

Section 14: Hazardous Substances

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14. HAZARDOUS SUBSTANCES

14.1 Introduction

A range of substances used in business, industry and agriculture, are, by their nature, capable of causing damage to property, the environment or human health. These substances are usually referred to as hazardous substances.

The potential effect of a hazardous substance is related to such factors as:

- its hazardous characteristics, being whether it is toxic, ecotoxic explosive, flammable, corrosive or oxidising;
- the quantity and form in which it is used, stored, disposed and transported;
- the method of management in terms of how it is used, stored, disposed and transported;
- its siting in relation to other hazardous substances and environmentally sensitive areas, for example, residential areas and water bodies.

Various legislative requirements exist which deal with the safety aspects of hazardous substances used or stored on site or when they are transported and disposed¹ off-site. Relevant legislation which applies to hazardous substances includes:

- Hazardous Substances and New Organism Act 1996;
- the Building Act 1991;
- the Radiation Protection Act 1965 and Regulations;
- the Ozone Layer Protection Act 1996;
- the Health and Safety in Employment Act 1992;
- Animal Remedies Act 1967 and Regulations;
- the Land Transport Act 1993, and New Zealand Standard 5433:1988 — Code of Practice for the Transport of Hazardous Substances on Land.

Although the Hazardous Substances and New Organisms legislation is developing technical standards for the use, storage, inspection, identification and regulation of hazardous substances, responsibility still rests, under Sections 30 and 31 of the Resource Management Act, with Local Authorities to control the effects of the use or development of land to prevent or mitigate any adverse effects that may result from the use, storage, disposal or transportation of hazardous substances.

Within Palmerston North, the Manawatu-Wanganui Regional Council has assumed responsibility for managing the use of land to prevent or mitigate any adverse effects of the disposal of hazardous substances. Consistent with P 31.2(b) of the Regional Policy Statement, Palmerston North City Council is therefore responsible for controlling any actual or potential effects of the use, development or protection of land as affected by hazardous substances and for the prevention or mitigation of any adverse effects of the storage, use and transportation of hazardous substances.

¹ In the case of the disposal of hazardous substances/wastes, it is noted that the 'Basel Convention on Transboundary Movement of Hazardous Wastes' has required the setting up of a formal procedure for New Zealand to manage the import and export of hazardous wastes. For further information, contact the Ministry of Economic Development.

In order to manage the effects of hazardous substances, this Plan must focus on those facilities and activities which use or store hazardous substances, rather than the hazardous substances themselves.

The primary purpose of this section is to therefore control the location and management of hazardous facilities, being those activities or facilities involved in the use, storage, and transportation of hazardous substances, within the City and to minimise the risk to property, the environment and the health of the City's people, from those substances.

14.2 Resource Management Issues

The following resource management issues have been identified regarding the use, storage, and transportation of hazardous substances within the City:

1. The potential damage to property, the environment and the health of the City's residents which could arise from an accidental or unintentional release of hazardous substances.
2. The risk to property, the environment and the health of City's residents, where hazardous facilities are inappropriately located and managed.
3. Raising community awareness of the potential effects and risks associated with the use, storage, and transport of hazardous substances.

Explanation

The use, storage, and transportation of hazardous substances within the City raises several issues which require attention within this Plan.

The potential of damage to property, the environment and human health with the accidental or unintentional release of hazardous substances is identified as an issue given that this is a risk associated with permitting the use, storage, or transportation of hazardous substances. This issue must be addressed in assessing and developing the conditions under which hazardous facilities will be able to establish within the City. This is a significant issue when dealing with the development of hazardous facilities in business and industrial areas which adjoin sensitive residential areas.

There is also the issue of the risk to property, the environment and people where hazardous facilities are inappropriately sited within the City. Depending on the size, scale and type of hazardous facility, certain facilities in particular areas will pose risks to property, the environment or human health (i.e., a toxic chemical store in the residential area) that are inconsistent with the risks that are associated with other accepted activities in that area. This issue needs to be addressed in considering the appropriateness of sites on which hazardous facilities may establish.

Poor community and business operator awareness of the risks and potential effects associated with hazardous substances is also considered an issue, given that this can contribute to the likelihood of accidents, unsafe site management practices, potential site contamination, and inappropriate hazardous wastes disposal. This is an issue that needs to be addressed as part of the comprehensive management of hazardous substances within the City.

14.3 Objectives and Policies

Within the broad framework of the City View objectives in Section 2, the following specific objectives and policies have been identified:

Objective 1

To avoid, remedy or mitigate risks to property, the environment and the health of City residents where hazardous substances are used, stored or transported within the City.

Policies

- 1.1 To identify those facilities using or storing hazardous substances which pose a risk to property, the environment or human health.
- 1.2 To control the location of hazardous facilities within the City in order to avoid, remedy or mitigate unacceptable risks and prevent or mitigate any adverse effects associated with the use, storage or transportation of hazardous substances to people, property and the environment.
- 1.3 To ensure that hazardous facilities are designed, constructed and managed in such a manner so as to prevent or mitigate any adverse effects associated with the use, storage or transportation of hazardous substances including any unintentional or accidental release of hazardous substances.

Explanation

There are a range of facilities within the City which are involved in the use, storage or transportation of hazardous substances. As discussed above the potential for the accidental release of hazardous substances poses a "risk" to the community and environment.

By controlling the location of hazardous facilities and applying standards to the development of those facilities, the risks associated with the use, storage and transportation of hazardous substances can be reduced. Within Palmerston North this will involve discouraging hazardous facilities from establishing near sensitive residential areas. Further, standards relating to the development of hazardous facilities will also be used to reduce or mitigate any adverse effects associated with accidents or releases of hazardous substances, thereby reducing the risks to adjacent properties or any sensitive environmental areas.

14.4 Methods

- Rules
- Implementation and review of By-laws to control discharges to stormwater and sewerage utility systems
- Public Education (e.g. Environmental awareness and enhancement programmes)
- Discharging the Council's obligations under current Dangerous Goods and Hazardous Substances and New Organisms legislation and its subsequent amendments
- Promoting industry and business use, development and implementation of Codes of Practice for the use, storage and transportation of hazardous substances

While some aspects of the objectives and policies of this section will be achieved through the provision of this Plan, the full realisation of those objectives and policies will only come through the combined efforts of a number of other methods. The existence of by-laws and other legislation dealing with hazardous substances means that the objectives and policies will only be effectively achieved if all the methods are used simultaneously. However given the environmental damage which could be suffered from uncontrolled use, storage, disposal or transport of hazardous substances, the compliance costs associated with these methods are quite reasonable and justifiable in the circumstance. Public education will also be an important and cost-effective means of ensuring that hazardous substances are correctly used, stored, disposed and transported. Additionally recognising industry groups codes of practice, which are aimed at quality site management and risk minimisation, and encouraging industry to adopt such practices will also provide a cost effective means of ensuring that hazardous substances are appropriately used, stored, disposed or transported.

