ENVIRONMENTAL RISK MANAGEMENT AUTHORITY DECISION

17 August 2007

Application Code	HRE05001
Application Type	To reassess a hazardous substance under section 63 of the Hazardous Substances and New Organisms Act 1996 ("the Act")
Applicant	New Zealand Business Council for Sustainable Development
Application Received	17 October 2006
Submission Period	1 November – 13 December 2006
Hearing date	20 June 2007
Considered by	A Committee of the Authority ("the Committee")
Purpose of the Application	To reassess substances containing clopyralid used to control weeds in forestry, agriculture, turf and lawns

1 Summary of decision

1.1 Following consideration of the application for reassessment, the Committee has

- Approved, subject to controls, the manufacture and importation of the substances listed in Table 1.1;

Table 1.1 Approved substances containing clopyralid.

Substance name	HSNO approval number
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance A)	HSR000760
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance B)	HSR000761
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine (MEA) salts	HSR000762
Clout	HSR007682

- modified the classifications and the identification, approved handlers and tracking controls as shown in Table 1.2;

Table 1.2 Classifications and control modifications.

Substance name	Classification	Identifiers	Approved handlers	Tracking
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance A)	9.1B, 9.2A, 9.3C	Ecotoxic herbicide. Not for use in home gardens. Do not use for treating turf that will be mown and the clippings used for making compost; or made available for collection for, or deposited at, a municipal green waste recycling depot.	These substances must be under the personal control of an approved handler when being applied in any quantity.	These substances shall only be sold to an approved handler.
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance B)				
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine (MEA) salts	6.4A 9.1C, 9.2A, 9.3C	Not to be used on turf. Treated vegetation shall not be disposed of at any green waste recycling centre.		
Clout	6.1E, 6.4A, 6.5B, 9.1A, 9.2A			

- revoked the approval for the importation or manufacture of soluble concentrates containing 30 g/litre clopyralid (HSNO approval no. HSR000759). This revocation takes effect 12 months from the date of this decision and affects the trade-name product, No Lawn Weeds, marketed by Kiwicare Corporation Limited.

2 Legislative criteria for application

2.1 The application was lodged by the applicant pursuant to section 63 following grounds for reassessment having been established under section 62 by the Authority in its decision dated 1 May 2002. This reassessment decision was determined in accordance with section 29, taking into account additional matters to be considered in that section and matters relevant to the purpose of the Act, as specified under Part II of the Act. Unless otherwise stated, references to section numbers in this decision refer to sections of the Act

2.2 Consideration of the application followed the relevant provisions of the Methodology. Unless otherwise stated, references to clauses in this decision refer to clauses of the Methodology.

3 Application process

3.1 The application was formally received on 17 October 2006.

3.2 In accordance with sections 53(1) and 53A, and clauses 2(2)(b) and 7, public notification was made on 1 November 2006 (on ERMA New Zealand's web site) and the application was advertised in the four main newspapers (New Zealand Herald, Dominion Post, Christchurch Press and Otago Daily Times) on 8 November 2006.

3.3 Submissions closed on 13 December 2006, 30 working days after public notification.

3.4 Various Government departments, Crown Entities and interested parties, including the New Zealand Food Safety Authority (Agricultural Compounds and Veterinary Medicines (ACVM) Group), the Ministry of Health and the Department of Labour Work Place Group, which in the opinion of the Authority would be likely to have an interest in the application, were notified of the receipt of the application (sections 53(4) and 58(1)(c), and clauses 2(2)(e) and 5) and provided with an opportunity to comment or make a public submission on the application.

3.5 The Agency received seventeen submissions on this application from turf managers, product manufacturers, local authorities, sports field managers and one researcher. No submissions were received from home gardeners.

3.6 Of these submissions, five submitters indicated that they wished to be heard in support of their submissions at a public hearing.

3.7 The Agency was commissioned to prepare an Evaluation and Review Report (the E&R Report) to aid the Committee with its decision making process. The E&R Report consists of the Agency's review of the application, the submissions and available data regarding the substances and/or their constituent components. In the E&R Report, the Agency reviewed the hazard classifications of substances containing clopyralid. The Agency also evaluated the risks, costs and benefits associated with alternative scenarios relating to the availability of the substances and the effectiveness of controls proposed by the applicant.

3.8 The Ministry of Health, the Department of Labour, the New Zealand Food Safety Authority (Agricultural Compounds and Veterinary Medicines (ACVM) Group), and the applicant were given the opportunity to comment on the E&R Report and the controls proposed therein. No responses were received.

3.9 No external experts were used in the consideration of this application (clause 17).

3.10 The hearing was postponed under section 58 to allow the Agency sufficient time to complete its evaluation and review of the application. A public hearing was held in Wellington on 20 June 2007.

3.11 The following members of the Authority's Hearings Committee considered the application in accordance with a delegation under section 19(2)(b): Dr Max Suckling (Chair) and Dr Kieran Elborough.

3.12 The information available to the Committee comprised:

- the application, including confidential appendices;
- the submissions;
- the Agency's Summary of Submissions and E&R Report;
- information presented at the hearing.

4 Consideration

Purpose of the application

4.1 The purpose of the application was to reassess substances containing clopyralid used to control weeds in forestry, agriculture, turf and lawns.

Sequence of the consideration

4.2 In accordance with clause 24, the Committee's approach to the consideration was to:

- review the available information;
- establish the hazard classifications for substances containing clopyralid and derive the controls that are prescribed under section 77 for each classification;
- identify potentially non-negligible risks, costs, and benefits;
- assess the potentially non-negligible risks and costs;
- determine whether the default controls, prescribed under section 77, should be varied and identify where additional controls need to be applied, under section 77A, to mitigate any unacceptable risks;
- undertake a combined consideration of all the risks and costs and determine whether the combined risks and costs are negligible or non-negligible;
- taking into account the risk characteristics established under clause 33, evaluate the risks, costs and benefits in accordance with clause 34 and determine whether the application should be approved or declined under clauses 26, 27 and section 29;
- consider the cost-effectiveness of the application of controls in accordance with clause 35 and sections 77 and 77A;
- confirm and set the controls.

4.3 In the risk assessments, risks were assessed in accordance with clause 12, costs in accordance with clause 13 and benefits in accordance with clauses 9, 11, 13 and 14 and section 6(e).

Information review

4.4 In the E&R Report, the Agency concluded that, on the weight of the evidence, the information provided by the applicant and the further information available to the Agency constitutes an adequate and appropriate basis for considering the application.

4.5 However, the Agency specifically identified areas where uncertainty in the information exists. These areas are:

4.5.1 The Agency considers that much of the information presented by the applicant on the effects of clopyralid contamination in compost only amounts to anecdotal evidence. This is because the methods used for the studies were not given or the methodologies used had significant shortcomings. The studies provided by the applicant and other studies accessed by the Agency are reviewed in Section 6 of the E&R Report.

4.5.2 While the results of some studies were considered acceptable for Agency use, the Agency considers that caution should be applied with regard to generalisation of overseas study results to New Zealand conditions.

4.6 The risk management framework used by the Authority requires consideration of uncertainty. Clause 8 requires the Authority to be mindful of the scale and significance of the risks, costs and benefits when reviewing the information available. In addition, according to clause 29, when there is scientific and technical uncertainty or disputed information, the Authority must determine the materiality and relevance of that uncertainty. If such uncertainty cannot be resolved, clause 30 requires the Authority to take into account the need for caution in managing the adverse effects of the substance.

4.7 The Committee has reviewed the available information and, while acknowledging that many of the studies relied on by the applicant do have significant shortcomings, the Committee is satisfied that clopyralid does pose a significant contamination risk to compost manufactured from material that has been previously treated with it.

4.8 In this regard, the Committee notes that none of the parties that attended the hearing dispute this.

4.9 The Committee also acknowledges that there is some uncertainty as to the magnitude of the adverse effects this contamination may cause but is satisfied that the available information is relevant and appropriate and is sufficient to demonstrate that the effects are of a sufficient magnitude to warrant attention under the Act.

Hazard classification

4.10 The Committee has classified substances containing clopyralid as follows:

Table 4.1: Hazard profiles of substances containing clopyralid approved in New Zealand.

Substance description and approval number	Trade name products	Hazard classification
Soluble concentrate containing 30 g/litre clopyralid HSNO Approval Number: HSR000759	No Lawn Weeds Clover and Prickle	9.1C, 9.2A
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance A) HSNO Approval Number: HSR000760	Clopyd 300; Void; Tango; Vivendi 300; Multiple; Contest; Pirate 300; Cardo	9.1B, 9.2A, 9.3C
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance B) HSNO Approval Number: HSR000761	Versatill Herbicide; Archer; AGPRO Cloralid 300	9.1B, 9.2A, 9.3C
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine salts* HSNO Approval Number: HSR000762	Radiate	6.4A 9.1C, 9.2A, 9.3C
Clout (contains 478.8 g/litre terbuthylazine and 12.75 clopyralid) HSNO Approval Number: HSR007682	Clout	6.1E, 6.4A, 6.5B, 9.1A, 9.2A

* In the E&R Report the Agency proposed to give "Radiate" a 6.5B (skin sensitisation) classification. However, a subsequent review of the available data has shown that this classification should not be applied.

Controls

4.11 In the E&R Report, the Agency assigned controls for the substances based on their hazardous properties as set out in the HSNO Regulations. These controls were used as a reference for evaluation of the application in the E&R Report. The controls are listed in Appendix E of the E&R Report and have not been reproduced here.

