

**16.7 HAZARDOUS SUBSTANCES***Refer to Policy set 5.5***16.7.1 Scope of Section**

This section deals with the use and storage of hazardous substances throughout the District. Chapter 25 contains a rule applying this section to the Coastal Marine Area. Information required with resource consent applications is detailed in Chapter 19.

The rules in this section are regional rules and have effect under Section 20A of the Act, in relation to existing activities.

**16.7.2 Hazardous Facilities****16.7.2.1 Permitted Activities (Hazardous Facilities)**

A hazardous facility is a permitted activity that may be undertaken without a resource consent, if it complies with the following conditions:

- (a) The activity:
- (i) has a total quantity ratio calculated in accordance with Schedule 16.7A that does not exceed the consent status index for permitted activities for the zone in which it is located or to be located, as specified in Figure 16.7A; or
  - (ii) is the use or storage of any radioactive material with an activity that:
    - does not exceed 100 terabecquerels; or
    - is specified as an exempt activity in the Radiation Protection Regulations 1982; or
  - (iii) is the bulk storage of less than 5,000 litres of petrol, oil, or diesel, except in the Richmond West Development Area, other than in the Industrial and Rural Industrial Zones within this Area.

C10 10/07  
Op 3/14**Figure 16.7A: Consent Status Table**

ZONE	CONSENT STATUS INDEX				
	FOR ALL PERMITTED ACTIVITIES	FOR EXISTING ① CONTROLLED ACTIVITIES	FOR NEW ② CONTROLLED ACTIVITIES	FOR NEW ② DISCRETIONARY ACTIVITIES	FOR NON COMPLYING ACTIVITIES
Heavy Industrial and Rural Industrial	$\leq 0.75$ $\leq 0.1$ (if within 30m of a Residential Zone)	$> 0.75$ $> 0.1$ (if within 30m of a Residential Zone)	$0.75 - 1.5$ $0.1 - 0.2$ (if within 30m of a Residential Zone)	$> 1.5$ $> 0.2$ (if within 30m of a Residential Zone)	
Light Industrial	$\leq 0.5$ $\leq 0.1$ (if within 30m of a Residential Zone)	$> 0.5$ $> 0.1$ (if within 30m of a Residential Zone)	$0.5 - 1$ $0.1 - 0.2$ (if within 30m of a Residential Zone)	$> 1$ $> 0.2$ (if within 30m of a Residential Zone)	
Mixed Business	$\leq 0.2$ $\leq 0.1$ (if within 30m of a Residential Zone)	N/A	N/A	$> 0.2 \leq 0.65$	$> 0.1$ (if within 30m of a Residential Zone) $> 0.65$ (for new activities)
Rural 1 and Rural 2	$\leq 0.5$	$> 0.5$	$0.5 - 0.8$	$> 0.8$	

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ZONE	CONSENT STATUS INDEX				
	FOR ALL PERMITTED ACTIVITIES	FOR EXISTING ① CONTROLLED ACTIVITIES	FOR NEW ② CONTROLLED ACTIVITIES	FOR NEW ② DISCRETIONARY ACTIVITIES	FOR NON COMPLYING ACTIVITIES
Central Business and Commercial	≤0.2	>0.2	0.2 – 0.4	>0.4	
Central Business and Commercial	≤0.2	>0.2	0.2 – 0.4	>0.4	
Residential and Tourist Services	≤0.02	>0.02		>0.02	
Rural 3, Rural Residential and Papakainga	≤0.1	>0.1		>0.1	
Open Space, Recreation and Conservation	≤0.02	>0.02		>0.02	
<b>Footnotes:</b> ① “Existing” refers to any activity that was existing prior to 25 May 1996 and has effects at the same or similar character, intensity or scale to those which existed before this date. ② “New” refers to activities commencing on or after 25 May 1996. ③ “Existing” refers to any activity that was existing prior to 6 October 2007 for Richmond West Development Area.					

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- (b) The storage of hazardous substances that are agrichemicals in a hazardous facility existing as at 16 December 2000, complies with conditions (c) to (p) after 31 October 2005.

### Storage Tanks

- (c) Tanks for the storage of petroleum products are designed, constructed and operated to prevent any leakage or spills.

### Underground Storage Tanks

- (d) For underground tanks installed after 16 December 2000 in the Aquifer Contamination Risk Area for the storage of petroleum products, the following applies:
- (i) A secondary containment system is installed.
  - (ii) An observation well is installed inside the secondary containment system.
  - (iii) A spill container must be fitted at the fill point of the tank.
  - (iv) An overfill protection device must be fitted to the tank.
- (e) For underground storage tanks existing prior to 25 May 1996 for the storage of:
- (i) more than 5,000 litres petroleum products in areas outside the Aquifer Contamination Risk Area, and
  - (ii) up to 5,000 litres petroleum products in areas inside the Aquifer Contamination Risk Area the following apply:
    - (a) the tank and its pipework shall be leak tested to determine if the pipe or tank has a leak or maintains its integrity by a person suitably qualified and experienced in leak testing either:
      - at intervals of at least every five years; or
      - where stock reconciliation shows stock losses over three consecutive reconciliations; or
      - whichever is the lesser, and;
    - (b) for any tank that has been placed underground for more than 25 years, leak testing as required under item (ii)(a) shall be carried out annually and;

- (c) information about the leak testing and stock reconciliation shall be provided to Council on request.

**Note:** Underground storage tanks older than 25 years are considered to be unsafe.

### Site Design and Layout

- (f) The hazardous facility is designed, constructed and operated in a manner that prevents:
- (i) the unintentional release of the hazardous substance; and
  - (ii) the accumulation of any liquid or solid spills or fugitive vapours or gases in enclosed areas, likely to adversely affect the environment.
- (g) All stormwater grates must be clearly identified.
- (h) Any surface or container used to store or contain any hazardous substance must be sealed or impervious to the hazardous substance.
- (i) A site contingency and stormwater management plan appropriate to the nature and scale of risks of spills or accidents must be prepared and held on site. The plan must be reviewed annually and available for inspection by Council when requested. C10 10/07  
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**Notes:**

- (1) The Council has prepared guidelines to assist in the preparation of an appropriate site contingency plan.
  - (2) Specific performance requirements for the storage of hazardous substances are covered by HSNO regulations.
- (j) The types and quantities of hazardous substances used or stored on the site (including hazardous wastes generated on site) is recorded in a register kept available for inspection at any time by an enforcement officer of Council.