Note: Council's specific management responsibilities for hazardous substances are outlined in Section 14.1.

14.5 Environmental Results Anticipated

It is anticipated that the objectives, policies and methods of this section will achieve the following results:

1. Minimised risk to people, property and the environment associated with the location and development of hazardous facilities within the city.
2. Minimised risk to people, property and the environment associated with the accidental or unintentional release of hazardous substances.
3. Increased community and business awareness of the risks and adverse environmental effects associated with the use, storage, disposal and transportation of hazardous substances within the city.
4. Avoidance of the contamination of the natural environment by hazardous substances.

14.6 The Hazardous Facility Screening Procedure (HFSP)

The Hazardous Facility Screening Procedure (HFSP) is a tool that has been developed to assist in the management of hazardous facilities. It is designed to screen all new hazardous facilities wishing to establish within the City. Dependant on the zone in which the intended facility wishes to establish, the HFSP will determine the activity status and degree of scrutiny that the facility should be subject to in terms of it's potential risk to property, the environment and human health.

The screening assessment of a facility focuses on the potential effects of hazardous substances used or stored by the facility. These effects can be broadly categorised into three groups:

- effects caused by fire/explosion;
- effects on human health;
- effects on the environment.

The level of risk identified for these effects groups is then used to determine whether a facility is a Permitted Activity in a particular zone, or whether it is a Discretionary Activity for which a resource consent is required.

Existing hazardous facilities are not subject to the HFSP where Section 10 or 10A of the Resource Management Act 1991 apply.

The HFSP set out in Appendix 14.A provides for the calculation of *Effects Ratios* which are used to determine the consent status for hazardous facilities. Appendix 14.B contains further information on the Hazardous Facilities Screening Procedure.

A definition of 'Hazardous Facility' is contained within Section 4 - Definitions of the Plan.

14.7 Rules: Permitted Activities**R 14.7.1 Permitted Activities****Hazardous Facilities which:**

- (i) are equal to or below the effects ratio for Permitted Activities identified in Appendix 14A; and
 - (ii) are not specified as Controlled or Discretionary (Restricted or Unrestricted) Activities; and
 - (iii) comply with the following performance conditions,
- are Permitted Activities.

Performance Conditions

The following Performance Conditions shall apply to the management of solid and liquid (excluding liquefied gases) hazardous substances within a hazardous facility:

- (a) **The site or part(s) of the site involved in the manufacturing, mixing, packaging, storing, loading, unloading, using or handling of hazardous substances shall be serviced by a spill containment system. The spill containment system shall be:**
 - (i) constructed from impervious materials that are resistant to the hazardous substances involved;
 - (ii) able to contain the maximum volume of the largest tank used. Where drums or other containers are used the spill containment system shall be able to contain half of the maximum volume of substances stored;
 - (iii) Designed, constructed and managed so that it is:
 - (a) able to prevent any spill or other unintentional release of hazardous substances, and any stormwater and/or firewater that has become contaminated, from entering the stormwater drainage system;
 - (b) able to prevent any spill or other unintentional release of hazardous substances, and any stormwater and/or firewater that has become contaminated, from discharging into or onto land and/or water (including groundwater and potable water supplies) unless permitted by a resource consent.
- (b) **Unless permitted by resource consent, underground tanks (being the primary containment vessel) shall be:**
 - (i) constructed of impervious materials that are resistant to the hazardous substance(s) which are used or stored;
 - (ii) protected by a secondary containment vessel which is:
 - (a) constructed of impervious materials which are resistant to the hazardous substances used or stored within the primary containment vessel; and
 - (b) able to contain any leakage from the primary containment vessel;

- (iii) serviced by a leak detection system which is:
 - (a) capable of detecting a failure or breach in the structural integrity of the primary containment vessel;
 - (b) backed up by a monitoring programme;
- (iv) repaired or replaced, consistent with Rule 14.7.1(b)(i)-(iii), where there is a failure or breach in either the primary or secondary containment vessel.
- (c) **That part of a hazardous facility site where vehicles, equipment or containers that are or may have become contaminated with hazardous substances are washed, shall be designed, constructed and managed to prevent the effluent from the wash down area from:**
 - (i) entry or discharge into the stormwater drainage system;
 - (ii) discharge into or onto land and/or water (including groundwater and potable water supplies) unless permitted by a resource consent.

NOTE TO PLAN USERS

In situations where an activity cannot or does not comply with the requirements of this performance condition, an application to the Manawatu-Wanganui Regional Council is necessary for a discharge of a contaminant into or onto land (or water).

Explanation

Hazardous substances spillage can occur through accidental, unintentional or deliberate discharges of such substances. Such discharges are largely the product of poor site management systems or site design. These rules are intended to reduce the likelihood and risks of such spills.

Where petroleum products are subject to rule (b), the code of practice for "Design, Installation and Operation of Underground Petroleum systems", by the Department of Labour, OSH, can be used to comply with the requirements of Rule 14.7.1(b)



R 14.7.2 Hazardous Substances used by Temporary Military Training Activities in the Flood Protection Zone or Rural Zones

The use, storage or transportation of hazardous substances by any Temporary Military Training Activity within the Flood Protection Zone or Rural Zone shall be exempt from the Hazardous Facility Screening Procedure (HFSP) and is a Permitted Activity, subject to compliance with the following performance conditions:

Performance Conditions

- (a) **The use, storage or transportation of hazardous substances shall be restricted to no more than:**
 - (i) 25 jerry cans (450 litres) of petrol (not including fuel in motor vehicle fuel tanks); and
 - (ii) 25 jerry cans (450 litres) of diesel (not including fuel in motor vehicle fuel tanks); and
 - (iii) 60 kg of UN Class 1.1 Explosives; and
 - (iv) 10 kg of UN Class 1.2 Explosives; and

- (v) 20 kg of UN Class 1.3 Explosives
- (b) **The storage, loading, unloading, use, handling and transportation of hazardous substance shall be conducted in a manner that prevents any spill or unintentional release of hazardous substances, and any stormwater and/or firewater that may have become contaminated, from entering the stormwater drainage system or discharging into or onto land and/or water unless permitted by a resource consent.**
- (c) **The use, storage or transportation of hazardous substances shall comply with performance condition (c) within Rule 14.7.1.**

