abnormalities were observed. In mice, no adverse effects on reproduction or development were found at any dose. In the rabbit, maternal toxicity was found at the 250 mg/kg dose, at which a decrease in foetal body weight was also observed, while another study at this dose level found no maternal toxicity or effects on the foetus. Other studies at lower doses found no adverse effects No carcinogenic effects of clopyralid have been found in the rat, mouse, or dog. Long-term studies have found decreased body weight and increased relative liver and kidney weights, and changes in the gastric lining at the highest dose tested in rats. The only change found in mice was decreased body weight at the highest dose tested. In the dog, haematological changes, and increases in liver weight were found. **Genotoxicity:** ***In vitro*** and ***in vivo*** tests in bacteria showed no evidence for induced mutations, no significant increase in chromosome aberrations in bone marrow, and no evidence of unscheduled DNA synthesis. US EPA has classified clopyralid as Not Likely To Be Carcinogenic to Humans, and has set a chronic and intermediate-term RfD of 0.15 mg/kg-day using a NOAEL of 15 mg/kg and a LOAEL of 150 mg/kg from a two year study in rats based on increased epithelial hyperplasia and thickening of the limiting ridge of the stomach in males and females **Metabolic fate:** Clopyralid is highly water soluble (1,000 mg/L), and the data from feeding studies show that it is not extensively metabolized; it is excreted rapidly in the urine. Rats administered 5 mg/kg of 14C-labeled clopyralid intravenously and 50 mg/kg orally excreted a large percentage of the dose (79 to 96 percent) unchanged in the urine within 24 hours with a half-time of three hours. The radioactive residue in the feces was also primarily clopyralid. There were no apparent differences in tissue distribution, elimination patterns, carcass residues, or rate and routes of excretion between the intravenous and orally administered doses in males or females. The excretion of largely unmetabolised clopyralid was also found in studies using hens and goats

Acute Toxicity	✗	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✗	**Reproductivity**	✗
Serious Eye Damage/Irritation	✓	**STOT - Single Exposure**	✗
Respiratory or Skin sensitisation	✓	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ ***– Data either not available or does not fill the criteria for classification***
✓ ***– Data available to make classification***

SECTION 12 Ecological information

Toxicity

Apparent Clopyralid 300 Herbicide	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available
clopyralid	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**

Continued...

NOEC(ECx)	192h	Crustacea	0.03mg/L	4
EC50	96h	Algae or other aquatic plants	4.425-5.85mg/L	4
LC50	96h	Fish	630-780mg/l	4

Legend: ***Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. US EPA, Ecotox database - Aquatic Toxicity Data 4. ECETOC Aquatic Hazard Assessment Data 5. NITE (Japan) - Bioconcentration Data 6. METI (Japan) - Bioconcentration Data 7. Vendor Data 8. User defined data***