### Site Drainage Systems

- (k) A site drainage system is designed, constructed and operated in a manner so that:
- (i) any stormwater discharge complies with the Stormwater Discharge rules 36.4.2.1, 36.4.2.2 or 36.4.2.3;
  - (ii) the site drainage system prevents the discharge of any hazardous substance into any wastewater network unless permitted by the network utility operator; and
  - (iii) for any hazardous facility developed after 6 October 2007, all stormwater from each site is collected and conveyed through a stormwater interceptor treatment device so that any sediment, hydrocarbon or floating debris that may be discharged is able to be substantially retained by such a device before there is any discharge to the Council-maintained stormwater drainage network. C10 10/07  
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**Note:** Design information for stormwater interceptor treatment devices and stormwater treatment and collection systems is provided in the current Council Engineering Standards and Policies.

### Spill Containment System

- (l) Any part of the site of a hazardous facility where a hazardous substance spill may occur is serviced by a spill containment system that is:
- (i) constructed from impervious materials resistant to the hazardous substances used or stored on the site and:
    - (a) for liquid hazardous substances, is able to contain the maximum volume of the largest tank present, plus an allowance for stormwater or water used in fire fighting;

- (b) for drums or other smaller containers, is able to contain not less than 50 percent of the maximum volume of the substances stored, plus an allowance for stormwater or water used in fire fighting; and
- (ii) able to prevent the discharge of any spill or other unintentional release of any hazardous substance, or the discharge of any contaminated stormwater or water used in fire fighting into any wastewater network unless permitted by the network utility operator.

**Note:** An allowance for stormwater is achieved by making the bund deep enough to cope with a 48-hour duration, 20-year storm event. For example, in an area with similar rainfall to Richmond, the bund would need to be an extra 19 centimetres deep.

### Washdown Areas

- (m) Any part of the hazardous facility where vehicles, equipment or containers that are or may be contaminated with hazardous substances are washed, must comply with condition (k).

### Signage

- (n) Any hazardous facility is signposted to indicate the nature of the substances stored or used.

### Waste Management

- (o) Any part of the hazardous facility that generates, uses or stores any process waste containing any hazardous substance, or any other waste containing any hazardous substance on the site, complies with conditions (k) to (p).

### Areas Subject to Inundation

- (p) Any hazardous substance stored in any area subject to inundation from any source, including any area protected by any stopbank, is stored in such a manner that the substance cannot be moved by, released into or contaminates flowing water.

### Means of Compliance

These means of compliance list measures that may be adopted, as appropriate, for complying with the performance standards of rule 16.7.2.1. They are provided as guidance for Plan users. They include:

1. Adherence to relevant Codes of Practice such as:
  - (i) the *Code of Practice for the Management of Agrichemicals* NZS8409:1999 (or more recent edition);
  - (ii) the *Code of Practice for Design, Installation and Operation of Underground Petroleum Storage Systems* (OSH 1992, or subsequent versions);
  - (iii) the *Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand* (MfE 1998 or subsequent versions);
  - (iv) the New Zealand and Australian Standards AS 2982:1987 and AS 2243.1:1990 – AS 2243.10:1990 (or subsequent versions);
  - (v) for the storage of LPG, the New Zealand and Australian Standard AS 1596:1997 (or subsequent versions).
2. Use of secondary containment facilities in areas of environmental sensitivity such as aquifer recharge areas.
3. Provision of leak detection or monitoring systems that are capable of detecting failure or breach in the structural integrity of a primary containment vessel.

4. Roofing the hazardous facility.
5. Installing oil-water separators to minimise risk of petroleum products entering stormwater.
6. Ensuring storage areas slope away from the stormwater system.
7. Having interceptor drains to prevent hazardous substances from entering stormwater systems.
8. Using containment or diversion valves, overfill protection devices, holding tanks, sumps and bunds.

**16.7.2.2 Controlled Activities (Hazardous Facilities)**

A hazardous facility is a controlled activity, if it complies with the following conditions:

- (a) The activity:
  - (i) has a total quantity ratio calculated in accordance with Schedule 16.7A that is within the range of consent status indices for controlled activities for the zone in which it is located as specified in Figure 16.7A; or
  - (ii) is the storage of between 5,000 litres and 100,000 litres of petrol in underground tanks, and between 5,000 litres and 50,000 litres of diesel or oil in underground tanks; or
  - (iii) is the use, storage or disposal of any hazardous substance (other than any bulk hazardous substance storage facility) in any teaching or research laboratory; or
  - (iv) is the lawful storage of any hazardous substance at a hazardous facility existing as at 25 May 1996 where the effects are the same or similar in character, intensity or scale.
- (b) The activity must comply with conditions (c) to (p) of rule 16.7.2.1 except that where the activity was established prior to 25 May 1996, it must comply with condition (k).

**A consent is required** and may include conditions on the following matters over which the Council has reserved control:

For activities subject to condition (a)(i) and (iv), if applicable:

- (1) The design and proposed operation of the facility and any spill containment and other risk mitigation measures.
- (2) Emergency and spill contingency plan.
- (3) On-site transport of hazardous substances.
- (4) Site management plan.
- (5) Management of hazardous waste.
- (6) The cumulative effects from the facility itself or in combination with other facilities.
- (7) A register of accidents and incidents.

For activities subject to condition (a)(ii) and (iv), if applicable:

- (1) The location, design, installation and operation of underground storage facilities for petroleum products.
- (2) On-site transport of hazardous materials.
- (3) Emergency and spill contingency plan.

For activities subject to condition (a)(iii) and (iv), if applicable:

- (1) The construction and safety of laboratories.
- (2) Minimising the storage and use of chemicals within laboratories (especially flammable materials) and storage of any excess chemicals in a purpose-built bulk storage facility.
- (3) Management of hazardous wastes.
- (4) Emergency and spill contingency plan.
- (5) A register of accidents and incidents.

For all activities:

- (1) The degree of compliance with any relevant industry codes of practice.
- (2) The duration of the consent (Section 123 of the Act) and the timing of reviews of conditions and the purpose(s) of reviews (Section 128).
- (3) Financial contributions, bonds and covenants in respect of the performance of conditions, and administrative changes.