14.8 Rules: Controlled Activities



R 14.8.1 The use, storage and transportation of hazardous substances by service stations

The use, storage and transportation of hazardous substances by Services Stations is exempt from the HFSP and is a Controlled Activity in respect of:

- the design, installation and operation of underground petroleum storage facilities;
- LPG gas storage and handling;
- implementation of spill and stormwater control systems;
- spill contingency and emergency planning, monitoring and maintenance schedules.

subject to compliance with the following Performance Conditions:

Performance Conditions

- (a) **The storage of petrol, diesel and LPG shall be restricted to no more than:**
- (i) 100 000 litres of petrol in underground tanks; and
 - (ii) 50 000 litres of diesel in underground tanks; and
 - (iii) 6 tonnes, single vessel storage, of LPG gas.
- (b) **The site or part(s) of the site involved in the packaging, storing, loading, unloading, using and handling of hazardous substances shall be serviced by a spill containment system. The spill containment system shall:**
- (i) be constructed from impervious materials that are resistant to the hazardous substances involved;
 - (ii) be able to contain half of the maximum volume of substances used or stored above ground on the site;

- (iii) be designed, constructed, and managed so that any spill or release of any hazardous substance and any stormwater that may have entered and become contaminated in the spill containment system, is:
- prevented from entering the stormwater drainage system;
 - prevented from discharging into or onto land or ground water, any water body, or potable water supply, unless permitted by a resource consent.
- (c) **That part of a site where vehicles, equipment or containers that are, or may have become contaminated with hazardous substances, are washed, shall be designed and constructed so that the contaminated effluent from the wash down area or washing facility cannot be discharged into the stormwater drainage system , to land, to ground water, to any water body, or to potable water supply unless permitted by resource consent.**

In determining what conditions to impose, if any, Council will, in addition to the City View objectives in Section 2 and Hazardous Substance objectives, policies and rules, assess applications in terms of the following further policies:

- (a) To avoid, remedy or mitigate the potential effects of the activity on people, property and environmentally sensitive areas in the event of an accidental or unintentional release, or loss of control, of a hazardous substance.
- (b) To require that site / operational management plans and systems, and the design and construction of any hazardous facility assist in preventing the accidental or unintentional release, or loss of control, of hazardous substances.
- (c) To require that site/ operational management plans and systems, and the design and construction of any hazardous facility assist in remedying or mitigating effects on property, the environment and people where an accidental or unintentional release, or loss of control, of hazardous substances has occurred.
- (d) To require the provision of adequate emergency response plans to deal with, and prevent the re-occurrence of the adverse effect associated with the accidental or unintentional release, or loss of control, of hazardous substances.
- (e) To require that waste management plans ensure the appropriate disposal of any waste hazardous substances.
- (f) To require that procedures minimise the storage and use of hazardous substances and maximise the storage of hazardous substances in purpose built facilities.

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R 14.8.2 The Use, Storage and Transportation of Hazardous Substances used by Teaching and Research Laboratories

The use, storage or transportation of hazardous substances by teaching and research laboratories is exempt from the HFSP and is a Controlled Activity in respect of:

- **construction of laboratories;**
- **safety in laboratories;**
- **storage of hazardous substances;**
- **procedures to maintain inventories of hazardous substances used or stored in**

the laboratory;

- procedures to minimise the quantities of hazardous substances (especially flammable substances) stored or used in laboratories to levels which are reasonably required to undertake the necessary research and teaching activities, and to store any superfluous hazardous substance quantities in purpose-built facilities;
- a hazardous waste management plan including guidelines on the disposal of hazardous waste and the waste contractors to be used;
- an emergency plan which systematically identifies the hazards in the laboratory and addresses the actions to be taken in the event of emergencies;
- a procedure to maintain a register of, and to regularly review, incidents and accidents.

In determining what conditions to impose, if any, Council will, in addition to the City View objectives in Section 2 and the Hazardous Substance objectives, policies and rules, assess applications in terms of the further policies (a) to (f) within R 14.8.1.



R 14.8.3 The Use, Storage and Transportation of Hazardous Substances by Temporary Military Training Activities which is not a Permitted Activity

The use, storage or transportation of hazardous substances by any Temporary Military Training Activity, which is not a Permitted Activity, shall be a Controlled Activity in respect of:

- hazardous substances to be used in the training exercise;
- procedures to minimise environmental effects and risks associated with the use, storage and transportation of hazardous substances;
- the management plan for hazardous waste disposal;
- emergency procedures for likely accident scenarios, and the measures taken to avoid, remedy or mitigate environmental effects;
- reporting procedures for any accidents which result in significant environmental effects.

In determining what conditions to impose, if any, Council will, in addition to the City View objectives in Section 2 and Hazardous Substance objectives, policies and rules, assess applications in terms of the further policies (a) to (f) within R 14.8.1.

Explanation

The Controlled Activities listed above include specific activities, i.e. service stations, teaching and research laboratories, and temporary military training activities. These activities are exempted from the HFSP either because their effects and risks can be adequately managed by other, well established controls, or they are difficult to assess on an individual basis because they vary in locality or time.

There are a range of existing codes of practice and standards for service stations and teaching and research laboratories. However, these codes of practice or standards are not embedded in any legislation and are, therefore, voluntary. It is therefore necessary to ensure that where these codes or standards are not complied with, Council has the ability to closely and rigorously assess these activities and that their potential effect on people, property and the environment are effectively prevented or mitigated. Council also need to be able to check whether other performance standards which are necessary to ensure the safe operation of activities concerned are complied with.

Adherence to the following codes of practice or standards will constitute an acceptable means to satisfy some of the matters over which the Council reserves its control in relation to service stations and

teaching and research laboratories:

Service Stations

- *The Code of Practice for the 'Design, Installation and Operation of Underground Petroleum Systems' (Department of Labour, 1992, or successive code);*
- *The Australian Standard 'LP Gas storage and handling - Siting of LP Gas automotive retail' (AS1596-1989 or successive standard)*

Teaching and Research Laboratories

The Australian Standards, or successive standards:

- AS 2982-1987 *Laboratory Construction*
- AS 2243.1-1990 *Safety in Laboratories Part 1: General*
- AS 2243.2-1990 *Safety in Laboratories Part 2: Safety in laboratories*
- AS 2243.3-1990 *Safety in Laboratories Part 3: Microbiology*
- AS 2243.5-1990 *Safety in Laboratories Part 5: Non-ionising Radiation*
- AS 2243.6-1990 *Safety in Laboratories Part 6: Mechanical Aspects*
- AS 2243.7-1990 *Safety in Laboratories Part 7: Recirculating Fume Cabinets*
- AS 2243.10-1990 *Safety in Laboratories Part 10: Storage of Chemicals*

14.9 Discretionary Activities (Restricted)



R 14.9.1 Discretionary Activities (Restricted)

Hazardous Facilities which are Equal to or Below the Effects Ratio for Permitted Activities Identified in Appendix 14A and which do not Comply with the Performance Conditions For Permitted Activities in relation to:

- (i) spill containment systems**
- (ii) underground storage tanks**

are Discretionary Activities (Restricted) with regard to:

- **Public Health and Safety**
- **Environmental Damage**

Non-Notification

- (i) No such application shall be notified.
- (ii) Consent will not be required from any affected party.