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
For clopyralid and its salts:
Kow 1.56 x 10(exp-2) (pH 5), 2.33 x 10(exp-3) (pH 7), 2.8 x 10(exp-3) (pH 9)
DT50 in laboratory studies range from 14-56 days. Field dissipation and lysimeter studies shows the potential to contaminate ground water through leaching is minimal.
Koc range from 0.4 in clay loam to 12.9 in sand with Kd ranging from 0.0094 to 0.0935 (mean values for four soils Koc 4.64 and Kd 0.0412)
Environmental fate:
Clopyralid is a weak organic acid, with pKa of 2.0. In a dilute solution of clopyralid, the acid is almost completely dissociated to form the clopyralid anion and acid (H3O+). The pH of a 10 mg/L solution of clopyralid is 4.28 and that of a 1.0 mg/L solution is 5.28. When dissolved in water, the MEA salt produces a slightly basic solution due to the buffering activity of the salt.
Water Solubility and Soil Binding:
Clopyralid acid is a solid at room temperature and has high water solubility (143,000 mg/L at pH 7 and 25 C). The MEA salt of triclopyr is more soluble than the acid (>300,000 mg/L at 25 C). The octanol-water partition coefficient, log Kow, for clopyralid is 2.34 x 10-2 indicating high solubility in water relative to organic solvents and little potential for bioaccumulation.
The average organic-carbon-adjusted soil adsorption coefficient (Koc) of clopyralid is 5 ml/g, a value that indicates that, in a mix of soil and water, most clopyralid remains dissolved in water rather than bound to organic matter in soil. This property makes clopyralid mobile in soils. The range of Koc values for clopyralid is 0.4-29.8 ml/g, and increased soil sorption is observed over time
In soil and water, clopyralid is degraded primarily by microbial metabolism. It is resistant to degradation by sunlight, hydrolysis, or other chemical degradation. It is water-soluble, does not bind strongly with soils, and has the potential to be highly mobile in soils, especially sandy soils. Clopyralid is not highly volatile.
In soil microbial degradation occurs; slow degradation occurs in sterile soil. Carbon dioxide is the major metabolite; only traces of other metabolites have been reported.
Soil: Clopyralid is moderately persistent in soils. Because it is degraded entirely by soil microbes, soil conditions that maximize microbial activity (warm and moist) will facilitate clopyralid degradation. The average half-life of clopyralid in soils is one to two months but can range from one week to one year depending on the soil type, temperature, and rates of application.
Water: Clopyralid is highly water-soluble and will not bind with suspended particles in the water column. Degradation is almost entirely through microbial metabolism in aquatic sediments, but because clopyralid does not bind with sediments readily, it can be persistent in an aquatic environment. The half-life of clopyralid in water ranges from 8 to 40 days. When clopyralid enters the soil through direct spray, runoff from plant foliage, or translocation from the roots of treated plants, it rapidly disassociates to the anion form. The negatively charged anion form is highly water-soluble and has a very low capacity to adsorb to soil particles. Consequently, clopyralid has the potential to be highly mobile in the environment. Clopyralid s chemical characteristics suggest it has a high potential for movement, but most field studies found that it is not as mobile expected. Where clopyralid leaches to lower soil depths, it persists longer than it does at the surface because the microbial populations generally decrease with soil depth.
Persistence: Clopyralid can be quite persistent in the environment. It is stable to both hydrolysis and photolysis in aqueous systems In soils, microbial activity is the primary degradation process, with an aerobic half-life of 152 days Carbon dioxide is the only metabolite that has been identified. Soil half-life ranges from 8-250 days and is shorter in warm, moist soils and at lower application rates. Clopyralid is stable under anaerobic conditions, with no significant degradation occurring in either water or soil. Field dissipation half-lives are shorter, with an average aqueous half-life of 9-22 days in freshwater lakes and 8-66 days in soils. In the summer when soils are dry, degradation of clopyralid is likely to be slow.
Clopyralid residues remain in treated plants over the growing season and in residues from treated plants such as compost. Clopyralid s persistence in composted grass clippings resulted in restrictions on its use in both California and Washington, with bans placed on the use of clopyralid products on lawns and turf in these states to prevent contamination of compost. In Washington, the purchase of clopyralid products for use on wheat, other cereal grains, and grass grown for hay is now limited to licensed pesticide applicators. Dow (a vendor) noted that composting conditions were important for complete degradation of clopyralid in compost, but also commented that clopyralid residues in one crop could have negative effects on a sensitive crop planted after the treated crop.