Lifecycle

4.12 The Committee notes that substances containing clopyralid are available in New Zealand containing either 30% or 3% of clopyralid for large-scale or domestic (that is household) use, respectively.

4.13 The substances are intended for the control of specific problem weeds primarily by:

- commercial growers of various crops and plantations. The substances are used to control weeds in crops such as asparagus, beets, cereals, maize and sweetcorn. They are also used to control weeds in conservation tillage (brassicas, cereals, ryegrass), field/forage brassicas, forests, pasture, ornamental trees and orchards;
- organisations managing ornamental trees, turf and amenity areas;
- domestic users for home lawns and turf to control clover, broadleaf weeds and cape daisy.

Adverse effects

4.14 Based on their hazardous properties and their lifecycles, substances containing clopyralid have the potential to cause adverse effects to:

- workers involved in the manufacture of the substances;
- workers and bystanders should an incident occur in transportation of the substances;
- users of the substances in forestry and agriculture;
- the environment from spraydrift or spillage;
- the relationship of Māori to the environment through exposure of water, soil and native flora and fauna to the substances.

4.15 In April 2002, the Authority decided that there were grounds for reassessment of substances containing clopyralid, namely that significant new information had become available relating to the contamination of compost that is made from vegetation that has been previously treated with a substance containing clopyralid.

4.16 In the following reassessment of substances containing clopyralid, the Committee has thus taken into account both the effects arising from the hazardous properties of substances containing clopyralid and the effects that clopyralid has on susceptible plants treated with contaminated compost.

Identification of the potentially non-negligible risks, costs and benefits

4.17 In accordance with sections 5 and 6 and clauses 9 and 12, the Committee has identified and assessed the potentially non-negligible risks of substances containing clopyralid in terms of risks to the environment, to human health and safety, to the relationship of Māori with the environment, to society and the community and to the market economy.

Identification of potentially non-negligible risks (adverse effects)

4.18 The potentially non-negligible risks and costs associated with substances containing clopyralid arise from their hazardous properties and from the effects that clopyralid residues may have on susceptible plants treated with contaminated compost.

4.19 As the substances containing clopyralid that are used on amenities, turf and domestic lawns do not trigger any toxicity classifications, the occupational risks arise from use in agriculture and forestry only.

4.20 The primary adverse effects on the health of the general public are effects on bystanders resulting from spray drift of substances containing clopyralid, used for agriculture and forestry.

4.21 The environmental effects that are considered potentially non-negligible are:

- effects on aquatic organisms resulting from application of the substances;
- effects on groundwater resulting from application of the substances;

- effects of spray drift resulting in exposure to non-target organisms to the substances;
- effects resulting from the disposal of vegetation that has been treated with the substances.

4.22 The potentially non-negligible effects on society and communities are:

- the inconvenience associated with domestic garden green waste containing grass clippings not being able to be used to make compost and either having to be maintained on site or disposed of in landfill;
- the selection/acquisition of land and creation of new landfill facilities due to the increased usage associated with green waste disposal.

4.23 The significant effects on the market economy under the current use scenario are:

- the financial cost to local authorities of having to dispose of grass clippings into landfill;
- the financial costs to manufacturers of compost related to the testing of compost and the need to dispose of contaminated product rather than being able to market it.

Identification of potentially non-negligible costs

4.24 A "cost" is defined in Regulation 2 of the Methodology as "the value of a particular adverse effect expressed in monetary or non-monetary terms". Accordingly, the costs were assessed in an integrated fashion together with the risks in the Committee's assessment.

Identification of potentially non-negligible benefits

4.25 A "benefit" is defined in Regulation 2 of the Methodology as "the value of a particular positive effect expressed in monetary or non-monetary terms". Benefits that may arise from any of the matters set out in clauses 9 and 11 were considered in terms of clause 13.

4.26 Substances containing clopyralid present benefits to human health in that those substances currently used for commercial and domestic purposes on turf, amenity areas and household lawns do not trigger any HSNO human toxicity thresholds.

4.27 The potentially significant environmental benefits of substances containing clopyralid are that they pose lower environmental risks than alternative substances, other than the risks posed to susceptible plants grown in compost made from treated vegetation.

4.28 Substances containing clopyralid are beneficial to society and communities in that usage of the substances includes turf and amenity areas where there are often problem weeds present. These include onehunga weed, thistles, dandelion, plantains, daisies, yarrow and clover. These weeds can produce problems to persons using such areas, giving rise to prickles in bare feet and stings from bees present on flowers. The presence of clover can make sports fields slippery and therefore dangerous to play on. In addition, weed control may be desirable for aesthetic reasons or specific playing field requirements.

4.29 The beneficial effects to the market economy of substances containing clopyralid derived from the beneficial effects on society and communities; in other words, the economic benefits of the availability of a single substance that will effectively and without a human health risk control weeds in turf and amenity areas.

4.30 The substances also pose benefits to the agricultural and forestry industries by providing an effective means of weed control.

Assessment of the potentially non-negligible risks

4.31 The Committee considered the quantitative analyses carried out by the Agency on the risks to human health and the environment from the use of the substances. A qualitative assessment has been undertaken for all other stages of the lifecycles. For the qualitative assessments, the level of risk has been evaluated on the basis of the magnitude and likelihood of adverse effects occurring to people or the environment (see Appendix 1 for a description of the qualitative descriptors).

Assessment of the potentially non-negligible risks - human health

4.32 The Committee notes that, under the revised HSNO classification of substances containing clopyralid, the only two substances that trigger human toxicity thresholds are those used for agriculture and forestry purposes.

4.33 "Radiate" is designed for use in controlling broadleaf weeds in fodder brassicas and radiata pine. Under its current HSNO approval there are no restrictions on where it may be applied. However, it is not used on turf and has no approved label claim for this use under the Agricultural Compounds and Veterinary Medicines Act 1997 ("the ACVM Act").

4.34 Clout is designed for use in forestry. Under its current HSNO approval there are no restrictions on where it may be applied. However, under the ACVM Act it is approved for use as a herbicide for the control of gorse, broom and a number of grass weeds in redwoods and other sensitive conifer species.

4.35 The Agency carried out quantitative exposure modelling based on the New Zealand turf use pattern to determine the level of risk to operators from the use of substances containing clopyralid.

4.36 The Agency concluded that clopyralid is **unlikely to pose a risk to operators**. This is based on the risk quotients (RQs) being <1, even in the absence of personal protective equipment (PPE). In the absence of PPE, the estimated exposure represents 4% of the Acceptable Operator Exposure Level (AOEL) indicating a significant margin of safety to workers.

4.37 As the quantitative modelling of operator exposure indicated that there is unlikely to be risk to operators from clopyralid, even in the absence of PPE, the Committee considers that the use of clopyralid is **unlikely to pose a risk to bystanders**.

Assessment of the potentially non-negligible risks – environment

4.38 The Committee assessed the potentially non-negligible adverse environmental effects identified above on the basis that substances containing clopyralid are available to all industry sectors and that the current HSNO controls apply.

4.39 The Agency used the GENEEC2 surface water exposure model (US EPA, 2001) to estimate the surface water concentrations which may potentially arise from the New Zealand turf use pattern as a result of spray drift and surface runoff.

4.40 For other phases of the lifecycles of the substances, the Agency used the ERMA New Zealand qualitative descriptors for environmental effects (See Appendix 1).

4.41 Based on the results of the GENEEC2 modelling, the Committee considers that, when used according to good agricultural practice, clopyralid presents a **low acute risk** to the aquatic environment.

4.42 The Committee notes that the potential for leaching or runoff of clopyralid is functionally reduced by the relatively rapid degradation of the substance in soil. Accordingly, the Committee is satisfied that the risk of leaching and subsequent contamination of ground water is **negligible**.

4.43 The Agency also reported that the GENEEC2 and phyto-toxicity modelling shows that, when clopyralid is applied in a manner consistent with the New Zealand turf use pattern, it does not pose a high risk to non-target plants directly outside the target area. The Committee is therefore satisfied that this risk is **negligible**.

Environmental effects resulting from the disposal of vegetation previously treated with substances containing clopyralid (current availability)

4.44 The Committee considers the disposal of clippings from treated turf to be the major environmental risk. The use of clippings for compost or mulch is by either the large-scale operations of local authorities and commercial organisations, or small-scale use by domestic gardeners.

4.45 The Committee is satisfied that clopyralid is very likely to contaminate compost if it is made from green waste from vegetation that has been treated with a substance containing clopyralid.

4.46 As contaminated green waste cannot be used for making compost it has to be disposed of by other means. The resulting environmental effects of this contamination are the requirement for the allocation of additional areas of land for landfill purposes and the adverse environmental effects associated with additional transport and processing of the waste material.

4.47 These effects are difficult to quantify; however, the Committee notes that, according to information supplied by the applicant, garden waste from domestic sources represents approximately 20 % of the average municipal solid waste stream, 800,000 tonnes per year. Thus the inability to recycle large amounts of green waste may have a significant impact on the area of land required for landfill purposes.

4.48 The Committee acknowledges that there is considerable uncertainty about the magnitude of this adverse effect. However, the Committee is satisfied that a **minor** effect is **very likely** to occur and a **moderate** effect **is likely** to occur. Thus the level of environmental risk of clopyralid contamination of compost is assessed as **high**.

4.49 With regard to amenity and turf use, the Committee notes that it is standard practice for turf clippings not to be caught or to be disposed of on site and therefore they will have little impact on the rate of fill at landfills. Thus, the Committee is satisfied that a **minor** effect is **very unlikely** to occur. Therefore, the level of environmental risk of clopyralid contamination of compost from the amenity and turf sector is assessed as **low**.