In determining whether to grant consent and what conditions if any to impose, Council will, in addition to the City View objectives in Section 2 and Hazardous Substances objectives and policies, assess any application in terms of the following further policies.

- (a) To ensure that any spillage or a release of a hazardous substance will not contaminate land, ground water, water bodies or a potable water supply.
- (b) To provide measures to ensure stormwater originating on site or collected on the site will not contaminate land, ground water, any water body or potable water supply by acting as a carrier or transport medium for hazardous substances.
- (c) To avoid, remedy or mitigate the potential for stormwater originating on the site or collected on the site, entering or being discharged into any drainage utility system.

- (d) To ensure procedures exist such that when a hazardous substance must, as its intended function, be placed in or on ground, or water, that it is managed to avoid contamination of land, ground water, any water body, or potable water supply outside the intended area.
- (e) To ensure that any hazard substance, the intended function of which requires it to be placed in or on the ground, or water, is not allowed to enter or be discharged into any stormwater system.
- (f) To avoid, remedy or mitigate the effects of any accidental spill of hazardous substances, on human health and safety.

Explanation

The potential consequences of any accidental spill of hazardous substances or any general mismanagement of them, is so significant that any application must be closely and rigorously assessed. In doing so, Council will consider other legislative requirements which deal with the health and safety aspects of hazardous substances, such as the Council's Trade Waste By-Law.



R 14.9.2 The use, storage or transportation of hazardous substances by service stations which do not comply with the performance conditions for R 14.8.1

The use, storage or transportation of hazardous substances by service stations which do not comply with the Performance Conditions for R 14.8.1 is a Discretionary Activity (Restricted) with regard to:

- **Public Health and Safety;**
- **Environmental Damage.**

Non-Notification: Such an application may be considered without -

- (i) Notification; or
- (ii) The need to obtain the written approvals of affected parties.

In determining whether to grant to consent and what conditions, if any, to impose, Council will, in addition to the City View objectives in Section 2 and Hazardous Substances objectives and policies, assess any application in terms of the following further policies.

- (a) To ensure that any spillage or a release of a hazardous substance will not contaminate land, ground water, water bodies, or a potable water supply.
- (b) To provide measure to ensure stormwater originating on site or collected on the site will not contaminate land, ground water, any water body or potable water supply by acting as a carrier or transport medium for hazardous substances.
- (c) To ensure procedures exist such that when a hazardous substance must, as its intended function, be placed in or on ground, or water, that is managed to avoid contamination of land, ground water, any water body, or potable water supply outside the intended area.
- (d) To ensure that any hazardous substance, the intended function of which requires it to be placed in or on the ground, or water, is not allowed to enter or be discharged into any stormwater system.

- (e) To ensure that the site management plans and systems and site design and construction, assist in avoiding, remedying or mitigating the accidental or unintentional release, or loss of control, of hazardous substances.
- (f) To require that site management plans and systems, and site design and construction, avoid or mitigate any adverse effects on property, the environment and people where there is an accidental or unintentional release, or loss of control, of hazardous substances.
- (g) To ensure appropriate traffic routes are used to transport, transfer or distribute hazardous substances.
- (h) To require the provision of adequate emergency response procedures to deal with any adverse effects associated with the accidental or unintentional release, or loss of control, of hazardous substances.
- (i) To avoid, remedy or mitigate the potential effects of the activity on people, property and environmentally sensitive areas in the event of an accidental or unintentional release, or loss of control, of hazardous substances.

Explanation

Council is prepared to consider applications for the use, storage or transportation of hazardous substances by service stations which do not comply with Controlled Activity Performance Conditions where it is satisfied that the risks to neighbours, the surrounding environment and the City at large will be avoided, remedied or mitigated.

14.10 Discretionary Activities (Unrestricted):



R 14.10.1 Discretionary Activities (Unrestricted)

Hazardous Facilities which Exceed the Effects Ratio for Permitted Activities Identified in Appendix 14A, except for those specified as Controlled Activities, are Discretionary Activities (Unrestricted).

In determining whether to grant consent and what conditions, if any, to impose, Council will in addition to the City View objectives in Section 2 and Hazardous Substances objectives and policies, assess the application in terms of the following further policies:

- (a) To avoid remedy or mitigate the potential effects of the activity on people, property and environmentally sensitive areas in the event of an accidental or unintentional release of a hazardous substance.
- (b) To ensure that site management plans and systems and site design and construction, assist in avoiding remedying or mitigating the accidental or unintentional release of hazardous substances.
- (c) To require that site management plans and systems, and site design and construction, avoid or mitigate any adverse effects on property, the environment and people where there is an accidental or unintentional release of hazardous substances.
- (d) To ensure appropriate traffic routes are used to transport, transfer or distribute hazardous substances.
- (e) To require the provision of adequate emergency response procedures to deal with any adverse effects associated with the accidental or unintentional release of hazardous

substances.

Explanation

Provisions controlling the establishment of hazardous facilities within a zone do not cover the complete range and scale of those activities that may wish to site within that zone. Council is prepared to consider applications for facilities which exceed stated hazardous facility effects thresholds where it is satisfied that the risks to neighbours, the surrounding environment and the City at large will be avoided, remedied or mitigated.