### Means of Compliance

These means of compliance list measures that may be adopted, as appropriate, for complying with the performance standards of rule 16.7.2.2. They are provided as guidance for Plan users. They include:

1. Adherence to relevant Codes of Practice such as:
  - (i) the *Code of Practice for the Management of Agrichemicals* NZS 8409:1999 (or more recent edition);
  - (ii) the *Code of Practice for Design, Installation and Operation of Underground Petroleum Storage Systems* (OSH 1992, or subsequent versions);
  - (iii) the *Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand* (MfE 1998 or subsequent versions);
  - (iv) the New Zealand and Australian Standards AS 2982:1987 and AS 2243.1:1990 – AS 2243.10:1990 (or subsequent versions);
  - (v) for the storage of LPG, the New Zealand and Australian Standard AS 1596:1997 (or subsequent versions);
2. Use secondary containment facilities in areas of environmental sensitivity such as aquifer recharge areas.
3. Provide leak detection or monitoring systems that are capable of detecting failure or breach in the structural integrity of a primary containment vessel.
4. Roofing the hazardous facility.
5. Installing oil-water separators to minimise risk of petroleum products entering stormwater.
6. Ensuring storage areas slope away from the stormwater system.
7. Having interceptor drains to prevent hazardous substances from entering stormwater systems.
8. Using containment or diversion valves, overflow protection devices, holding tanks, sumps and bunds.

**16.7.2.3 Restricted Discretionary Activities (Hazardous Facilities)**

A hazardous facility that does not comply with the permitted conditions of rule 16.7.2.1 or the controlled conditions of rule 16.7.2.2 is a restricted discretionary activity, if it complies with the following conditions:

- (a) The activity:
- (i) has a total quantity ratio calculated in accordance with Schedule 16.7A that exceeds the maximum consent status index for either permitted or controlled activities in the consent status table for zones in which it is located, as specified in Figure 16.7A, but does not exceed the maximum consent status index for discretionary activities; or
  - (ii) is the use or storage of any radioactive material with an activity greater than 100 TeraBecquerels.

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**A resource consent is required.** Consent may be refused or conditions imposed, only in respect of the following matters to which the Council has restricted its discretion:

- (1) The extent to which site design, construction and operation are able to prevent the contamination of air, land or water in the event of a spill or other unintended release of a hazardous substance during its use or storage.
- (2) Possible alternatives including alternatives to the proposed facility or alternative substances, quantities, processes or site management.
- (3) Whether the risks presented by the activity to people, the natural environment and property have been assessed systematically and fully and whether any residual risks are able to be mitigated and controlled adequately.
- (4) Preparation of emergency and spill contingency plans.
- (5) Off-site movement of hazardous substances.
- (6) Site management plans.
- (7) Waste management plans.
- (8) The adverse effects, including adverse cumulative effects of the facility on the risks to people, the environment and to property, either by itself or in combination with other hazardous facilities.
- (9) The degree of compliance with any relevant industry codes of practice.
- (10) The duration of the consent (Section 123 of the Act) and the timing of reviews of conditions and the purpose(s) of reviews (Section 128).
- (11) Financial contributions, bonds and covenants in respect of the performance of conditions, and administrative charges

**16.7.2.4 Non-complying Activities (Hazardous Facilities)**C10 10/07  
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Any activity that does not comply with condition 16.7.2.3(a)(i) is a non-complying activity.

**A resource consent is required.** Consent may be refused or conditions imposed.

## 16.7.3 Radioactive Material

### 16.7.3.1 Prohibited Activities (Radioactive Material Generation, Transport, Storage and Use)

No resource consent shall be granted for the following prohibited activities:

- (a) The generation of radioactive material.
- (b) The generation of energy from radioactive material or irradiating apparatus.
- (c) The transport, storage or use of radioactive material; except for the following activities undertaken in accordance with the Radiation Protection Act 1965:
  - (i) the transport, storage or use of radioactive material or the use of irradiating apparatus for industrial, medical, educational or research purposes;
  - (ii) the disposal of radioactive material;
  - (iii) the use of radioactive material in equipment and devices for detection, measurement and testing.

## 16.7.20 Principal Reasons for Rules

### Hazardous Facilities Screening Procedure

The rules, including Schedule 16.7A, incorporate a technical procedure to assess both on-site and off-site risks arising from the use or storage of hazardous substances, in what are called hazardous facilities, in the District. This procedure is called the Hazardous Facility Screening Procedure (HFSP). The HFSP is applied to hazardous facilities to determine whether they are permitted or need a resource consent.

The HFSP as a method focuses on the potential adverse effects or risks of hazardous substances used or stored at a hazardous facility. Effects are broadly divided into the following groups:

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

Any hazardous facility is assessed under the HFSP as set out in Schedule 16.7A to determine its total potential adverse effect, both on site and off site, or total quantity ratio, and thus its consent status index. Figure 16.7A then shows whether the facility needs a resource consent. The HFSP method is based on accepted risk management theory and scientific evidence concerning hazardous substances.

### Site Design and Management

These conditions should reduce the number of spills and reduce the adverse effects of those that do occur. Signs are important to inform emergency services and others what substances they can expect to find on site.

### Flood Ways

Special storage of hazardous substances is required in areas subject to flooding to ensure they are not swept away.

### Radioactive Material

The prohibition on the generation, use, transport, storage or disposal of radioactive material and irradiating apparatus is because, apart from the stated exceptions, these carry unacceptable risks of contamination and other environmental damage. This is consistent with the Regional Policy Statement.



### Existing Facilities

There are a large number of hazardous facilities in the district that are routinely used for the storage of hazardous substances. While their use may be commonplace, this is not to say that this activity is without risks. Council is seeking to address the risks from these existing facilities as well as new facilities. The mechanism used to achieve this is still the HSFP, which will result in a limit on the amount of hazardous substances able to be stored without the need for a resource consent, depending on the nature of the substance(s) stored, location in a zone and in relation to watercourses. The rules apply equally to existing and to new facilities. The HFSP results in most existing small-scale facilities including on-farm storage of pesticides being permitted activities and subject to minimum performance standards.