Relationship of Māori to the environment

4.50 As clopyralid possesses ecotoxic and toxic properties the potential exists for products containing the substance to affect the mauri of taonga flora and fauna, the environment and the general health and well-being of individuals and the community.

4.51 In particular, the Agency accepted that clopyralid persists during the composting process and poses a risk to susceptible plants both potentially valued native and/or taonga flora grown in such compost.

4.52 The Agency also considered that contamination of compost gives rise to potential Māori cultural adverse impacts in that the contaminated green waste has to be disposed of in landfill rather than be recycled.

4.53 The Committee is satisfied that the analysis of effects on Māori culture are sufficiently covered by the analysis of effects across human health and safety, the environment, society and community and the market economy and need not therefore be examined further.

Assessment of the potentially non-negligible risks - society and communities

Issues regarding disposal of green waste containing grass clippings

4.54 Substances containing clopyralid are used for commercial and large scale turf care for golf courses, school grounds, council grounds and similar amenities. Most of these users are aware of the problems involved with composting of green waste containing clopyralid residues and compost or dispose of grass clippings on site.

4.55 Domestic garden contractors operating mowing services and garden cleanup take green waste off site; however, they may not necessarily know the care history of the lawn. It is likely that some of the clippings that they collect will be contaminated with clopyralid.

4.56 The effects identified above primarily impact on the domestic sector. As far as the Committee has been able to determine, council waste facilities do not accept grass clippings as 'green waste'. Therefore, there is an adverse effect on society and communities resulting from the reduced choice of disposal options and the added

costs of disposal experienced by domestic gardeners who are unable to compost their lawn clippings or mixed garden waste.

4.57 The Committee concludes that for the lawn care contracting market the adverse effect is **negligible** since contractors will be aware of alternative means of disposing of clippings. For the domestic market the Committee concludes that a **minimal** effect is **very unlikely**, and thus this adverse effect is **negligible**.

Issues regarding new landfill facilities

4.58 The selection/acquisition of land and creation of new landfill facilities would occur more readily due to the increased usage associated with green waste disposal. The selection of these sites is often controversial and has far reaching social and economic effects to society and communities.

4.59 The applicant has provided information regarding the costs of disposing of green waste that might otherwise be used for compost. This is summarised as follows:

- garden waste represents approximately 20% of the solid waste stream or 800,000 tonnes per year;
- disposal of garden waste in landfill has been variously valued at $50 per tonne by the Ministry for the Environment and in excess of $88 per tonne by Environment Canterbury;
- the range of cost of disposal is thus $40-70 M per annum;
- in the Canterbury region two thirds of compost samples are sent to landfill (time period unknown).

4.60 The Committee notes that there is considerable uncertainty about the size of this effect and, in making its assessment, the Committee has adopted a conservative approach. The Committee further notes that this effect may result from the actions of both domestic gardeners and the agriculture and forestry and amenity sectors.

4.61 The Committee notes that it is difficult to make a reliable estimate of the adverse effects on society and communities and the economy due to the need of additional landfill space. However, the Committee considers that the information available is sufficient to establish that a **moderate** effect is **likely**. Therefore, the level of risk is **high**.

Assessment of the potentially non-negligible risks - market economy

4.62 The cost to local authorities from having to dispose of grass clippings into landfill is associated with environmental and social effects and has been assessed under those categories.

4.63 The applicant indicated that the cost of clopyralid contamination of compost via treated turf is significant for the compost industry. The laboratory costs of analysing the level of clopyralid residues in compost are $184-250 per sample.

4.64 The applicant also indicated that 800,000 tonnes of green waste is produced each year. This amount of green waste will produce approximately 800,000 cubic meters

of compost valued at approximately $50 per cubic meter. This gives a total value to the compost of around $40,000,000.

4.65 As very small amounts of clopyralid (e.g. a concentration in compost in the order of 10 ppb) can harm susceptible plants, contaminated clippings cannot be used to make compost and contaminated compost will be significantly reduced in value. Accordingly, the Committee accepts that potential costs to manufacturers of compost range form **moderate** to **major** and that these effects are **likely** to occur. Therefore, the level of risk ranges from **high** to **extreme**.

Overall evaluation of risks and costs

4.66 The risks and costs assessed above are summarised in Table 4.1.

Table 4.1 Summary of level of risks associated with the current availability.

Adverse effect		Likelihood	Magnitude	Level of Risk
Human health	Operators	Unlikely to pose a risk		Negligible
	Bystanders	Unlikely to pose a risk		Negligible
Environment	Spray drift/surface runoff	Low acute risk		Negligible
	Disposal of treated vegetation (Amenities)	Very unlikely	Minor	Low
Society and Communities	Disposal of treated vegetation – inconvenience (Domestic)	Very unlikely	Minimal	Negligible
Environment/Society and Communities/ market economy	New landfill sites for disposal of treated vegetation (Domestic)	Likely	Moderate	High
		Very likely	Minor	High
Market economy	Compost makers	Likely	Moderate to major	High to extreme

Agriculture and forestry

4.67 The Committee considers that substances containing clopyralid used for agricultural and forestry purposes do not pose any non-negligible risks as they are adequately managed by existing controls and the treated vegetation is not likely to end up in the compost stream. Therefore, the Committee has not further considered the risks, costs and benefits in these industry sectors.

5 Modification of controls

5.1 The above assessment of the risks and costs of substances containing clopyralid took into account the application of the controls for the substances based on their hazardous properties as set out in the HSNO Regulations (See Appendix E of the E&R Report).

5.2 Under section 77, the default controls determined by the hazardous properties of a substance may be varied and, under section 77A, the Authority may impose as controls any obligations and restrictions that it thinks fit.

5.3 To mitigate the non-negligible risks identified in Table 4.2, the Committee has modified the controls on substances containing clopyralid as described in the following paragraphs.

Additional controls under section 77A

5.4 Under section 77A, the Authority may impose as controls any obligations and restrictions that it thinks fit. Before imposing a control under this section, the Authority must be satisfied that, against any other specified controls that apply to the substance:

(a) the proposed control is more effective in terms of its effect on the management, use and risks of the substance; or

(b) the proposed control is more cost-effective in terms of its effect on the management, use and risks of the substance; or

(c) the proposed control is more likely to achieve its purpose.

Labelling

5.5 As the default controls do not restrict the use of substances containing clopyralid, the Committee has imposed the following identification requirements under section 77A as they are considered to be more effective in managing the adverse effects of the substances than the default controls.

5.6 Accordingly, controls codes I3, I11 and I23 (Regulations 9, 20 and 41 of the Hazardous Substances (Identification) Regulations 2001) are varied under section 77A as shown in Table 5.1.

Table 5 1. Variation to identification controls.

Substance	I3, Priority Identifiers	I11, Secondary Identifiers	I23, Documentation Requirements
soluble concentrates containing 30 g/litre clopyralid			
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substances A and B)	The priority identifiers shall include the statement: *"Ecotoxic herbicide. Not for use in home gardens."*	The secondary identifiers shall include the statement: *"Do not use for treating turf that will be mown and the clippings used for making compost; or made available for collection for, or deposited at, a municipal green waste recycling depot."*	The documentation shall include the following precautionary information: *"Ecotoxic herbicide. Do not use for treating turf that will be mown and the clippings used for making compost; or made available for collection for, or deposited at, a municipal green waste recycling depot."*
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine salts. Clout (contains 478.8 g/litre terbuthylazine and 12.75 clopyralid)	The priority identifiers shall include the statement: *"Ecotoxic herbicide. Not to be used on turf."*	The secondary identifiers shall include the statement: *"Treated vegetation shall not be disposed of at any green waste recycling centre."*	The documentation shall include the following precautionary information: *"The substance is not to be used on turf."* And that *"Treated vegetation shall not be disposed of at any green waste recycling centre."*

5.8 The Committee considers that these identification controls will further mitigate the high level of risk to the environment, society and communities and the market economy.

Variation of controls under section 77

5.9 Under section 77(3), (4) and (5), the default controls determined by the hazardous properties of a substance may be varied.

Approved Handlers

5.10 The default approved handler control, regulation 9 of the Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001, is triggered by the 9.2A classification of the substances. This control requires the substances to be under the control of an approved handler at all times. On transfer of the substances to the Act, this control was varied so that it only applies when the substances are applied in a wide-dispersive manner or by a commercial contractor.

5.11 The Committee agrees that the approved handler control should only apply to the application (spraying) of the substances. However, because the risks involved could arise from any application, not just wide-dispersive use or use by a contractor, the Committee now requires that any application of the substances be under the control of an approved handler.

5.12 As approved handlers will be aware of the risks associated with clopyralid and will be trained in using agrichemicals in strict accordance with their labels, the Committee considers that an approved handler requirement, in conjunction with the identification requirements will further mitigate the level of risk to risk to the environment, society and communities and the market economy.

5.13 Accordingly, the approved handler control is varied so that regulation 9 applies to the substances as if subclause (1) were omitted and the following substituted:

(1) The substance must be under the personal control of an approved handler when the substance is used in any quantity.

5.14 This modification is made under section 77(3)(a) as the adverse effects on the environment, society and communities and the market economy identified for the substances are greater than the adverse effects which would usually be associated with substances with a class 9.2A classification.

Tracking

5.15 The default tracking controls, regulations 4 to 6 of the Hazardous Substances (Tracking) Regulations 2001, are also triggered by the 9.2A classification of the substances. On transfer of the substances to the Act these controls were deleted.