APPENDIX 14A

THE CONSENT STATUS OF HAZARDOUS FACILITIES

Zone	Effects Ratio for <u>Permitted Activities</u>	Effects Ratio for <u>Discretionary Activities (Unrestricted)</u>
Industrial and North East Industrial	(a) ≤ 0.2 for hazardous facilities within 30 metres of a Residential Zone boundary or a Residential Zone Boundary across a road, right of way, access strip, service lane or drain. (b) ≤ 1.0 for Hazardous Facilities not included in (a)	(a) > 0.2 for hazardous facilities within 30 metres of a Residential Zone boundary or a Residential Zone Boundary across a road, right of way, access strip, service lane or drain. (b) > 1.0 for Hazardous Facilities not included in (a)
Airport	≤ 1.0	> 1.0
Institutional	(a) ≤ 0.2 for Hazardous Facilities or Sub-Facilities within 30 metres of a Residential Zone boundary or a Residential Zone boundary across a road, right of way, access strip, service lane or drain. (b) ≤ 1.0 for Hazardous Facilities or Sub-Facilities not included within (a)	(a) > 0.2 for Hazardous Facilities or Sub-Facilities within 30 metres of a Residential Zone boundary or a Residential Zone boundary across a road, right of way, access strip, service lane or drain. (b) > 1.0 for Hazardous Facilities or Sub-Facilities not included within (a)
Inner Business	≤ 0.1	> 0.1
Outer Business	≤ 0.2	> 0.2
Local Business	≤ 0.1	> 0.1
Fringe Business	≤ 0.2	> 0.2
Residential	≤ 0.05	> 0.05
Rural	≤ 0.2	> 0.2
Race Training	≤ 0.1	> 0.1
Recreation	≤ 0.1	> 0.1
Showgrounds	≤ 0.1	> 0.1
Racecourse	≤ 0.1	> 0.1

NOTE TO PLAN USERS:

To calculate effects ratios, refer to Appendix 14.B of this Section, in particular “3. Using the HFSP, A Step-By-Step Guide”.

APPENDIX 14B

HAZARDOUS FACILITIES SCREENING PROCEDURE

1. INTRODUCTION

The Hazardous Facility Screening Procedure (HFSP) has been designed as a screening tool to assist the Council in determining whether a proposed hazardous facility is a Permitted Activity or a Discretionary Activity requiring additional assessment of risks.

The HFSP will be applied to any facility proposing to use, store or transport hazardous substances. Its purpose is to determine whether the facility is a Permitted Activity subject to defined minimum performance conditions, or will require a land use resource consent for the use, storage or transportation of hazardous substances.

As explained in Section 14.1, the Manawatu-Wanganui Regional Council has assumed responsibility for managing the use, development and protection of land to prevent or mitigate any adverse effects of the disposal of hazardous substances.

Hazardous facilities range from home occupations using hazardous or environmentally damaging substances to large chemical factories. Common examples of hazardous substances are acids, solvents, paints, fuels and pesticides. Environmentally damaging substances include seemingly harmless substances such as foodstuffs (e.g. milk), which kill aquatic life when released into water ways in large quantities, for example, due to depletion of oxygen.

2. OVERVIEW AND TERMINOLOGY

The HFSP is based on the assessment of hazardous substances in terms of three major *Effects Groups*: **fire/explosion**, **human health**, and the **environment**. Each substance is assigned a *Base Threshold* (B) - expressed as a weight or volume - for each of the three defined *Effect Groups*. The *Base Threshold* is dependent only on the intrinsic hazardous properties of a substance.

Depending on the physical state of the substance(s), the type of storage and activity, site separation distances and the environmental sensitivity of the location, *Adjustment Factors* (F) are applied to the *Base Thresholds*. *Base Thresholds* and *Adjustment Factors* are then multiplied to generate an *Adjusted Threshold* (T) for each of the *Effects Groups*.

The next step is the calculation of the *Effects Ratio* (R), which represents the proposed quantity of a substance (Q) to be used/stored in relation to the *Adjusted Threshold*. The *Effects Ratio* forms the basis to determine the consent status of a particular facility, and to evaluate the cumulative effects presented by multiple substances.

TABLE 14.1**ASSIGNMENT OF BASE THRESHOLDS FOR HAZARDOUS SUBSTANCES IF UN CLASSIFICATION IS KNOWN**

Note: Other subsidiary effects of a hazardous substance are determined separately from the tables in Appendix 14C: Classification of hazardous substances. Using Table 14.1 and appendix 14C enables all three Effects Categories for a hazardous substance to be determined, i.e., fire/explosion effect, human health effect and environmental effect.

Fire and Explosion Effects Group

UN CLASS	EFFECT CATEGORY : FLAMMABLES			
	Low	Medium	High	Extreme
LPG		LPG		
2			2.1 exclude LPG	
3	3C	3PGIII	3PGI - PGII	
4			4.1	4.2 - 4.3
5 B(tonnes) ₁	100	30	5.1 10	5.2 1
B(m ³) ²			10 000	

UN CLASS	EFFECT CATEGORY : EXPLOSIVES			
	Low	Medium	High	Extreme
1 B(tonnes) ₃		1.3 3	1.2 1	1.1 0.1

Human Health Effects Group

UN CLASS	EFFECT CATEGORY : HUMAN HEALTH			
	Low	Medium	High	Extreme
2			2.3(b) - (d)	2.3(a)
6	6.1PGIII	6.1PGII	6.1PGI(b)	6.1PGI(a)
8 B(tonnes) ₄	30	8PGI - PGII 10	1	0.1
B(m ³) ⁵			500	50

Environmental Effects Group

UN CLASS	EFFECT CATEGORY : ENVIRONMENTAL			
	Low	Medium	High	Extreme
3		3C		
8			8PGI - PGIII	
Pesticide				Pesticide
Eco-toxic B ⁶	Groups 1d & 2d 100	Groups 1c & 2c 30	Group 1b 3	Group 1a 0.3

¹ B = Base Threshold in tonnes

² B = Base Threshold in m³ for permanent or compressed gases

³ B = Base Threshold in tonnes

⁴ B = Base Threshold in tonnes

⁵ B = Base Threshold in m³ for permanent or compressed gases

⁶ B = Base Threshold in tonnes

TABLE 14.2:
ADJUSTMENT FACTORS FOR EACH EFFECTS GROUP

ADJUSTMENT FACTORS FOR FIRE/EXPLOSION EFFECTS GROUP	ADJUSTMENT FACTORS FOR HUMAN HEALTH EFFECTS GROUP	ADJUSTMENT FACTORS FOR ENVIRONMENTAL EFFECTS GROUP
F1: Substance Form	F1: Substance Form	F1: Substance Form
Solid = 1 Liquid, Powder = 1 Gas = 0.1 (at 101.3 kPA and 20°C)	Solid = 3 Liquid, Powder = 1 Gas = 0.1 (at 101.3 kPA and 20°C)	Solid = 3 Liquid, Powder = 1
F2: Handling/Storage Conditions	F2: Separation Distance from Site Boundary (for gases only)	F2: Environmental Sensitivity
Temp < flash point = 1 Temp > flash point < boiling point = 0.3 Temp > boiling point = 0.1	<p>(a) Hazardous Facilities:</p> <p>≤ 30 metres = 1 > 30 metres = 3</p> <p>(b) Hazardous Sub-Facilities</p> <p>(i) ≤ 30 metres separation distance from site or zone boundary</p> <p>OR</p> <p>≤ 60 metres separation distance from another hazardous sub-facility</p> <p>(ii) > 30 metres separation distance from site or zone boundary</p> <p>AND</p> <p>> 60 metres separation distance from another hazardous sub-facility</p>	<p>More than 100 metres from a waterbody = 1 Adjacent to or within 100 metres of a waterbody = 0.3</p> <p>Note: Waterbody includes streams, springs, sea, lakes, estuaries, wetlands, etc. but excludes aquifers and entry points to stormwater drainage network</p>

3. USING THE HFSP: A STEP-BY-STEP GUIDE

This section works through a step-by-step guide on how to use the Hazardous Facility Screening Procedure (HFSP), following the steps shown in Figure 14.1.