The Council also takes into account the expectation of owners or managers of hazardous facilities that their activity be allowed to continue. Existing activities that cannot comply with the performance standards for permitted activities will be considered as controlled activities (with no default to discretionary status). In this way Council can ensure that the risks from existing hazardous facilities that do not meet minimum performance standards can be addressed on a site-by-site basis.

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A lower consent status index means smaller amounts of hazardous substances can be stored as permitted activities. New proposed industrial zones will have infrastructure that better manages cumulative risks of contaminant discharges where there are more likely to be hazardous substances. Higher performance standards for stormwater control in particular, will be integral to new industrial zones.



**SCHEDULES****Schedule 16.7A: Calculation of Cumulative Quantity Ratios**

*Refer to rules 16.7.2.1, 16.7.2.2 and 16.7.2.3.*

**1. Background**

This Schedule shows how to obtain the total quantity ratio for any hazardous facility subject to rules 16.7.2.1, 16.7.2.2 and 16.7.2.3. The system used is the Hazardous Facilities Screening Procedure (HSFP) developed by a working group of local authorities and consultants, and more recently reviewed by a consultant firm for the Ministry for the Environment, in the publication “Land Use Planning Guide for Hazardous Facilities” (1999).

The calculated total quantity ratio is compared with the consent status index in Figure 16.7A referred to in the rules, in order to establish whether the hazardous facility is a permitted, controlled or discretionary activity.

**2. Scope of HFSP**

The HFSP is applicable to existing or proposed hazardous facilities in all land use zones (and in the coastal marine area) in addition to other rules. The procedure is applied to all hazardous facilities, regardless of their type and size. The HFSP is applicable to existing hazardous facilities as well as proposed because section 16.7 is a regional land use rule and Section 20 of the Act applies. Fundamentally, the HFSP is used to screen hazardous facilities *and* their sites. However, where hazardous facilities on the same site are separated more than 30 metres from each other, they are dealt with as a separate facility or hazardous sub-facility and the HFSP is applied to each of them separately.

**3. Terminology**

The HFSP uses a number of terms. These are listed and explained below.

<b>Term</b>	<b>Explanation</b>
Adjusted Quantity (A)	Equivalent to the Base Quantity that has been adjusted using Adjustment Factors.
Adjustment Factor	Pre-calibrated factors that take into account substance, storage and site-specific circumstances.
Base Quantity (B)	The amount (mass in tonnes or m <sup>3</sup> , at 101.3 kPa and 20°C, for compressed gases) of a substance that has been assessed as generating no significant off-site effects on a notional industrial site <u>before</u> site- and substance-specific consideration have been taken into account.
Consent Status Index	Numerical values of any Total Quantity Ratio that are used to determine the consent status of a hazardous facility.
Total Quantity Ratio	The total value of all the Quantity Ratios for each effect type calculated for individual hazardous substances proposed to be used or stored in a hazardous facility.
Effect Type	Three Effect Types are used by the HFSP: <ul style="list-style-type: none"> <li>• Fire/explosion</li> <li>• Effects on human health</li> <li>• Effects on ecosystems</li> </ul>
Hazard Rating	The level of hazard (high, medium or low) applied to a hazardous substance for the purpose of an HFSP calculation, based on its HSNO classification.
Proposed Quantity (P)	The quantity of a hazardous substance proposed to be used or stored on a site.
Quantity Ratio (Q)	The ratio of the proposed quantity of a substance over the applicable Base Quantity.

**4. Overview of HFSP**

The HFSP is designed to assess the environmental effects of hazardous substances proposed to be stored or used on a site, taking into account their quantities, characteristics, location, type of activity and local environmental conditions. This assessment is carried out for three defined effect types:

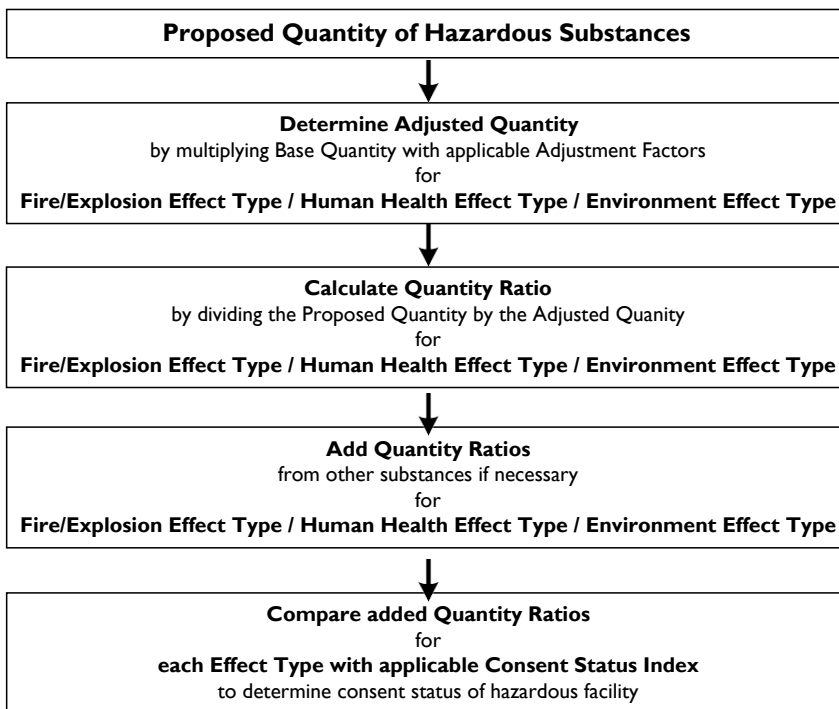
- fire/explosion
- human health
- the natural environment.

The HFSP compares proposed quantities of hazardous substances with maximum allowable quantities (adjusted quantities) which depend on the type of substances, how they are used and stored, and the location of the facility. A quantity ratio is calculated by dividing the proposed quantity of each hazardous substance with the adjusted quantity. The quantity ratios of individual substances are added up for each of the effect types. Total quantity ratios are then compared with defined limits called consent status indices which are listed in Figure 16.7A. If any of the total quantity ratios exceed specified consent status indices, the hazardous facility or sub-facility in question requires a resource consent as either a controlled or discretionary activity.

Some information needs to be assembled at the outset about the hazardous facility and the relevant hazardous substances involved. This includes site layout and location, types of activities as well as the sensitivity of the surrounding environment. In most cases, only a limited number of substances needs to be assessed to determine the resource consent status of a facility. This applies in particular if one, two or three substances are either very hazardous or stored/used in large quantities.