5.16 The Committee considers that while the risks associated with the substances do not justify retention of these controls up to the point of sale, the Committee considers that they should be retained at the point of sale to ensure that people who purchase them are aware of the risks involved with their inappropriate use.

5.17 Accordingly, the Committee has varied the tracking controls under section 77(4)(b) as follows:

The Hazardous Substances (Tracking) Regulations 2001 apply as if regulations 4 to 5 were omitted.

The regulations apply as if regulation 6 was omitted and the following substituted:

6 (1) The person in charge of a place where the substance is sold may sell the substance to a person only if he or she has received confirmation that the person holds a test certificate as an approved handler of the substance.

5.18 This modification is made under section 77(3)(a) as the adverse effects on the environment, society and communities and the market economy identified for the substances are greater than the adverse effects which would usually be associated with substances with a class 9.2A classification.

Pack size

5.19 The Agency proposed that substances containing clopyralid should only be available in a minimum pack size of one litre. However, the Committee does not consider that such a restriction will be more effective than other controls in mitigating the adverse effects that the domestic use of substances containing clopyralid have on the environment, society and communities and the market economy.

6 Approach to risk and precautionary approach

Approach to risk

6.1 Clause 33 requires the Authority to have regard for the extent to which a specified set of risk characteristics exist when considering individual risks. This provides means of determining how cautious or risk averse the Authority should be in weighing up adverse effects (risks and costs) and beneficial effects (benefits).

6.2 The Committee notes that the non-negligible risks associated with the current use of substances containing clopyralid relate to:

- environmental effects associated with the disposal of treated vegetation in the amenities sector;
- effects on the environment, society and communities and the market economy from the creation of new landfill sites to accommodate the disposal of treated vegetation from the domestic sector;
- costs to compost makers from the contamination of compost by clopyralid residues.

6.3 The Committee considers that a cautious approach should be taken to weighing up the benefits of substances containing clopyralid and the risks and costs associated with their use as:

- the risks will persist over time;
- the risks extend in their effects beyond the immediate location of contamination;

- the potential adverse effects are irreversible; and
- the risks are neither known nor well understood by the public as they keep occurring despite advice that is provided with the products.

Precautionary approach

6.4 Section 7 requires the Authority to take into account the need for caution in managing adverse effects where there is scientific or technical uncertainty about those risks or effects. Accordingly, in assessing adverse effects, the Committee has noted that there is uncertainty in the magnitude and likelihood of the potential adverse effects and has thus been conservative in determining the level of the adverse effects.

7 Assessment of the potentially non-negligible benefits

Assessment of the potentially non-negligible benefits - human health

7.1 The Committee is satisfied that there are human health benefits to be gained from the availability of herbicides of low toxicity especially for amenity, turf and domestic use, particularly for the effective control of weeds such as clover and thistles.

7.2 For the amenities and turf sectors, the Committee considers that the level of the beneficial human health effects is **moderate** and that the likelihood of the effects occurring is **likely**. The level of effect is **high.**

7.3 However, for the domestic sector, the Committee considers that the level of the beneficial human health effects is **minimal** and that the likelihood of the effects occurring is **likely**. The level of effect is **medium.**

Assessment of the potentially non-negligible benefits - environmental

7.4 The potentially significant benefits of substances containing clopyralid are that they pose lower environmental risks than alternative substances, other than those posed to susceptible plants grown in compost made from treated vegetation. However, as the risks of alternative substances are adequately managed by HSNO controls and controls under other legislation, the Committee considers the level of environmental benefits associated with substances containing clopyralid to be **negligible**.

Assessment of the potentially non-negligible benefits - society and communities

7.5 The Committee accepts that the availability of substances containing clopyralid provides all sectors (domestic gardeners and amenity managers) with an additional product that has a wide efficacy range and is comparatively non-toxic.

7.6 With respect to the amenities sector a **moderate** effect is considered **likely** since these products are effective at ensuring high quality surfaces for recreation and are safe and easy to use. Therefore the level of benefit is **high.**

7.7 With respect to the domestic sector a **minor** to **moderate** effect is considered **likely** since these products are effective at ensuring high quality lawns and are safe and easy to use. Therefore the level of benefit is **high.**

Assessment of the potentially non-negligible benefits - market economy

7.8 The Committee considers that the beneficial effects of the availability of substances containing clopyralid to the market economy are derived from the beneficial effects on society and communities. These benefits have been assessed in Paragraph 7.7 above.

Summary of the potentially non-negligible benefits

7.9 The benefits assessed above are summarised in Table 7.1.

Table 7.1 Summary of level of benefits.

Beneficial effect		**Likelihood**	**Magnitude**	**Level of Benefit**
Human health	Public from use in amenities	Likely	Moderate	High
	Domestic use	Likely	Minimal	Medium
Environment				Negligible
Society and Communities/ Market economy	Amenity use	Likely	Moderate	High
	Domestic use	Likely	Minor to moderate	High

8 Weighing up of risks, costs and benefits

Amenity and turf use

8.1 With regard to amenity and turf use, the Committee has assessed the level of risk associated with substances containing clopyralid to be **negligible** other than a **low** environmental risk of clopyralid contamination of compost. This assessment is based on consideration that it is standard practice for turf clippings from amenity and turf use not to be collected or for them to be disposed of on site.

8.2 The Committee considers that the approved handler, identification and tracking control modifications set out paragraphs 5.5 to 5.18 further mitigate the environmental risks to a **negligible** level.

8.3 The Committee also considers that the level of the beneficial human health and society and community effects are **high** since the substances containing clopyralid are effective at ensuring high quality surfaces for recreation and are safe and easy to use. While alternative substances for weed control will be available, these will have greater adverse effects on human health and it will be difficult for amenity managers to protect members of the public from these adverse effects.

8.4 As the risks of substances containing clopyralid in the amenities and turf sector are negligible, it is evident that the benefits outweigh the costs associated with their use,

and that they may be approved under clause 26 for use in the amenities and turf sector.

Domestic use

8.5 In the domestic sector there are a number of **non-negligible** adverse effects and thus clause 27 applies and the Committee must take into account the extent to which the risks and costs associated with substances containing clopyralid in the domestic sector may be outweighed by benefits.

8.6 The Committee considers that the uncertain **high** to **extreme** levels of risk that substances containing clopyralid pose to the environment, society and communities and the market economy are not outweighed by the **high** level of benefits the substances offer for human health and society and communities. This assessment is based on the consideration that householders will be able to use alternative substances to control lawn weeds and will be able to safely manage any adverse health effects of these substances.

8.7 Clause 34 sets out the process for evaluating the combined impact of risks, costs and benefits. However, the use of common units of measurement is not feasible due to the widely differing nature of the effects.

8.8 The Committee considers that, in the domestic sector, substances containing clopyralid pose:

- a **high** level of risk to the environment, society and communities and the market economy due to the need for new landfill sites for the disposal of treated vegetation;

- a **high** to **extreme** level of risk to the market economy due to the effects on the manufacturers of compost from garden waste.

8.9 The Committee considers that, in the domestic sector, substances containing clopyralid offer:

- a **medium** level of benefit to the human health due to their lower degree of toxicity compared with alternative products;

- a **high** level of benefit to society and communities and the market economy due to their effectiveness in ensuring high quality surfaces for recreation and because they are safe and easy to use.

Likely effects of the substances being unavailable

8.10 Under sections 29(1)(a)(iii) and 29(1)(b)(iii), in considering applications, the Authority is required to consider the likely effects of the substances being unavailable. In this regard, the Committee notes that the effects of the unavailability of substances containing clopyralid on the domestic market relate to:

- increased exposure to alternative substances;

- increased risk of prickles and bee stings;
- poorer quality lawns; and
- loss of income for producers of products for the domestic market.

8.11 The Committee considers that, with regard to the unavailability of substances containing clopyralid on the domestic market, alternative products should cover the gap in the market left by removing the product that is currently available to domestic consumers. Any adverse effects of these substances will be adequately managed by controls on them.

8.12 The Committee also acknowledges that, if substances containing clopyralid were unavailable on the domestic market then there would be an adverse effect on the manufacturer of the current product sold to the domestic gardener. The Committee recognises that this could be of significant concern to this particular manufacturer, but that, in national terms, the impact would be small. Taking into account the apparent limited availability of the product as stipulated by Kiwicare Corporation at the hearing, the Committee has assessed this adverse effect as **minimal** and that the likelihood of this effect of occurring as **very likely**. The Committee further considers that given the very limited nature of the effect the resultant level of effect should be assessed as being **low** rather than high.

Conclusions

8.13 As the risks of substances containing clopyralid in the amenities and turf sector are negligible, the Committee approves the continued manufacture and importation of the remaining substances containing clopyralid subject to controls as set out above.

8.14 Taking into account, the approach to risk, the precautionary approach and the effects of the substances being unavailable, the Committee considers that the high level of adverse effects (risks and costs) to the environment, society and communities and the market economy outweigh the positive effects (benefits) associated with the availability of the substances on the domestic market.

8.15 Accordingly, the Committee **declines** to approve the continued manufacture or importation of the substance designed for use in the domestic sector, **Soluble concentrates containing 30 g/litre clopyralid**.

9 Setting controls

9.1 The applicant and the submitters commented on the proposed controls as set out in the E&R Report. In accordance with clause 35(b), the applicant was also given the opportunity to comment on the further additional controls and the proposal that they become effective in 12 months time.