STEP 1: Assemble site-specific information

Site specific information is an essential component of the HFSP, as it identifies any sensitive land uses or environmental features on or near the site which need to be noted.

STEP 2: Compile hazardous substances inventory

To use the Hazardous Facility Screening Procedure, it is necessary to create a full inventory of substances held on a site, including substances that are only stored or used temporarily such as waste hazardous substances. The inventory should list:

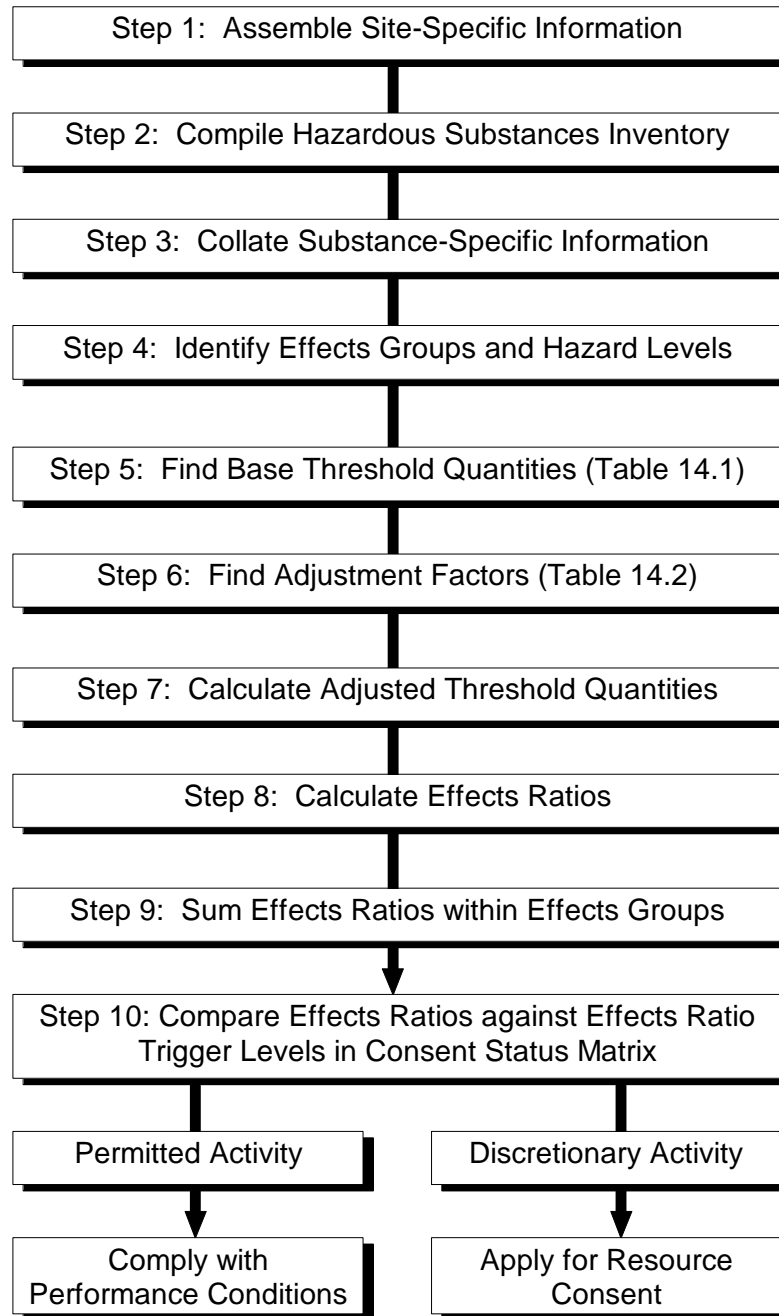
- the names of substances (including proprietary names and suppliers where necessary);
- quantities;
- UN classifications of all the hazardous substances on the site; and
- whether the substance is used or stored.

The HFSP uses the standard units of tonnes (for solids, liquids and liquefied gases) and m³ (for compressed gases), and it may be necessary to convert substance quantities to these units. In the case of liquids, it is necessary to apply the specific gravity (or density) to convert litres to kilograms, or m³ to tonnes. The specific gravity is the specific weight of a liquid in relation to that of water.

Conversions of quantities may also be necessary where a substance is diluted, or mixed with another substance. In this instance, only the percentage of the pure substance in the dilution or mixture is accounted for. For example, if it is proposed to store 10 tonnes of a substance that has a concentration of 30%, the proposed quantity should be 3 tonnes.

An exception to this are corrosives (UN Class 8) and oxidising substances (UN Class 5), where the UN Class is sometimes directly applied to specific commercially available concentrations. In these instances, conversions are only applied when these commercially supplied concentrations are further diluted for specific purposes.

**Figure 14.1:
A Step-by-Step Guide to the Hazardous Facility Screening Procedure**



Pesticides are also substances which are commonly available as diluted commercial products. The United Nations Recommendations on the Transport of Dangerous Goods (1993) lists a range of pesticides and their dilutions, and their related Packaging Groups in Class 6.1 in terms of a human poison rating.

If a substance is in a mixed form, proposed quantities for the percentage of pure substance in the mixture should be listed. In cases where synergistic effects result in a mixture that is more hazardous than its components, the mixture may need to be subjected to appropriate testing procedures to obtain the necessary information, unless relevant information is readily available.

It is also important to note that small packages are treated in a similar manner to bulk quantities. While small packages or containers reduce the risk of a major spill, they may still react like bulk quantities in some emergencies. For this reason, a conservative approach has been taken, especially as the HFSP generally does not apply to retail outlets.

In some cases, it may be difficult to decide whether a substance is in use or storage. The HFSP considers a substance in use when the full amount of the substance is used at any one time, an example is an acid bath. A substance that is taken from a container and used in small amounts while its bulk continues to be stored would be rated as being storage.