An overview of the HFSP is presented in Figure 16.7B.

**Figure 16.7B: Overview of HFSP**



## 5. Rating Hazardous Substances for the HFSP

To be able to assess any hazardous substance under the HFSP, it must be rated first. These rating criteria are based on the classification system specified by regulations under the Hazardous Substances and New Organisms Act 1996 (HSNO) and are specified in Annex 1 to the Schedule.

For the purposes of the HFSP, each substance is rated on the basis of three effect types:

- **Fire/explosion effects:** concerned with damage to property, the built environment and safety of people.
- **Human health effects:** concerned with the well-being, health and safety of people.
- **Environmental effects:** concerned with damage to ecosystems and natural resources.

Each effect type is divided into a maximum of three hazard levels:

- High
- Medium

- Low

The rating of a hazardous substance for the HFSP requires each substance to be assessed in terms of every hazard category listed in Annex 1. Hazard ratings may be obtained as follows:

- Some commonly used hazardous substances in New Zealand have already been assessed and pre-rated for the HFSP. This information is available from the Council or from the Ministry for the Environment website (<http://www.mfe.govt.nz/about/laws/hsno/hazfacility.htm>).
- Under HSNO, all substances previously controlled by repealed legislation (such as the Dangerous Goods and Toxic Substances Acts) will be classified using HSNO classification criteria. Once a substance is classified under HSNO, it can be rated for the HFSP based on Annex 1. Information on the classification of hazardous substances under HSNO is available from ERMA New Zealand (the Environmental Risk Management Authority) and accessible through the MfE or ERMA websites.

Council will provide a limited list of pesticides with their hazard ratings which have been determined by their aquatic ecotoxicity and their Class 6 packaging groups. This list will be added to as information becomes available. The list is available on the Council’s website, and from the Council.

- Where information for the rating of a hazardous substance for the HFSP is not or only partially available from the above sources, a **precautionary default rating** of ‘medium’ for the fire/explosion and human health effect types, and ‘high’ for the environmental effect type should be applied to the hazardous substance in question.

## 6. Step-by-Step Guide to the HFSP

The total quantity ratio for any hazardous facility or sub-facility [see Chapter 2 definitions] must be calculated by following the steps in Figure 16.7C and Table 1.

To assist with this process, a calculations spreadsheet is provided in Annex 2. This spreadsheet is part of an HFSP calculation spreadsheet package which may be downloaded from the Council website (<http://www.tdc.govt.nz>).