9.2 The Committee notes the applicant's concerns about a 12 month period before the revocation, handling and tracking controls take effect. However, the Committee considers that the costs to the compost industry associated with the timing of the introduction of new controls need to be balanced against the costs to the manufacturers, distributors and users of the substances.

9.3 Accordingly, the Committee considers that allowing a 12 month transitional period is reasonable, especially considering the long term nature of the adverse effects that are being addressed.

Revocation

9.4 The approval to manufacture or import *Soluble concentrates containing 30 g/litre clopyralid* is revoked.

9.5 To allow for a phase out of the stock in the system, this revocation takes effect on 19 August 2008.

9.6 The Committee applies the default controls as specified to the substances containing clopyralid with the additions and variations set out below.

Additional controls under section 77A

9.7 Controls codes I3, I11 and I23 (Regulations 9, 20 and 41 of the Hazardous Substances (Identification) Regulations 2001) are varied under section 77A as shown in Table 5.1 above.

9.8 To allow the use of labels that have already been printed, these identification requirements do not come into effect when existing label and documentation stocks have been exhausted or 19 August 2009, whichever comes earliest.

Application into or onto water

9.9 The Committee notes that substances containing clopyralid are ecotoxic to the aquatic environment. Accordingly, the Committee considers that the application of an additional control addressing this risk will be more effective than the specified (default) controls in terms of its effect on the management, use and risks of the substance (section 77A(4)(a)). Accordingly, the Committee considers that the following additional control is applied to further mitigate this risk to the environment:

Substances containing clopyralid shall not be applied onto or into water.

Stationary container systems

9.10 The Committee notes that the specified default controls do not address the risks associated with stationary container systems, nor do they allow for dispensation where it is unnecessary for any associated pipework to have secondary containment. Controls to manage these risks were applied to all pesticides transferred to the HSNO regime. These controls are considered necessary for all pesticides, as they are more effective than managing the risks in the absence of such controls.

9.10.1 Accordingly, the Committee considers that these controls are appropriate for the management of the risks associated with substances containing clopyralid and applies them as follows:

"The controls relating to stationary container systems, as set out in Schedule 8 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice

2004 (Supplement to the New Zealand Gazette, 26 March 2004, No. 35, page 767), as amended, are proposed for this substance, notwithstanding clause 1(1) of that schedule."

Secondary containment

9.11 The Committee notes that the specified default controls do not allow for dispensation where it is unnecessary for any associated pipework to have secondary containment.

9.12 Accordingly, the Committee has added the following subclauses after subclause (3) of regulation 36 of the Hazardous Substances (Emergency Management) Regulations 2001[1]:

(4) For the purposes of this regulation, and regulations 37 to 40, where this substance is contained in pipework that is installed and operated so as to manage any loss of containment in the pipework it—

(a) is not to be taken into account in determining whether a place is required to have a secondary containment system; and

(b) is not required to be located in a secondary containment system.

(5) In this clause, pipework—

(a) means piping that—

(i) is connected to a stationary container; and

(ii) is used to transfer a hazardous substance into or out of the stationary container; and

(b) includes a process pipeline or a transfer line.

Variation of controls under section 77

9.13 Under section 77(3), (4) and (5), the default controls determined by the hazardous properties of a substance may be varied.

Approved Handlers

9.14 The Committee considers that substances containing clopyralid should only be applied by approved handlers as they will be aware of the risks associated with the substances and manage their use of accordingly.

9.15 Thus, the Committee has varied the approved handler control under section 77(3)(a) so that regulation 9 of the Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001 applies to the substances as if subclauses (1) to (4) were omitted and the following substituted:

(1) The substance must be under the personal control of an approved handler when the substance is used in any quantity.

(2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008.

(3) For the period 20 Aug 2007 to 19 Aug 2008, the substance must be under the personal control of an approved handler when the substance is:

(a) applied in a wide dispersive manner;

(b) used by a commercial contractor.

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[1] These sub-clauses were applied to pesticides transferred to the Act as notified in the Hazardous Substances (Pesticides) Transfer Notice 2004, as amended.

(4) The substance may be handled by a person who is not an approved handler if –

(a) an approved handler is present at the place where the substance is being handled; and

(b) the approved handler has provided guidance to the person in respect of the handling; and

(c) the approved handler is available at all times to provide assistance, if necessary, to the person while the substance is being handled by the person.

Tracking

9.16 The Committee considers that substances containing clopyralid should only be sold to approved handlers. This requirement is expected to further raise awareness of the risks associated with the substances and decrease the likelihood of green waste contaminated with clopyralid entering the compost-making stream

9.17 Accordingly, the Committee has varied the tracking controls under section 77(4)(b) as follows:

The Hazardous Substances (Tracking Controls) Regulations 2001 apply to as if regulations 4 to 5 were omitted.

The regulations apply as if regulation 6 was omitted and the following substituted:

6 (1) The person in charge of a place where the substance is sold may sell the substance to a person only if he or she has received confirmation that the person holds a test certificate as an approved handler of the substance.

(2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008.

Setting of exposure limits

9.18 Control **E1** relates to the requirements to limit exposure of non-target organisms in the environment through the setting of Environmental Exposure Limits (EELs). Following the enactment of the Hazardous Substances and New Organisms (Approvals and Enforcement) Act 2005, the Authority is reviewing the setting of EELs under section 77B. As this review has not been completed, no EELs are set for substances containing clopyralid at this time and the default values are deleted.

9.19 Control **E2** relates to the requirement to set an application rate for a class 9 substance that is to be sprayed on an area of land (or air or water) and for which an EEL has been set. As no EEL has been set for substances containing clopyralid, the Committee is not able to set an application rate under this regulation at this time.

9.20 Control **T1** relates to the requirement to limit public exposure to toxic substances by the setting of Tolerable Exposure Limits (TELs), which are derived from Acceptable Daily Exposure (ADE) values.

9.21 The Committee adopts the Agency's proposal of **0.15 mg/kg bw/day** as the ADE for clopyralid.

9.22 Based on the ADE of 0.15 mg/kg bw/day the Committee sets the following PDEs:

PDE_{FOOD} = 0.105 mg/kg bw/day;
$PDE_{DRINKING\ WATER}$ = 0.03 mg/kg bw/day.

9.23 For further information, including calculations, on the setting of the ADE and PDEs refer to Appendix F of the E&R Report.

9.24 The Committee is not setting any TEL values for substances containing clopyralid, until implementation of a pending review of setting such values under section 77B

9.25 Control **T2** relates to the requirement to limit worker exposure to toxic substances by the setting of Workplace Exposure Standards (WESs). No workplace exposure standards have been set for clopyralid. Workplace exposure standards may have been set for components of substances containing clopyralid. Refer: "Workplace Exposure Standards", published by the Occupational Safety and Health Service, Department of Labour, January 2002, ISBN 0-477-03660-0. Also available at www.osh.govt.nz/order/catalogue/pdf/wes2002.pdf

10 Monitoring of effectiveness of controls

10.1 The Committee acknowledges that there is some uncertainty regarding the effectiveness of the controls in preventing contamination of compost manufactured from grass clippings. Accordingly, the Committee considers that ERMA New Zealand should monitor the reporting of contamination by the applicant over the next 5 years. The Committee notes that at the end of this time, if there is evidence of significant adverse effects, the Authority may consider whether there are any further grounds for reassessing substances containing clopyralid under the Act.

10.2 The Committee also recommends that the composting industry should take steps to improve compliance with *New Zealand Standard 4454, Compost Soil Conditioners and Mulches*.

11 Environmental user charges

11.1 The Committee considers that the application of controls to substances containing clopyralid will provide an effective means of managing risks associated with this substance. At this time no consideration has been given to whether or not environmental charges should be applied to this substance as an alternative or additional means of achieving effective risk management

12 Decision

12.1 The Committee determines that, pursuant to section 29 and clause 26:

- the positive effects of substances containing clopyralid for the agriculture, forestry, amenity and turf sectors outweigh the adverse effects.

12.2 The Committee determines that, pursuant to section 29 and clause 27:

- the adverse effects of substances containing clopyralid on the domestic market outweigh the positive effects.

12.3 Accordingly, the Committee:

- approves the manufacture and importation of the substances listed in Table 12.1 subject to the controls as listed in Appendix 2;

Table 12.1 Approved substances containing clopyralid.

Substance name	HSNO approval number
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance A)	HSR000760
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance B)	HSR000761
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine (MEA) salts	HSR000762
Clout	HSR007682

- modifies the classifications of the substances as shown in Table 12.2;

Table 12.2 Classification of substances containing clopyralid.

Substance description and approval number	Hazard classification
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance A) HSNO Approval Number: HSR000760	9.1B, 9.2A, 9.3C
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance B) HSNO Approval Number: HSR000761	9.1B, 9.2A, 9.3C
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine salts HSNO Approval Number: HSR000762	6.4A 9.1C, 9.2A, 9.3C
Clout (contains 478.8 g/litre terbuthylazine and 12.75 clopyralid) HSNO Approval Number: HSR007682	6.1E, 6.4A, 6.5B, 9.1A, 9.2A

- revokes the approval for the importation or manufacture of *Soluble concentrate containing 30 g/litre clopyralid* (HSNO approval no. HSR000759). This revocation takes effect on 19 August 2008.

12.4 In accordance with clause 36(2)(b), the Committee records that, in reaching these conclusions, it has applied the balancing tests in section 29 and clauses 26 and 27.