Clopyralid can be transported away from an application site or degrade in soil, water and air through a number of different chemical or biological processes. The most important processes for dissipation of clopyralid are microbial biodegradation, runoff into surface waters, and uptake by plants.
Microbial Degradation: Microbial transformation of clopyralid is the primary means of degradation in the environment. The only significant transformation product appears to be CO2. A single hydrolysis product accounted for < 3% of the applied clopyralid in an aerobic soil metabolism study, but the compound was not identified. Microbial activity increases with higher temperatures and moisture levels and decreases under cold, dry or anaerobic conditions.
Transport by Air: Air transport of clopyralid away from the application site can occur through spray drift during
and for a short time after an application. Spray drift can contaminate soil and surface waters, damage non-target plants, and expose humans and wildlife through inhalation and dermal exposure. Post-application volatilization drift is not a significant source of off-site transport for clopyralid MEA because of its low vapor pressure (2.0 x 10-7 mm Hg at 25 C). When dissolved in water, clopyralid does not appreciably escape to the air, as indicated by its very low Henry's law constant of 3.55 x 10-8 atm-m3/mol.
Transport by Water: Clopyralid is considered to be mobile in soils because of its low Koc value and high water solubility. In lysimeter studies of soil leaching, clopyralid was observed to move to a depth of 6-18 inches, with 0.1-0.6% of the applied herbicide lost through leaching. there are conditions where substantial leaching of clopyralid to groundwater occurs in the presence of fractured soils that provide preferential pathways for transport Herbicide concentrations were measured in water samples from suction lysimeters and tile drain effluent during and after a leaching irrigation. Clopyralid was found throughout the soil profile within 20 days of application and was detected in the first water flowing in the tile drains. Approximately 1.5% of the applied clopyralid was lost in the tile drain effluent. Higher concentrations of clopyralid were found in the tile drain samples at 2 m depth than in lysimeter samples taken from 1.5 and 1.8 m. This observation was attributed to movement of the water through preferential flow paths that allowed leachate to flow directly to drain water and not through the soil matrix.
As with most herbicides, runoff of clopyralid is most likely to occur as a result of heavy rainfall immediately after application.
Ecotoxicity:
Birds: Acute oral LD50 for mallard ducks 1465, bobwhite quail >2000 mg/kg
Five-day dietary LC50: for mallard ducks and bobwhite quail >4640 mg/kg diet
Fish LC50 (96 h): trout 104 mg/l; bluegill 125 mg/l
Clopyralid MEA is substantially less toxic than the acid, with LC50 values ranging from 1,500- 3,500 mg/l (or 2,000-4,700 mg /l).14, 102 Since clopyralid has a pKa of about 2 it is likely that the apparently higher toxicity of clopyralid acid is due to the fact that it significantly lowers solution pH.
Daphnia EC50 (48 h): 225 mg/l; EC50 (21 d) immobilisation 69, reproduction 80 mg/l; NOEC 17 mg/l
Unlike fish, invertebrates are not more sensitive to clopyralid acid compared to the MEA salt. The MEA salt is only marginally less toxic to ***Daphnia magna***, with an LC50 value of 350 mg /l
Aquatic plants EC50 duckweed 89 mg/l
Algae EC50 (96 h): Selenastrum capricornutum 6.9 mg/l (cell count), 7.3 mg/l (cell volume)
Other aquatic spp EC50 (14 d): Lenna gibba 89 mg/l
Aquatic plants are more sensitive to clopyralid than fish or aquatic invertebrates.
Bees; Non-toxic. LD50 (48 h, oral and contact) >100 ug/bee
Other beneficial spp. LC50 (14 d) for earthworms >1000 mg/kg soil.
No effects on nitrification, nitrogen fixation or degradation of cellulose, starch, protein and leaf material at 1-10 ppm.
Acute and chronic clopyralid toxicity to mammals is low, with no effects observed in laboratory studies at doses less than 50 mg/kg. Clopyralid is not acutely to slightly toxic to birds, not acutely to slightly toxic to insects, and not toxic to soil microbes like mycorrhizal fungi. There is some evidence of sub-lethal central nervous system effects in birds. Clopyralid is classified as not acutely toxic to fish and aquatic invertebrates and not acutely to slightly toxic to aquatic plants. Toxicity varies by chemical, with the MEA salt of clopyralid less toxic than clopyralid acid.
Clopyralid residues are highly toxic to non-target broadleaf plants. Clopyralid is also relatively long-lived in soil and leaf litter, indicating that rainfall or irrigation water runoff may have adverse effects on non-target plants. Clopyralid works by mimicking a plant s auxins, or growth hormones, causing a proliferation of abnormal growth that interferes with nutrient transport. At sufficient doses this results in gross signs of damage and the death of the affected plant. At the biochemical level, clopyralid has been shown to inhibit