**Figure 16.7C: Step-by-Step Guide to the HFSP**

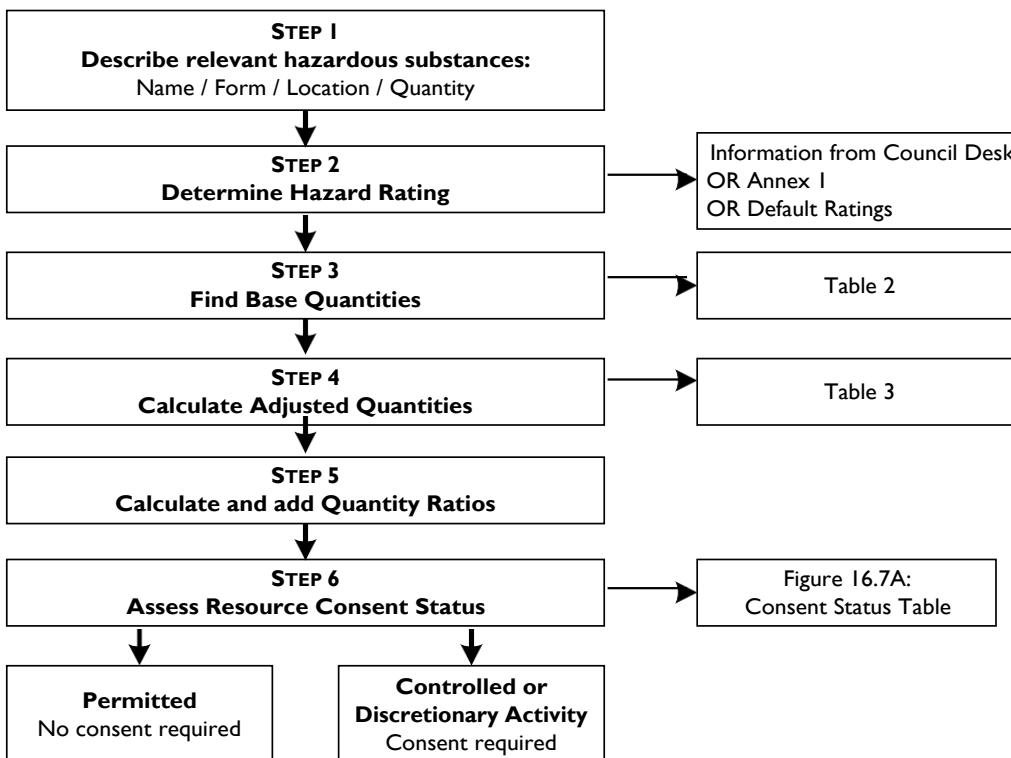


Table 1: HFSP – Step by Step Guide

STEPS	HFSP CALCULATIONS				EXPLANATION
	Substance Name	Substance Form (liquid, solid, gas)	Location of Substances on Site	Proposed Quantity (P) (tonnes or m <sup>3</sup> )	
<p><b>1. Describe the Hazardous Facility</b></p> <p>Prior to using the HFSP, it is necessary to compile a full description of the hazardous facility in question. This includes the creation of an inventory of hazardous substances held on the site, including:</p> <ul style="list-style-type: none"> <li>names of the hazardous substances;</li> <li>quantities of the hazardous substances;</li> <li>the physical form of the substances at 20°C and 101.3 kPa; and</li> <li>the location of use or storage on the site, including separation distances from the site boundary and neighbouring hazardous facilities (on-site and off-site).</li> </ul> <p>The description should also include site-specific details, including neighbouring land uses and the surrounding environment, with a focus on sensitive land uses and receptors (for example, retirement accommodation, aquifers or wetlands).</p>	Substance 1 Substance 2 ..... Substance 10				<p>The HFSP uses standard units of tonnes (for solids, liquids and liquefied gases) and m<sup>3</sup> (for compressed gases). In some cases, it may therefore be necessary to convert substance quantities to these units. In the case of liquids, specific gravity (or density) must be taken into consideration when converting litres or m<sup>3</sup> to tonnes (i.e.</p> $\frac{\text{volume of liquid (litres)} \times \text{specific gravity}}{1000} = \text{tonnes}$ <p>Adjustments to quantities are also necessary where a substance is diluted with water or mixed with another substance. In this instance, only the percentage quantity of the hazardous substance or product in the dilution or mixture is assessed for the purposes of HFSP calculations (unless a mixture is more hazardous than its components, in which case data on the mixture need to be used).</p> <p>An exception to this are products or brands that already constitute dilutions or mixtures of hazardous substances and which have been classified in terms of their hazardous properties as the ‘whole’ dilution or mixture for life cycle management purposes. Examples of this are corrosives, oxidising substances and pesticides, which are often sold commercially as standard solutions or strengths. In these cases, quantity adjustments are only applied when these commercially supplied concentrations are further diluted or mixed.</p>
	<b>EXAMPLE</b>				
		<i>Petrol</i>	<i>Liquid</i>	<i>&lt; 30 metres from site boundary</i>	

STEPS	HFSP CALCULATIONS				EXPLANATION
	Substance Name	Hazard Rating			
Fire/Explosion		Human Health	Environment		
<p><b>2. Determine Hazard Rating</b></p> <p>For the purposes of the HFSP, the effects of substances are categorised into three effect types:</p> <ul style="list-style-type: none"> <li>• Fire/Explosion Effect Type: addressing damage to the built environment and safety of people;</li> <li>• Human Health Effect Type: addressing adverse effects on the well-being, health and safety of people;</li> <li>• Environmental Effect Type: addressing adverse effects on ecosystems and natural resources.</li> </ul> <p>Each effect type is divided into three Hazard Rating Levels:</p> <ul style="list-style-type: none"> <li>• High    • Medium    • Low</li> </ul> <p>The rating levels are predominantly based on the HSNO classification system.</p>	Substance 1 Substance 2 ..... Substance 10	High (H) or Medium (M) or Low (L)	High (H) or Medium (M) or Low (L)	High (H) or Medium (M) or Low (L)	<p>The HFSP rates hazardous substances in terms of each of the three effect types as having a high, medium or low hazard. The hazard rating of a substance is derived from:</p> <ol style="list-style-type: none"> <li>1. The list of HFSP-rated hazardous substances is available from the Ministry for the Environment or Council.</li> <li>2. The HSNO classification (refer Annex 1). Once a substance has been classified under HSNO, Hazard Ratings can be assigned for each effect type as shown in Annex 1.</li> <li>3. Where a substance is neither found in the list of HFSP-rated hazardous substances nor the HSNO databases on the MfE or ERMA websites, default ratings should be used (fire/explosion effect type: <b>Medium</b>; human health effect type: <b>Medium</b>; and environment effect type: <b>High</b>).</li> </ol>
	<i>EXAMPLE</i>				
	<i>Petrol</i>	<i>High</i>	-	<i>High (Default)</i>	
	Substance Name	Base Quantities (B)			
Fire/Explosion		Human Health	Environment		
<p><b>3. Find Base Quantities</b></p> <p>The base quantity (B) is pre-calibrated. It is the amount of a substance that has been assessed as generating no significant off-site effects in a notional heavy industrial area <i>before</i> site and substance-specific considerations have been taken into account (refer Step 4). Base quantities for different hazardous properties and hazard ratings in each effect type are listed in Table 2.</p>	Substance 1 Substance 2 ..... Substance 10	B <sup>1</sup> B <sup>2</sup> ..... B <sup>10</sup>	B <sup>1</sup> B <sup>2</sup> ..... B <sup>10</sup>	B <sup>1</sup> B <sup>2</sup> ..... B <sup>10</sup>	<p>In the example given of petrol, the fire/explosion effect type [sub-category: Flammables] has a base quantity of 10 tonnes for HSNO Class 3A and 3B (<i>see Table 2</i>).</p> <p>Petrol also has an environment effect type hazard rating of High. From Table 2 the base quantity for ecotoxic liquids with a High hazard rating is 1 tonne.</p>
	<i>EXAMPLE</i>				
	<i>Petrol</i>	<i>10 tonnes [Table 2]</i>	-	<i>1 tonne [Table 2]</i>	

STEPS	HFSP CALCULATIONS				EXPLANATION
	Substance Name	Adjusted Quantities (A)			
Fire/Explosion		Human Health	Environment		
<p><b>4. Calculate Adjusted Quantity (A)</b></p> <p>The pre-calibrated adjustment factors (FF, HF, EF) are multiplied with the base quantities (B) to account for substance properties and site-specific environmental circumstances. This multiplication yields the adjusted quantity (A). Adjustment factors differ for each of the effect types, and take into account the following considerations:</p> <ul style="list-style-type: none"> <li>the physical state of the substance;</li> <li>the type of storage;</li> <li>the type of activity or use;</li> <li>separation distances to the site boundary;</li> <li>the environmental sensitivity of the site location.</li> </ul> <p>The adjustment factors are listed in Table 3.</p>	Substance 1 Substance 2 ..... Substance 10	A <sup>1</sup> A <sup>2</sup> ..... A <sup>10</sup>	A <sup>1</sup> A <sup>2</sup> ..... A <sup>10</sup>	A <sup>1</sup> A <sup>2</sup> ..... A <sup>10</sup>	<p>Different adjustment factors are applied for each effect type [see Table 3]. For example, for the fire/explosion effect type, the separation distance to site boundary is relevant; while for the environment effect type, proximity to a water resource is important.</p> <p>In some instances, more than one adjustment factor within each effect type must be applied, which then need to be multiplied with each other to yield the total adjustment factor for the effect type. When the adjustment factors for each effect type have been calculated, they in turn are multiplied with the base quantity to yield the adjusted quantity).</p> <p>In the example given, the following parameters have been assumed:</p> <ul style="list-style-type: none"> <li>&lt;30 to site boundary;</li> <li>not adjacent to water body;</li> <li>underground storage.</li> </ul>
	<b>EXAMPLE</b>				
	<i>Petrol</i>	<i>10 tonnes x 10 = 100 tonnes</i> <i>[From FF3, Table 3]</i>	-	<i>1 tonne x 3 = 3 tonnes</i> <i>[From FE3, Table 3]</i>	