12.5 It has also applied the following criteria in the Methodology:

- clause 9 – equivalent of sections 5, 6 and 8;
- clause 11 – characteristics of substance;
- clause 12 – evaluation of assessment of risks;
- clause 13 – evaluation of assessment of costs and benefits;
- clause 14 – costs and benefits accruing to New Zealand;
- clause 21 – the decision accords with the requirements and regulations;
- clause 22 – the evaluation of risks, costs and benefits – relevant considerations;
- clause 24 – the use of recognised risk identification, assessment, evaluation and management techniques;
- clause 25 – the evaluation of risks;
- clause 33 – risk characteristics;
- clause 34 – the aggregation and comparison of risks, costs and benefits;
- clause 35 – the costs and benefits of varying the default controls.

Dr Max Suckling Date: 17 August 2007
Chair

ERMA New Zealand Approval Codes:

Substance name	**HSNO approval number**
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance A)	HSR000760
Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substance B)	HSR000761
Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine (MEA) salts	HSR000762
Clout	HSR007682

Appendix 1: Qualitative descriptors for risk/benefit assessment

Assessing risks, costs and benefits qualitatively

This section describes how the Agency staff and the Authority address the qualitative assessment of risks, costs and benefits.

Risks and benefits are assessed by estimating the magnitude and nature of the possible effects and the likelihood of their occurrence. For each effect, the combination of these two components determines the level of the risk associated with that effect, which is a two dimensional concept.

Because of a lack of data, risks are often presented as singular results. In reality, they are better represented by 'families' of data which link probability with different levels of outcome (magnitude).

Describing the magnitude of effect

The magnitude of effect is described in terms of the element that might be affected. The qualitative descriptors for magnitude of effect are surrogate measures that should be used to gauge the end effect or the 'what if' element.

Tables A1.1 and A1.2 contain generic descriptors for magnitude of adverse and beneficial effect. These descriptors are examples only, and their generic nature means that it may be difficult to use them in some particular circumstances. They are included here to illustrate how qualitative tables may be used to represent levels of adverse and beneficial effect.

The sample qualitative descriptors for effects on the market economy listed in the ERMA New Zealand technical guide to decision making[2] include representative numbers. These 'economic' descriptors were developed prior to the publication of the technical guide on identification and assessment of effects on the market economy,[3] which refines the approach that ERMA New Zealand applies to identifying and assessing economic effects. These numbers do not align well with the qualitative descriptors in the other categories (effects on the environment, effects on human health, and effects on society and communities), as they relate more to an event than an effect. In particular the numbers are unclear about how they take account of time (are they annual, or over the life of the activity) and they do not have a local, regional or national context.

ERMA New Zealand has adopted a revised set of qualitative descriptors for the magnitude of effect on the market economy, as shown below.

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2 ERMA New Zealand. 2004. *Decision Making: A Technical Guide to Identifying, Assessing and Evaluating Risks, Costs and Benefits,* ER-TG-05-01. Wellington: Environmental Risk Management Authority.

3 ERMA New Zealand. 2005. *Assessment of Economic Risks, Costs and Benefits: Consideration of Impacts on the Market Economy,* ER-TG-06-01. Wellington: Environmental Risk Management Authority.

Table A1.1: Magnitude of adverse effect (risks and costs)

Descriptor	Examples of descriptions: ADVERSE
Minimal	Mild reversible short term adverse health effects to individuals in highly localised area Highly localised and contained environmental impact, affecting a few (less than ten) individuals members of communities of flora or fauna, no discernible ecosystem impact Local/regional short-term adverse economic effects on small organisations (businesses, individuals), temporary job losses No social disruption
Minor	Mild reversible short term adverse health effects to identified and isolated groups Localised and contained reversible environmental impact, some local plant or animal communities temporarily damaged, no discernible ecosystem impact or species damage Regional adverse economic effects on small organisations (businesses, individuals) lasting less than six months, temporary job losses Potential social disruption (community placed on alert)
Moderate	Minor irreversible health effects to individuals and/or reversible medium term adverse health effects to larger (but surrounding) community (requiring hospitalisation) Measurable long term damage to local plant and animal communities, but no obvious spread beyond defined boundaries, medium term individual ecosystem damage, no species damage Medium term (one to five years) regional adverse economic effects with some national implications, medium term job losses Some social disruption (e.g. people delayed)
Major	Significant irreversible adverse health effects affecting individuals and requiring hospitalisation and/or reversible adverse health effects reaching beyond the immediate community Long term/irreversible damage to localised ecosystem but no species loss Measurable adverse effect on GDP, some long term (more than five years) job losses Social disruption to surrounding community, including some evacuations
Massive	Significant irreversible adverse health effects reaching beyond the immediate community and/or deaths Extensive irreversible ecosystem damage, including species loss Significant on-going adverse effect on GDP, long term job losses on a national basis Major social disruption with entire surrounding area evacuated and impacts on wider community

Table A1.2: Magnitude of beneficial effect (benefits).

Descriptor	Examples of descriptions: BENEFICIAL
Minimal	Mild short term positive health effects to individuals in highly localised area Highly localised and contained environmental impact, affecting a few (less than ten) individuals members of communities of flora or fauna, no discernible ecosystem impact Local/regional short-term beneficial economic effects on small organisations (businesses, individuals), temporary job creation No social effect
Minor	Mild short term beneficial health effects to identified and isolated groups Localised and contained beneficial environmental impact, no discernible ecosystem impact Regional beneficial economic effects on small organisations (businesses, individuals) lasting less than six months, temporary job creation Minor localised community benefit
Moderate	Minor health benefits to individuals and/or medium term health impacts on larger (but surrounding) community and health status groups Measurable benefit to localised plant and animal communities expected to pertain to medium term. Medium term (one to five years) regional beneficial economic effects with some national implications, medium term job creation Local community and some individuals beyond immediate community receive social benefit.
Major	Significant beneficial health effects to localised community and specific groups in wider community Long term benefit to localised ecosystem(s) Measurable beneficial effect on GDP, some long term (more than five years) job creation Substantial social benefit to surrounding community, and individuals in wider community.
Massive	Significant long term beneficial health effects to the wider community Long term, wide spread benefits to species and/or ecosystems Significant on-going effect beneficial on GDP, long term job creation on a national basis Major social benefit affecting wider community

Determining the likelihood of the end effect

Likelihood in this context applies to the composite likelihood of the end effect, and not either to the initiating event, or any one of the intermediary events. It includes:

- the concept of an initiating event (triggering the hazard); and
- the exposure pathway that links the source (hazard) and the area of impact (public health, environment, economy, or community).

Thus, the likelihood is the likelihood of the specified adverse effect[4] resulting from that initiating event. It will be a combination of the likelihood of the initiating event and several intermediary likelihoods[5]. The best way to determine the likelihood is to specify and analyse the complete pathway from source to impact.

Likelihood may be expressed as a frequency or a probability. While frequency is often expressed as a number of events within a given time period, it may also be expressed as the number of events per head of (exposed) population. As a probability, the likelihood is dimensionless and refers to the number of events of interest divided by the total number of events (range 0–1). (See Table A1.3.)

Table A1.3: Likelihood.

	Descriptor	Description
1	Highly improbable	Almost certainly not occurring but cannot be totally ruled out
2	Improbable (remote)	Only occurring in very exceptional circumstances.
3	Very unlikely	Considered only to occur in very unusual circumstances
4	Unlikely (occasional)	Could occur, but is not expected to occur under normal operating conditions.
5	Likely	A good chance that it may occur under normal operating conditions.
6	Very likely	Expected to occur if all conditions met
7	Extremely likely	Almost certain

4 The specified effect refers to scenarios established in order to establish the representative risk, and may be as specific as x people suffering adverse health effects, or y% of a bird population being adversely affected. The risks included in the analysis may be those related to a single scenario, or may be defined as a combination of several scenarios.

5 Qualitative event tree analysis may be a useful way of ensuring that all aspects are included.

Using magnitude and likelihood to construct risk/ benefit

Using the magnitude and likelihood tables a matrix representing a level of risk or benefit can be constructed (Table A1.4).

Table A1.4: Level of risk/benefit

Likelihood	Magnitude of effect				
	Minimal	Minor	Moderate	Major	Massive
Highly improbable	A	A	B	C	D
Improbable	A	B	C	D	E
Very unlikely	B	C	D	E	E
Unlikely	C	D	E	E	F
Likely	D	E	E	F	F
Very likely	E	E	F	F	F
Extremely likely	E	F	F	F	F

The Agency considers that, for these substances, the level of risk/benefit can be assigned as follows in Table A1.5.

Table A1.5: Assignment of level of risk/benefit.

A & B	**Negligible**
C	**Low**
D	**Medium**
E	**High**
F	**Extreme**

Appendix 2: Controls applying to substances containing clopyralid

The controls imposed on substances containing clopyralid are contained in the following tables. The regulations cited should be referred to for definitions and exemptions. The ERMA New Zealand publication *User Guide to Control Regulations* provides useful guidance on the controls.

Table A2.1 Controls on Soluble concentrates containing 30 g/litre clopyralid

The approval to manufacture or import soluble concentrates containing 30 g/litre clopyralid is revoked as of 19 August 2008.