STEP 3: Collate substance specific information

It is an essential component of the HFSP to assign a hazard level for each Effects Group to the hazardous substances held on the site. To do so, it is necessary to collect a range of information about the substances, including UN classifications.

This information can be extracted from the United Nations Recommendations on the Transport of Dangerous Goods 8th edition, Material Safety Data Sheets, national and international databases, and text/reference books.

Where the necessary information to carry out this step is not readily available from public information sources, a precautionary approach shall be taken, and the substance shall be assigned a high hazard level for the Fire/Explosion, Human Health, and Environmental Effects Groups.

Relevant information for some commonly used hazardous substances is available, on inquiry, from the Council.

STEP 4: Identify Effects Groups and hazard levels

For the purposes of the HFSP, the effects of substances are categorised into three groups:

- Fire/Explosion Effects: concerned with damage to property, the built environment and safety of people;
- Human Health Effects: concerned with the well-being and safety of people;
- Environmental Effects: concerned with damage to ecosystems and natural resources

Each Effects Group is divided into four hazards levels:

extreme high medium low

The division into low, medium, high and extreme hazard levels in each of the Effects Groups (Fire/Explosion, Human Health and Environmental) is predominantly based on the UN (United Nations) classification systems for hazardous substances as outlined in the UN Recommendations on the Transport of Dangerous Goods, 8th edition, and the classification proposed by the Organisation for Economic Cooperation and Development (OECD) for health and environmental effects.

It is important to note that the above classification systems are inadequate for assigning Effects Group hazard levels to certain hazardous substances, particularly toxic substances (Class 6.1), toxic gases (Class 2.3) and environmentally toxic substances (Ecotoxic Class).

The following points should be noted:

- for the purposes of the HFSP, the classification of these substances (Classes 6.1, 2.3

- and Ecotoxic) has been refined to account for extremely hazardous substances;
- environmentally damaging substances have been placed into the Ecotoxic class. Foodstuffs such as milk are an example of an environmentally damaging substance;
 - hazardous substances lists based on the UN Classification System often only list the primary hazard of a substance and sometimes one subsidiary hazard although a substance may have different effects in each of the Effects Groups.

For example, a single substance may present:

- a medium explosive effect;
- an extreme human health effect; and
- a high environmental effect

Hence, the HFSP allows for the fact that many substances may fit into more than one Effects Group, which is similar to the approach taken in the Hazardous Substances and New Organisms legislation.

Hazardous substances (including raw materials, product and wastes) can be classified into Effects Groups and assigned a hazard level for each Effects Group using Appendix 14C, which lists UN Classes, Packaging Groups and other relevant information.

It should be noted that the HFSP also accounts for combustible liquids such as cooking oils that are not usually assigned a UN Class rating.

The classification of substances or assignment of hazard levels is, in the first instance, carried out according to their UN Classification. For example, a UN Class 8, Packaging Group ii substance is always assigned a medium Human Health Effects Group hazard level and a high Environmental Effects Group hazard level. Only when the UN classification does not account for an Effects Group, or the substance does not have a UN rating, should other information be used to classify the substance.

STEP 5: Find Base Threshold quantities

The Base Threshold (B) is a pre-calibrated quantity. It is the amount of a substance that has been assessed as generating no significant off-site effects in a heavy industrial area before site and substance-specific considerations have been taken into account. These aspects are addressed through the application of Adjustment Factors. Base Thresholds corresponding to the hazard levels in each Effects Group are listed in Table 14.1

For example, in the Fire/Explosion Effects Group [Sub-category Flammables], non-significant off-site effects in a heavy industrial area would be represented by Base Thresholds of:

- 100 tonnes of a combustible liquid, which has a low level in the Fire/Explosion Effects Group.
- 30 tonnes of a Class 3, Packaging Group III substance, which are flammable liquids with a medium hazard level in the Fire/Explosion Effects Group

STEP 6: Find Adjustment Factors

Pre-calibrated Adjustment Factors (FF, FH and FE) are used to multiply the Base Threshold quantities in order to take account of the substance properties and specific circumstances on each site which will influence the severity of any potential effect. This multiplication yields the Adjusted Threshold (T) (see Step 8).

Adjustment Factors differ for each of the Effects Groups, and take into account the following considerations:

- the physical state of the substance;

- the pressure and temperature required for storage and usage;
- the type of storage;
- the type of activity or use;
- separation distances to the site boundary;
- the environmental sensitivity of the site location.

For each Effects Group, different types of Adjustment Factors are relevant.

Table 14.2 lists the pre-calibrated Adjustment Factors to be used for each Effects Group.

In some instances, more than one Adjustment Factor within each Effects Group will need to be applied to a substance. Where this is the case, the Adjustment Factors are multiplied to generate one combined Adjustment Factor (FF, FH, or FE) for each Effects Group, and the Base Threshold is then multiplied by that one Factor.

STEP 7: Calculate Adjusted Threshold quantities

The Adjusted Threshold (T) is calculated for each Effects Group by multiplying the Base Threshold (B) by the relevant Adjustment Factor (FF, FH, FE), as follows:

- $T = B \times FF$ provides the Adjusted Threshold for a substance in the Fire/Explosion Effects Group
- $T = B \times FH$ provides the Adjusted Threshold for a substance in the Human Health Effects Group
- $T = B \times FE$ provides the Adjusted Threshold for a substance in the Environmental Effects Group

STEP 8: Calculate Effects Ratios

The effects Ratio (R) is a dimensionless number. It is obtained by dividing the quantity of a substance (Q) that is proposed to be used or stored on a site by the Adjusted Threshold (T):

$$\text{Effects Ratio (R)} = \frac{\text{Proposed quantity of substance (Q)}}{\text{Adjusted Threshold (T)}}$$

The effects Ratio fulfils two important purposes:

- by using a dimensionless ratio of the proposed quantity of a hazardous substance over the Adjusted Threshold instead of Adjusted Threshold itself, it is possible to aggregate the effects presented by multiple substances held on the same site. Hence, it becomes possible to assess the cumulative potential effects which may be created by several substances present on the same site and which have similar hazardous properties;
- it forms the basis of defining the trigger levels in the Consent Status Matrix which are used to determine the consent status of a particular facility. Whether or not a proposed facility requires a resource consent is determined by assessing whether the calculated Effects Ratios exceed the trigger levels in the Consent Status Matrix.

STEP 9: Sum the Effects Ratios to find the total Effects Ratio

When assessing several hazardous substances on a site, it is necessary to add the Effects Ratios within each Effects Group together.