STEPS	HFSP CALCULATIONS				EXPLANATION
	Substance Name	Quantity Ratios (FQ, HQ, EQ)			
Fire/ Explosion		Human Health	Environment		
<p><b>5. Calculate and add Quantity Ratios (FQ, HQ, EQ)</b></p> <p>This step requires the calculation of the quantity ratio for each hazardous substance in question. The quantity ratio is a dimensionless number. It is obtained by dividing the quantity of a substance that is proposed to be used or stored on a site, ie the proposed quantity (P) by the adjusted quantity (A).</p> <p>If several hazardous substances are used or stored on a site, the quantity ratios calculated for each of these substances are added up for each effect type, to yield a total quantity ratio.</p> <p>Note that FQ/HQ/EQ<sub>Total</sub> stands for the total sum of quantity ratio values from all assessed hazardous substances, within each effect type.</p>	Substance 1 Substance 2 ..... Substance 10	FQ <sup>1</sup> FQ <sup>2</sup> ..... FQ <sup>10</sup>  <b>FQ<sub>Total</sub></b>	HQ <sup>1</sup> HQ <sup>2</sup> ..... HQ <sup>10</sup>  <b>HQ<sub>Total</sub></b>	Q <sup>1</sup> Q <sup>2</sup> ..... EQ <sup>10</sup>  <b>EQ<sub>Total</sub></b>	<p>By using the dimensionless ratio of the proposed quantity of a hazardous substance over the adjusted quantity, 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.</p>
	<b>EXAMPLE</b>				
	<i>Petrol</i>	<i>0.50</i> <i>(50 tonnes / 100 tonnes)</i>	-	<i>16.67</i> <i>(50 tonnes / 3 tonnes)</i>	
	Substance Name	Does Quantity Ratio exceed Consent Status Index?			
Fire/ Explosion		Human Health	Environment		
<p><b>6. Assess Resource Consent Status of the Hazardous Facility</b></p> <p>When assessing the resource consent status of a particular hazardous facility or sub-facility, the total quantity ratios for each effect type are compared with relevant consent status indices in the resource consent matrix (Figure 16.7A). If they are exceeded, a resource consent is required.</p>	Substance 1 Substance 2 ..... Substance 10	Yes/No	Yes/No	Yes/No	<p>When examining total quantity ratios against applicable consent status indices, one or several substances may trigger a resource consent. This highlights the fact that when assessing hazardous facilities, it is often sufficient to assess just a few hazardous substances to start off with, mainly those that are either highly hazardous or are used or stored in high quantities.</p> <p>In the petrol example, a resource consent is required because a quantity ratio of 16.67 exceeds 0.75 in Figure 16.7A.</p>
	<b>EXAMPLE</b>				
	In a typical industrial zone:				
	Petrol	No	-	Yes	

**Table 2: Base quantities for All Effects Types and Hazard Levels**

HSNO CATEGORY	UN CLASS EQUIVALENT	HAZARD LEVEL	UNIT	BASE QUANTITY (B)		
				FIRE/ EXPLOSION	HUMAN HEALTH	ENVIRONMENT
<b>Explosiveness</b>						
1.1	Class 1.1	High	tonnes	0.1	-	-
1.2	Class 1.2	Medium	tonnes	1	-	-
1.3	Class 1.3	Low	tonnes	3	-	-
<b>Flammable Gases</b>						
2.1 A+B (LPG)	Class 2.1	Medium	tonnes	30	-	-
2.1 A+B (excluding LPG)	Class 2.1	High	m <sup>3</sup>	10,000*	-	-
<b>Flammable Liquids</b>						
3 A and 3 B	Class 3PGI and 3PGII	High	tonnes	10	-	-
3 C	Class 3PGIII	Medium	tonnes	30	-	-
3 D		Low	tonnes	100	-	-
<b>Flammable Solids</b>						
4.1 (all categories)	Class 4.1	Medium	tonnes	10	-	-
4.2 (all categories)	Class 4.2	High	tonnes	1	-	-
4.3 (all categories)	Class 4.3	High	tonnes	1	-	-
<b>Oxidising Gases, Liquids and Solids</b>						
5.1 (all categories)	Class 5.1	Medium	tonnes (m <sup>3</sup> )	10 (10,000*)	-	-
5.2 (all categories)	Class 5.2	High	tonnes	1	-	-
<b>Toxic Gases, Liquids and Solids</b>						
6.1 A and 6.1 B	Class 6.1 PGI and PGII	High	tonnes	-	0.5	-
6.1 A and 6.1 B	Class 2.3 PGI and PGII	High	m <sup>3</sup>	-	30*	-
6.1 C	Class 6.1 PGIII	Medium	tonnes	-	10	-
6.1 C	Class 2.3 PGIII	Medium	m <sup>3</sup>	-	50*	-
6.7-6.9 (chronic toxicity categories)	OECD	Medium	tonnes	-	10	-
6.1 D		Low	tonnes	-	30	-
6.1 D		Low	m <sup>3</sup>	-	500*	-
<b>Corrosive Gases, Liquids and Solids</b>						
(8A) 6.3-6.4 (corrosives, all categories)	Class 8	Medium	tonnes (m <sup>3</sup> )	-	10	-
<b>Ecotoxic Gases, Liquids and Solids</b>						
9.1A	(OECD 1)	High	tonnes (m <sup>3</sup> )	-	-	1 (30*)
9.1B	(OECD 2)	Medium	tonnes (m <sup>3</sup> )	-	-	30 (50*)
9.1C	(OECD 3)	Low	tonnes (m <sup>3</sup> )	-	-	100 (500*)

\* Base Threshold in m<sup>3</sup> at 101.3 kPa and 20 °C for permanent or compressed gases.