Table A2.2: Controls for Soluble concentrate containing 300 g/litre clopyralid as the amine salt (Substances A and B)

Control Codes[1]	Regulation[2]	Topic	Variations
Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001			
E1	Regs 32–45	Limiting exposure to ecotoxic substances.	No environmental exposure limits have been set for these substances at this time and the default EELs given under Regulation 32 have been deleted.
E2	Regs 46–48	Restrictions on use within application area.	A maximum application rate has not been set.
E5	Regs 5(2), 6	Requirements for keeping records of use.	
E6	Reg 7	Requirements for equipment used to handle substances.	
E7	Reg 9	Approved handler requirements.	Regulation 9(1) applies as if subclauses (1) to (4) were omitted and the following substituted: (1) The substance must be under the personal control of an approved handler when the substance is used in any quantity. (2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008. (3) For the period 20 Aug 2007 to 19 Aug 2008, the substance must be under the personal control of an approved handler when the substance is: (a) applied in a wide dispersive manner; (b) used by a commercial contractor. (4) The substance may be handled by a person who is not an approved handler if – (a) an approved handler is present at the place where the substance is being handled; and (b) the approved handler has provided guidance to the person in respect of the handling; and (c) the approved handler is available at all times to provide assistance, if necessary, to

Control Codes[1]	Regulation[2]	Topic	Variations
			the person while the substance is being handled by the person.
Hazardous Substances (Identification) Regulations 2001			
I1	Regs 6, 7, 32–35, 36(1)–(7)	General identification requirements.	
I3	Reg 9	Priority identifiers for ecotoxic substances	The priority identifiers shall include the statement: *"Ecotoxic herbicide. Not for use in home gardens."* This labelling requirement does not come into effect when existing label stocks have been exhausted or 19 August 2009, whichever comes earliest.
I9	Reg 18	Secondary identifiers for all hazardous substances.	
I11	Reg 20	Secondary identifiers for ecotoxic substances.	The secondary identifiers shall include the statement: *" Do not use for treating turf that will be mown and the clippings used for making compost; or made available for collection for, or deposited at, a municipal green waste recycling depot."* This labelling requirement does not come into effect when existing label stocks have been exhausted or 19 August 2009, whichever comes earliest.
I19	Regs 29–31	Additional information requirements, including situations where substances are in multiple packaging.	
I21	Regs 37-39, 47-50	Documentation required in places of work.	
I23	Reg 41	Specific documentation requirements for ecotoxic substances.	The documentation shall include the following precautionary information: *"Ecotoxic herbicide. Do not use for treating turf that will be mown and the clippings used for making compost; or made available for collection for, or deposited at, a municipal green waste recycling depot."* This documentation requirement does not come into effect when existing documentation stocks have been exhausted or 19 August 2009, whichever comes earliest.
I29	Regs 51, 52	Duties of persons in charge of places in respect of signage.	
Hazardous Substances (Packaging) Regulations 2001			
P1	Regs 5, 6, 7(1), 8	General packaging requirements.	
P3	Reg 9	Requirement for substances packed in limited quantities.	
P15	Reg 21	Packaging requirements for ecotoxic substances.	
PG3	Schedule 3	Packaging requirements equivalent to	

Control Codes[1]	Regulation[2]	Topic	Variations
		UN Packing Group III.	
PS4	Schedule 4	Packaging requirements for substances packaged in limited quantities.	
Hazardous Substances (Disposal) Regulations 2001			
D5	Regs 8 and 9	Disposal requirements of toxic and ecotoxic substances.	
D6	Reg 10	Disposal requirements for packages.	
D7	Regs 11, 12	Information requirements.	
D8	Regs 13, 14	Disposal documentation requirements.	
Hazardous Substances (Emergency Management) Regulations 2001			
EM1	Regs 6, 7, 9–11	Level 1 emergency management information: General requirements.	
EM7	Reg 8(f)	Additional information requirements for ecotoxic substances.	
EM8	Regs 12-16, 18-20	Level 2 emergency management information requirements.	
EM11	Regs 25–34	Level 3 emergency management requirements – emergency response plans.	
EM12	Regs 35–41	Level 3 emergency management requirements – secondary containment.	The following subclauses are added after subclause (3) of regulation 36: (4) For the purposes of this regulation, and regulations 37 to 40, where this substance is contained in pipework that is installed and operated so as to manage any loss of containment in the pipework it— (a) is not to be taken into account in determining whether a place is required to have a secondary containment system; and (b) is not required to be located in a secondary containment system. (5) In this clause, pipework— (a) means piping that— (i) is connected to a stationary container; and (ii) is used to transfer a hazardous substance into or out of the stationary container; and (b) includes a process pipeline or a transfer line.
EM13	Reg 42	Level 3 emergency management requirements – signage.	
Hazardous Substances and New Organisms (Personnel Qualification) Regulations 2001			
AH1	Regs 4–6	Approved handler requirements (including test certificate and qualification requirements).	
Hazardous Substances (Tracking) Regulations 2001			
TR1	Regs 4(1), 5, 6	Tracking requirements.	These regulations apply to as if regulations 4 to 5 were omitted.

Control Codes[1]	Regulation[2]	Topic	Variations
			The regulations apply as if regulation 6 were omitted and the following substituted: 6 (1) The person in charge of a place where the substance is sold may sell the substance to a person only if he or she has received confirmation that the person holds a test certificate as an approved handler of the substance. (2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008.

Additional controls set under s77A	
Application	The substances will not be applied into or onto water.
Stationary container systems	The controls relating to stationary container systems, as set out in Schedule 8 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004 (Supplement to the *New Zealand Gazette*, 26 March 2004, No. 35, page 767), as amended, shall apply to these substances, notwithstanding clause 1(1) of that schedule.
Emergency management	Addition of subclauses after subclause (3) of Regulation 36 of the Hazardous Substances (Emergency Management Controls) Regulations, 2001 (see control EM12).

Table A2.3: Controls for Soluble concentrate containing 225 g/litre clopyralid and 150 g/litre picloram as the monoethanolamine salts

Control Codes[1]	Regulation[2]	Topic	Variations
Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001			
T1	Regs 11–27	Limiting exposure to toxic substances.	No TELs have been set for clopyralid.
T2	Regs 29, 30	Controlling exposure in places of work.	No workplace exposure standards have been set for clopyralid. Workplace exposure standards may have been set for components of substances containing clopyralid. Refer: "Workplace Exposure Standards", published by the Occupational Safety and Health Service, Department of Labour, January 2002, ISBN 0-477-03660-0. Also available at www.osh.govt.nz/order/catalogue/pdf/wes2002.pdf
T4/E6	Reg 7	Requirements for equipment used to handle substances.	
T5	Reg 8	Requirements for protective clothing and equipment.	
T7	Reg 10	Restrictions on the carriage of toxic substances on passenger service vehicles.	
E1	Regs 32–45	Limiting exposure to ecotoxic substances.	No environmental exposure limits have been set for this substance at this time and the default EELs given under Regulation 32 have been deleted.
E2	Regs 46–48	Restrictions on use within application area.	No maximum application rate has bee set.
E5	Regs 5(2), 6	Requirements for keeping records of use.	
E7	Reg 9	Approved handler requirements.	Regulation 9(1) applies as if subclauses (1) to (4) were omitted and the following substituted: (1) The substance must be under the personal control of an approved handler when the substance is used in any quantity. (2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008. (3) For the period 20 Aug 2007 to 19 Aug 2008, the substance must be under the personal control of an approved handler when the substance is: (a) applied in a wide dispersive manner; (b) used by a commercial contractor. (4) The substance may be handled by a person who is not an approved handler if – (a) an approved handler is present at the place where the substance is being handled; and (b) the approved handler has provided guidance to the person in respect of the handling; and

Control Codes[1]	Regulation [2]	Topic	Variations
			(c) the approved handler is available at all times to provide assistance, if necessary, to the person while the substance is being handled by the person.
Hazardous Substances (Identification) Regulations 2001			
I1	Regs 6, 7, 32–35, 36(1)–(7)	General identification requirements.	
I3	Reg 9	Priority identifiers for ecotoxic substances.	The priority identifiers shall include the statement: *"Not to be used on turf."* This labelling requirement does not come into effect when existing label stocks have been exhausted or 19 August 2009, whichever comes earliest.
I9	Reg 18	Secondary identifiers for all hazardous substance.	
I11	Reg 20	Secondary identifiers for ecotoxic substances.	The secondary identifiers shall include the statement: *"Treated vegetation shall not be disposed of at any green waste recycling centre*." This labelling requirement does not come into effect when existing label stocks have been exhausted or 19 August 2009, whichever comes earliest.
I16	Reg 25	Secondary identifiers for toxic substances.	
I17	Reg 26	Use of generic names.	
I18	Reg 27	Use of concentration ranges.	
I19	Regs 29–31	Additional information requirements, including situations where substances are in multiple packaging.	
I21	Regs 37-39, 47-50	Documentation required in places of work.	
I23	Reg 41	Specific documentation requirements for ecotoxic substances.	The documentation shall include the following precautionary information: *"The substance is not to be used on turf."* And that *"Treated vegetation shall not be disposed of at any green waste recycling centre."* This documentation requirement does not come into effect when existing documentation stocks have been exhausted or 19 August 2009, whichever comes earliest.
I28	Reg 46	Specific documentation requirements for toxic substances.	
I29	Regs 51, 52	Duties of persons in charge of places in respect of signage.	
Hazardous Substances (Packaging) Regulations 2001			
P1	Regs 5, 6,	General packaging requirements.	