Continued...

glutamine synthetase and NADPH reductase in pea and oat chloroplasts and disrupt normal carbohydrate balance in honey mesquite. Although clopyralid can be absorbed from both leaves and roots, foliar absorption predominates, with 97% absorption within 24 hours of application. Clopyralid is preferentially toxic to broad-leaf weeds and relatively non-toxic to grasses.
At sufficiently high-soil concentrations, clopyralid can cause significant damage by root absorption. Root uptake is greater at low pH, suggesting that the acid form of clopyralid is more readily absorbed than the anionic form.
Clopyralid is far more toxic to dicots than monocots or conifers.
Plant Metabolism – Clopyralid passes rapidly into leaves and roots of plants and is rain-fast within two hours. Once inside the plant, clopyralid is converted to the anion form and transported throughout the plant. It is not readily degraded by the plant and can be persistent, even in non-susceptible species.
Animal Metabolism – The manufacturer reports that studies found that the majority of clopyralid ingested by mammals was excreted unmetabolised in their urine within 24 hours. Some clopyralid, however, was retained in their livers and kidneys
A persistent herbicide (or contains the herbicide)
Certain herbicides can persist on vegetation and in the soil for months or years and these products are called "persistent herbicides". Persistent herbicides are a narrow range of herbicides used to kill broad leaf weeds and thistle that compete with grasses and grain crops. They are "persistent" because they will not be killed by the high temperatures in thermophilic composting and may take over 2 years or more to fully decay
The class of herbicides from the picolinic acid family is of the greatest concern. These chemicals are marketed for use in hayfields, horse pastures, golf courses, roadways, grain crops, and lawns, to kill unwanted broad-leaf weeds. These herbicides do not normally impact grasses and plants like corn, wheat, and oats.
Herbicides vary in their potential to persist in soil. Herbicide families that have persistent members include triazines, uracils, phenylureas, sulfonylureas, dinitroanilines, isoxazolidiones, imidazolinones, and certain plant growth regulators belonging to the pyridine family.
The length of time a herbicide remains active in soil is called "soil persistence," or "soil residual life". For some herbicides, there may be a fine line between controlling weeds for the entire growing season and then planting a sensitive rotation crop. Anything that affects the disappearance or breakdown of herbicides affects persistence.
Persistent herbicides are generally colourless and odorless. Scientific studies reveal that pass unaltered during animal digestion (including microbial digestion) when used at labelled rates. In fact, animal digestion tends to strengthen the impact of these chemicals through concentration because the animal processes the food but passes most of the chemical as a waste.
Persistent herbicide may will kill a tomato plant at a concentration of one part per billion, and impact many other garden plants as well. Plant families sensitive to persistent herbicides include:
· The nitrogen-fixing, legume family of plants such as peas, beans, lentils, and clover
· The nightshade, solanaceous family of plants such as tomatoes and potatoes
· The sunflower, composites family of plants such as sunflower, petunias, daisies, lettuce, and asters
· The cucumber, cucurbit family of plants such as cucumber, squash, pumpkin, and watermelon
Damaged plants may show on or more of the following symptoms:
Stunted growth: the main growth tip stops growing and the lateral buds begin to grow
· Reduced fruit set
· Cupping of leaves
· Failure of secondary leaves to grow after the seed leaves emerge
· In legumes, compound leaves stay single
Depending on the type of herbicide and the level of concentration in the soil, persistent herbicides can last anywhere from several months to three or more years before completely breaking down into inert compounds. The length of time depends upon a variety of factors, including the type and moisture content of the soil.
The most common feed stocks with persistent herbicide contamination are manures and bedding, but grass clippings and many food items can be contaminated.
Persistent pesticides do not break-down in the composting process. At its most fundamental level, composting is digestion by microorganisms, regardless of whether it is an aerated static pile, anaerobic digestion, etc. Simple composting math demonstrates that one ton of feedstock reduces to approximately half that amount as finished compost.
Persistent herbicides break down much more slowly than the materials in compost, and therefore, most of the chemicals pass into the finished compost. Low toxicity to animals is one often cited benefit of persistent herbicides.
According to the USEPA, persistent herbicides are not harmful to people or animals when these products are used at labelled rates.
Pyridine and its derivatives:
Environmental fate:
The atmospheric photodegradation estimates for the Pyridine and Pyridine Derivatives Category chemicals indicate that piperidine which is the lower molecular weight, non-aromatic and unsubstituted chemical in the category, would be expected to degrade rapidly (t1/2 < 1 day) when exposed to UV light in the atmosphere. Pyridine and the three methyl derivatives of pyridine (picolines) which are the higher molecular weight, aromatic and substituted chemicals in the category, would be expected to photodegrade more slowly (t1/2 . 30 or 10 days, respectively). , Lutidines, and collidines are expected to photodegrade even more slowly. The nitriles derivatives of pyridine are also predicted to photodegrade more slowly (t1/2 . 164 days). However, the nitrile derivatives of pyridine were predicted to partition to air much less favorably than to soil and water. As molecular weight and substitution increase in the category, greater distribution to water and soil and less to air is predicted. This trend is consistent with the vapor pressure data.
Pyridines are not expected to hydrolysis in the environment because they lack a potentially hydrolysable functional group.
There are adequate measured data across the pyridine group to allow the conclusion that these chemicals are biodegradable in the presence of adequate oxygen and bacteria; however, they are relatively stable under anaerobic and/or sterile environments**.**
Depending upon the environmental conditions, different types of bacteria, fungi, and enzymes are involved in the degradation process of these compounds . Different organisms are using different pathways to biotransform a substrate The transformation rate of the pyridine derivatives is dependent on the substituents . For example, pyridine carboxylic acids have the highest transformation rate followed by mono-hydroxypyridines, methylpyridines, aminopyridines, and halogenated pyridines
Ecotoxicity:
Measured values for acute aquatic toxicity indicate that the Pyridine and Pyridine Derivatives Category chemicals are slightly to moderately toxic to fish, invertebrates and algae.
Modeled data for acute aquatic toxicity were generally consistent with the reliable measured values in cases for which both existed.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
clopyralid	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
clopyralid	LOW (LogKOW = 1.06)