STEP 10: Determine consent status against Consent Status Matrix

The sum of all Effects Ratios within each Effects Group determines the consent status of a particular site when compared against the Effects Ratio trigger levels in the Consent Status Matrix for that Effects Group. In most cases the same trigger value would cover all Effects Groups; in these situations, only the highest Effects Ratio in any three Effects Groups needs to be considered to identify the consent status, for example, whether a hazardous facility or activity is permitted, controlled or discretionary.

APPENDIX 14C:

CLASSIFICATION OF HAZARDOUS SUBSTANCES

HAZARD	UN CLASS	DESCRIPTION
Explosives	1.1	Articles and substances having a mass explosion hazard
	1.2	Articles and substances having a projection hazard, but not a mass explosion hazard
	1.3	Articles and substances having a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard. This division comprises articles and substances that give rise to considerable radiant heat, or burn one after another, producing minor blast and/or projection effects.
	1.4, 1.5 & 1.6	Not applicable
Flammable Gases	2.1	Flammable gases: Gases which at 20°C and a standard pressure of 101.3 kPA: are ignitable when in a mixture of 13% or less by volume with air, or; have a flammable range with air of at least 12% regard-less of the lower flammability limit This class includes aerosols containing flammable propellants.
	2.2	Not applicable
	2.3	Toxic gases: gases which are known to be toxic or corrosive to humans as to pose a hazard to health. This division is divided into four categories: (a) Extreme Inhalation toxicity vapours LC ₅₀ : < 200 ppm (= ml/m ³) and V ⁽¹⁾ > 10 x LC ₅₀ (extreme). (b)-(d) High Inhalation toxicity vapours LC ₅₀ : < 5 000 ppm (= ml/m ³) and V(1)>LC ₅₀ . (1) $V=(p/P) \times 106$ ppm or ml/m ³ , where P = 760 mm Hg and p = Vapour Pressure (20°C).
Flammable Liquids		Flammable liquids comprising liquids, mixtures of liquids, or liquids containing solids in suspension which give off a flammable vapour at specific temperatures. This class is divided into packaging groups (PG).
	3PGI	Flash point: < 23°C Initial boiling point: < 35°C
	3PGII	Flash point: <23°C Initial boiling point: >35°C
	3PGIII	Flash point: >23°C; <61°C Initial boiling point: >35°C
	3C	Flash point:>61oC

HAZARD	UN CLASS	DESCRIPTION
Toxic; Poisons, Pesticides	6.1	Poisonous substances: Poisonous substances which are liable to cause death or injury or harm to human health if swallowed, inhaled or contacted by the skin. This division is divided into three packaging categories.
	6.1PGI	<p>(a) Extreme</p> <p>Oral toxicity LD₅₀ (mg/kg): <1 Dermal toxicity LD₅₀ (mg/kg): <10 Inhalation toxicity dust/mist LC₅₀ (mg/l): <0.5 Inhalation toxicity vapours LC₅₀: <200 ppm (=ml/m³) and V⁽¹⁾ > 10 x LC₅₀ (extreme)</p> <p>(b) High</p> <p>Oral toxicity LD₅₀ (mg/kg): <5 Dermal toxicity LD₅₀ (mg/kg): <40 Inhalation toxicity dust/mist LC₅₀ (mg/l): <0.5 Inhalation toxicity vapours LC₅₀: <1000 ppm (=ml/m³) and V⁽¹⁾ > 10 x LC₅₀ (high)</p> <p>(recognised carcinogen, teratogen or mutagen)</p>
	6.1PGII	<p>(c) Medium</p> <p>Oral toxicity LD₅₀ (mg/kg): <50 Dermal toxicity LD₅₀ (mg/kg): <200 Inhalation toxicity dust/mist LC₅₀ (mg/l): <2 Inhalation toxicity vapours LC₅₀: <3000 ppm (=ml/m³) and V⁽¹⁾ > LC₅₀</p>
	6.1PGIII	<p>(d) Low</p> <p>Oral toxicity LD₅₀ (mg/kg): <500 (liquids) / <200 (solids) Dermal toxicity LD₅₀ (mg/kg): <1000 Inhalation toxicity dust/mist LC₅₀ (mg/l): <10 Inhalation toxicity vapours LC₅₀: <5000 ppm (=ml/m³) and V⁽¹⁾ > LC₅₀</p>
	Pesticides	<p>Division into specified UN Packaging Classes according to percentage of active substance, (refer to United Nations "Recommendations on the Transport of Dangerous Goods", 8th edition, 1993).</p> <p>⁽¹⁾ $V = (p/P) \times 10^6$ ppm or ml/m³, where P = 760 mm Hg and p = vapour pressure (20°C)</p>
	6.2	Not Applicable
Radioactive		Not Applicable
Corrosives	8PGI	Very dangerous substances and preparations
	8PGII	Substances and preparations presenting medium damage
	8PGIII	Substances and preparations presenting minor danger

HAZARD	UN CLASS	DESCRIPTION
Eco-toxic		<p>GROUP 1 Eco-toxic substances: any substances exhibiting a toxic effect on the ecosystem, based on the toxicity to aquatic life. This division is sub-divided into four categories:</p> <p>(a) Extreme 96 hr LC₅₀ salmonid fish (mg/l) < 0.1 48 hr EC₅₀ daphnia (mg/l) < 0.1 72 hr EC₅₀ algae (mg/l) < 0.1 Pesticides (unless toxicity data can be demonstrated to show lesser toxicity.)</p> <p>(b) High 96 hr LC₅₀ salmonid fish (mg/l) < 1.0 48 hr EC₅₀ daphnia (mg/l) < 1.0 72 hr EC₅₀ algae (mg/l) < 1.0</p> <p>(c) Medium 96 hr LC₅₀ salmonid fish (mg/l) < 10.0 48 hr EC₅₀ daphnia (mg/l) < 10.0 72 hr EC₅₀ algae (mg/l) < 10.0</p> <p>(d) Low 96 hr LC₅₀ salmonid fish (mg/l) < 100.0 48 hr EC₅₀ daphnia (mg/l) < 100.0 72 hr EC₅₀ algae (mg/l) < 100.0</p>
		<p>GROUP 2 Environmentally damaging or persistent substances: any substance exhibiting (other than toxic) effect on the ecosystem. This division is sub-divided into two categories:</p> <p>(c) Medium BOD₅ (mg/l)⁽¹⁾ > 10 000</p> <p>(d) Low BOD₅ (mg/l)⁽¹⁾ > 1 000</p> <p>⁽¹⁾ stands for 5-day biochemical oxygen demand</p>