Control Codes[1]	Regulation[2]	Topic	Variations
	7(1), 8		
P3	Reg 9	Requirement for substances packed in limited quantities.	
P13	Reg 19	Packaging requirements for toxic substances.	
PS4	Schedule 4	Packaging requirements for substances packaged in limited quantities [see Regulation 9].	
Hazardous Substances (Disposal) Regulations 2001			
D4/D5	Regs 8 and 9	Disposal requirements of toxic and ecotoxic substances.	
D6	Reg 10	Disposal requirements for packages.	
D7	Regs 11, 12	Information requirements.	
D8	Regs 13, 14	Disposal documentation requirements.	
Hazardous Substances (Emergency Management) Regulations 2001			
EM1	Regs 6, 7, 9–11	Level 1 emergency management information: general requirements.	
EM6	Reg 8(e)	Additional information requirements for toxic substances.	
EM7	Reg 8(f)	Additional information requirements for ecotoxic substances.	
EM8	Regs 12-16, 18-20	Level 2 emergency management information requirements.	
EM11	Regs 25–34	Level 3 emergency management requirements – emergency response plans.	
EM12	Regs 35–41	Level 3 emergency management requirements – secondary containment.	The following subclauses are added after subclause (3) of regulation 36: (4) For the purposes of this regulation, and regulations 37 to 40, where this substance is contained in pipework that is installed and operated so as to manage any loss of containment in the pipework it— (a) is not to be taken into account in determining whether a place is required to have a secondary containment system; and (b) is not required to be located in a secondary containment system. (5) In this clause, pipework— (a) means piping that— (i) is connected to a stationary container; and (ii) is used to transfer a hazardous substance into or out of the stationary container; and (b) includes a process pipeline or a transfer line.
EM13	Reg 42	Level 3 emergency management requirements – signage.	

Control Codes[1]	Regulation[2]	Topic	Variations
Hazardous Substances and New Organisms (Personnel Qualification) Regulations 2001			
AH1	Regs 4–6	Approved handler requirements (including test certificate and qualification requirements).	
Hazardous Substances (Tracking) Regulations 2001			
TR1	Regs 4(1), 5, 6	Tracking requirements.	These regulations apply to as if regulations 4 to 5 were omitted. The regulations apply as if regulation 6 were omitted and the following substituted: 6 (1) The person in charge of a place where the substance is sold may sell the substance to a person only if he or she has received confirmation that the person holds a test certificate as an approved handler of the substance. (2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008.

Additional controls set under s77A	
Application	The substances will not be applied into or onto water.
Stationary container systems	The controls relating to stationary container systems, as set out in Schedule 8 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004 (Supplement to the *New Zealand Gazette*, 26 March 2004, No. 35, page 767), as amended, shall apply to these substances, notwithstanding clause 1(1) of that schedule.
Emergency management	Addition of subclauses after subclause (3) of Regulation 36 of the Hazardous Substances (Emergency Management Controls) Regulations, 2001 (see control EM12).

Table A2.4: Controls for Clout (contains 478.8 g/litre terbuthylazine and 12.75 clopyralid)

Control Codes[1]	Regulation[2]	Topic	Variations
Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001			
T1	Regs 11–27	Limiting exposure to toxic substances.	No TELs have been set for clopyralid.
T2	Regs 29, 30	Controlling exposure in places of work.	No workplace exposure standards have been set for clopyralid. Workplace exposure standards may have been set for components of substances containing clopyralid. Refer: "Workplace Exposure Standards", published by the Occupational Safety and Health Service, Department of Labour, January 2002, ISBN 0-477-03660-0. Also available at www.osh.govt.nz/order/catalogue/pdf/wes2002.pdf
T4/E6	Reg 7	Requirements for equipment used to handle substances.	
T5	Reg 8	Requirements for protective clothing and equipment.	
T7	Reg 10	Restrictions on the carriage of toxic substances on passenger service vehicles.	
E1	Regs 32–45	Limiting exposure to ecotoxic substances.	No environmental exposure limits have been set for these substances at this time and the default EELs given under Regulation 32 have been deleted.
E2	Regs 46–48	Restrictions on use within application area.	Maximum application rate for Clout Set at 30 l/ha.
E5	Regs 5(2), 6	Requirements for keeping records of use.	
E7	Reg 9	Approved handler requirements.	Regulation 9(1) applies as if subclauses (1) to (4) were omitted and the following substituted: (1) The substance must be under the personal control of an approved handler when the substance is used in any quantity. (2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008. (3) For the period 20 Aug 2007 to 19 Aug 2008, the substance must be under the personal control of an approved handler when the substance is: (a) applied in a wide dispersive manner; (b) used by a commercial contractor. (4) The substance may be handled by a person who is not an approved handler if – (a) an approved handler is present at the place where the substance is being handled; and (b) the approved handler has provided guidance to the person in respect of the handling; and (c) the approved handler is available at all times to provide assistance, if necessary, to the person while the substance is being handled by the person.
Hazardous Substances (Identification) Regulations 2001			
I1	Regs 6, 7,	General identification requirements.	

Control Codes[1]	Regulation[2]	Topic	Variations
	32–35, 36(1)–(7)		
I3	Reg 9	Priority identifiers for ecotoxic substances.	The priority identifiers shall include the statement: *"Not to be used on turf."* This labelling requirement does not come into effect when existing label stocks have been exhausted or 19 August 2009, whichever comes earliest.
I8	14	Priority identifiers for certain toxic substances.	
I9	Reg 18	Secondary identifiers for all hazardous substances.	
I11	Reg 20	Secondary identifiers for ecotoxic substances.	The secondary identifiers shall include the statement: *"Treated vegetation shall not be disposed of at any green waste recycling centre."* This labelling requirement does not come into effect when existing label stocks have been exhausted or 19 August 2009, whichever comes earliest.
I16	Reg 25	Secondary identifiers for toxic substances.	
I17	Reg 26	Use of generic names.	
I18	Reg 27	Use of concentration ranges.	
I19	Regs 29–31	Additional information requirements, including situations where substances are in multiple packaging.	
I21	Regs 37-39, 47-50	Documentation required in places of work.	
I23	Reg 41	Specific documentation requirements for ecotoxic substances.	The documentation shall include the following precautionary information: *"The substance is not to be used on turf."* And that *"Treated vegetation shall not be disposed of at any green waste recycling centre."* This documentation requirement does not come into effect when existing documentation stocks have been exhausted or 19 August 2009, whichever comes earliest.
I28	Reg 46	Specific documentation requirements for toxic substances.	
I29	Regs 51, 52	Duties of persons in charge of places in respect of signage.	
I30	Reg 53	Advertising corrosive and toxic substances.	
Hazardous Substances (Packaging) Regulations 2001			
P1	Regs 5, 6, 7(1), 8	General packaging requirements.	
P3	Reg 9	Requirement for substances packed in limited quantities.	
P13*	Reg 19	Packaging requirements for toxic substances	
P15	Reg 21	Packaging requirements for ecotoxic substances.	
PG3	Schedule 3	Packaging requirements equivalent to	

Control Codes[1]	Regulation[2]	Topic	Variations
		UN Packing Group III.	
PS4	Schedule 4	Packaging requirements for substances packaged in limited quantities [see Regulation 9].	
Hazardous Substances (Disposal) Regulations 2001			
D4/D5	Regs 8 and 9	Disposal requirements of toxic and ecotoxic substances.	
D6	Reg 10	Disposal requirements for packages.	
D7	Regs 11, 12	Information requirements.	
D8	Regs 13, 14	Disposal documentation requirements.	
Hazardous Substances (Emergency Management) Regulations 2001			
EM1	Regs 6, 7, 9–11	Level 1 emergency management information: General requirements.	
EM6	Reg 8(e)	Additional information requirements for toxic substances.	
EM7	Reg 8(f)	Additional information requirements for ecotoxic substances.	
EM8	Regs 12-16, 18-20	Level 2 emergency management information requirements.	
EM11	Regs 25–34	Level 3 emergency management requirements – emergency response plans.	
EM12	Regs 35–41	Level 3 emergency management requirements – secondary containment.	The following subclauses are added after subclause (3) of regulation 36: (4) For the purposes of this regulation, and regulations 37 to 40, where this substance is contained in pipework that is installed and operated so as to manage any loss of containment in the pipework it— (a) is not to be taken into account in determining whether a place is required to have a secondary containment system; and (b) is not required to be located in a secondary containment system. (5) In this clause, pipework— (a) means piping that— (i) is connected to a stationary container; and (ii) is used to transfer a hazardous substance into or out of the stationary container; and (b) includes a process pipeline or a transfer line.
EM13	Reg 42	Level 3 emergency management requirements – signage.	
Hazardous Substances and New Organisms (Personnel Qualification) Regulations 2001			
AH1	Regs 4–6	Approved handler requirements (including test certificate and qualification requirements).	
Hazardous Substances (Tracking) Regulations 2001			
TR1	Regs 4(1), 5,	Tracking Requirements.	These regulations apply to as if regulations 4 to 5

Control Codes[1]	Regulation[2]	Topic	Variations
	6		were omitted. The regulations apply as if regulation 6 were omitted and the following substituted: 6 (1) The person in charge of a place where the substance is sold may sell the substance to a person only if he or she has received confirmation that the person holds a test certificate as an approved handler of the substance. (2) Subclause (1) does not apply for the period 20 Aug 2007 to 19 Aug 2008.

Additional controls set under s77A	
Application	The substances will not be applied into or onto water.
Stationary container systems	The controls relating to stationary container systems, as set out in Schedule 8 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004 (Supplement to the *New Zealand Gazette*, 26 March 2004, No. 35, page 767), as amended, shall apply to these substances, notwithstanding clause 1(1) of that schedule.
Emergency management	Addition of subclauses after subclause (3) of Regulation 36 of the Hazardous Substances (Emergency Management Controls) Regulations, 2001 (see control EM12).