Mobility in soil

Ingredient	Mobility
clopyralid	LOW (Log KOC = 38.81)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	‣ Containers may still present a chemical hazard/ danger when empty. ‣ Return to supplier for reuse/ recycling if possible. Otherwise: ‣ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. ‣ Where possible retain label warnings and SDS and observe all notices pertaining to the product.

Continued...

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- **DO NOT** allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

SECTION 14 Transport information

Labels Required



Marine Pollutant



HAZCHEM •3Z

Land transport (ADG)

14.1. **UN number or ID number**	3082
14.2. **UN proper shipping name**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains clopyralid)
14.3. **Transport hazard class(es)**	Class: 9 Subsidiary Hazard: Not Applicable
14.4. **Packing group**	III
14.5. **Environmental hazard**	Environmentally hazardous
14.6. **Special precautions for user**	Special provisions: 274 331 335 375 AU01 Limited quantity: 5 L

Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082
are not subject to this Code when transported by road or rail in;
(a) packagings;
(b) IBCs; or
(c) any other receptacle not exceeding 500 kg(L).
- Australian Special Provisions (SP AU01) - ADG Code 7th Ed.

Air transport (ICAO-IATA / DGR)

14.1. **UN number**	3082
14.2. **UN proper shipping name**	Environmentally hazardous substance, liquid, n.o.s. (contains clopyralid)
14.3. **Transport hazard class(es)**	ICAO/IATA Class: 9 ICAO / IATA Subsidiary Hazard: Not Applicable ERG Code: 9L
14.4. **Packing group**	III
14.5. **Environmental hazard**	Environmentally hazardous
14.6. **Special precautions for user**	Special provisions: A97 A158 A197 A215 Cargo Only Packing Instructions: 964 Cargo Only Maximum Qty / Pack: 450 L Passenger and Cargo Packing Instructions: 964 Passenger and Cargo Maximum Qty / Pack: 450 L Passenger and Cargo Limited Quantity Packing Instructions: Y964 Passenger and Cargo Limited Maximum Qty / Pack: 30 kg G

Continued...

Sea transport (IMDG-Code / GGVSee)

14.1. **UN number**	3082
14.2. **UN proper shipping name**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains clopyralid)
14.3. **Transport hazard class(es)**	IMDG Class: 9 IMDG Subsidiary Hazard: Not Applicable
14.4. **Packing group**	III
14.5 **Environmental hazard**	Marine Pollutant
14.6. **Special precautions for user**	EMS Number: F-A, S-F Special provisions: 274 335 375 969 Limited Quantities: 5 L

14.7. Maritime transport in bulk according to IMO instruments

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
clopyralid	Not Applicable

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
clopyralid	Not Applicable

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

clopyralid is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Additional Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	No (clopyralid)
Canada - NDSL	Yes
China - IECSC	No (clopyralid)
Colombia - Colombia National Industrial Chemicals Inventory	No (clopyralid)
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (clopyralid)
Korea - KECI	No (clopyralid)
New Zealand - NZIoC	Yes
Philippines - PICCS	No (clopyralid)
USA - TSCA	All chemical substances in this product have been designated as TSCA Inventory 'Active'
Taiwan - TCSI	Yes
Mexico - INSQ	No (clopyralid)
Vietnam - NCI	Yes
Russia - FBEPH	No (clopyralid)
UAE - Control List (Banned/Restricted Substances)	No (clopyralid)
Legend:	***Yes = All CAS declared ingredients are on the inventory*** ***No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.***

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SECTION 16 Other information

Revision Date	23/10/2026
Initial Date	23/10/2026

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

- PC—TWA: Permissible Concentration-Time Weighted Average
- PC—STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit。
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration
- MARPOL: International Convention for the Prevention of Pollution from Ships
- IMSBC: International Maritime Solid Bulk Cargoes Code
- IGC: International Gas Carrier Code
- IBC: International Bulk Chemical Code

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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