**Table 3: Adjustment Factors**

ADJUSTMENT FACTORS FOR ALL EFFECT TYPES		
Fire/Explosion	Human Health	Environment
<b>FF1: Substance Form</b>	<b>FH1: Substance Form</b>	<b>FE1: Substance Form</b>
Solid = 1	Solid = 3	Solid = 3
Liquid, powder = 1	Liquid, powder = 1	Liquid, powder = 1
Gas (101.3 kPa and 20°C) = 0.1	Gas (101.3 kPa and 20°C) = 0.1	Gas (101.3 kPa and 20°C) = 0.1
<b>FF2: Separation Distance from Site Boundary (sub-facility)</b>	<b>FH2: Separation Distance from Site Boundary (sub-facility) (GASES ONLY)</b>	<b>FE2: Environmental Sensitivity</b>
< 30 metres = 1	< 30 metres = 1	Normal = 1
> 30 metres (>60 metres) <sup>①</sup> = 3	> 30 metres (>60 metres) <sup>①</sup> = 3	< 20 metres from surface water <sup>②</sup> = 0.3
<b>FF3: Type of Activity</b>	<b>FH3: Type of Activity</b>	<b>FE3: Type of Activity</b>
Use = 0.3	Use = 0.3	Use = 0.3
Above ground storage = 1	Above ground storage = 1	Above ground storage = 1
Underground storage <sup>③</sup> = 10	Underground storage <sup>③</sup> = 10	Underground storage <sup>③</sup> = 3
Final Fire/Explosion Adjustment Factor <b>FF = FF1 x FF2 x FF3</b>	Final Human Health Adjustment Factor <b>FH = FH1 x FH2 x FH3</b>	Final Environment Adjustment Factor <b>FE = FE1 x FE2 x FE3</b>
<b>Notes:</b>		
① If the facility is assessed as a sub-facility, the distance to the neighbouring sub-facility must be more than 60 metres (ie 2 x 30 metres) to qualify for an Adjustment Factor of 3.		
② Surface water includes surface water supplies, streams, springs, lakes, wetlands, estuaries and the sea, but does not include entry points to the stormwater drainage network.		
③ Applicable to UN Class 3 substances (flammable liquids) only.		

## Annex 1: HFSP Rating of Hazardous Substances

The full description of HSNO Classes, Sub-classes and Categories is contained in the HSNO Regulations.

HAZARD	HSNO CLASS & CATEGORY	(UN DIVISION)	DESCRIPTION	EFFECT TYPE	HAZARD RATING
<b>Explosiveness</b>	1.1	1.1	Articles and substances having a mass explosion hazard.	Fire/Explosion	<b>High</b>
	1.2	1.2	Articles and substances having a projection hazard, but not a mass explosion hazard.	Fire/Explosion	<b>Medium</b>
	1.3	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: <ul style="list-style-type: none"> <li>• give rise to considerable radiant heat, or</li> <li>• burn one after another, producing minor blast and/or projection effects.</li> </ul>	Fire/Explosion	<b>Low</b>
	1.4, 1.5, 1.6	1.4, 1.5, 1.6	Not applicable.		
<b>Flammable Gases</b>	2.1A, 2.1B	2.1	Flammable gases: <p>(i) gases which at 20°C and a standard pressure of 101.3 kPa:</p> <ul style="list-style-type: none"> <li>• are ignitable when in a mixture of 13% or less by volume with air, or</li> <li>• have a flammable range with air of at least 12% regardless of the lower flammability limit; or,</li> </ul> <p>(ii) gases or gas mixtures, other than those of (i) above, that at 20°C and a standard pressure of 101.3 kPa have a flammable range in mixture in air.</p> <p>Flammable aerosols, being a pressurised mixture of containing gas, compressed, liquified, or dissolved under pressure, with or without a liquid, paste or powder; comprising at least 45 % by mass of flammable ingredients, under a pressure greater than 100 kPa, which can be released in a finely divided spray.</p>	Fire/Explosion	<b>High</b>
	-	LPG	LPG	Fire/Explosion	<b>Medium</b>
		2.2	Not applicable.		
<b>Flammable Liquids</b>			Flammable liquids comprising liquids, mixtures of liquids, or liquids containing solids in suspension which give off a flammable vapour at specific temperatures.		
	3A	3 PGI	Flash point: < 23°C Initial boiling point:: < 35°C	Fire/Explosion	<b>High</b>
	3B	3 PGII	Flash point: < 23°C Initial boiling point:: > 35°C	Fire/Explosion	<b>High</b>

HAZARD	HSNO CLASS & CATEGORY	(UN DIVISION)	DESCRIPTION	EFFECT TYPE	HAZARD RATING
	3C	3 PGIII	(a) Flash point: $\geq 23^{\circ}\text{C}; \leq 60^{\circ}\text{C}$ (b) Flash point: $> 60^{\circ}\text{C}$ , but liquid is manufactured, stored, transported or used (except deliberate burning) at a temperature at or above its flash point.	Fire/Explosion	Medium
	3D	Combustible Liquids	Flash point: $> 60^{\circ}\text{C}$ but $\leq 93^{\circ}\text{C}$	Fire/Explosion	Low
<b>Flammable Solids</b>	4.1 All Categories	4.1	<ul style="list-style-type: none"> <li>Flammable solids that are readily combustible or may cause fire easily through an ignition source or friction.</li> <li>Self-reacting substances that are thermally unstable and are liable to undergo a strongly exothermic decomposition even without the participation of oxygen (and related substances).</li> <li>Desensitised explosives: substances that are wetted with water or alcohol or diluted with other substances to suppress their explosive properties.</li> </ul>	Fire/Explosion	Medium
	4.2 All Categories	4.2	Substances liable to spontaneous combustion: <ul style="list-style-type: none"> <li>pyrophoric substances: liquid or solid substances which, even in small quantities, ignite within 5 minutes of coming in contact with air</li> <li>self-heating substances: solid substances which generate heat when in contact with with air without additional energy supply.</li> </ul>	Fire/Explosion	High
	4.3 All categories	4.3	Substances which, in contact with water, become spontaneously flammable, or emit flammable gases.	Fire/Explosion	High
<b>Oxidising Capacity</b>	5.1 All categories	5.1	Oxidising substances: substances which in themselves are not necessarily combustible, but may cause or contribute to the combustion of other materials by yielding oxygen.	Fire/Explosion	Medium
	5.2 All categories	5.2	Organic peroxides: organic substances that are thermally unstable and may undergo exothermic, self-accelerating decomposition. They may: <ul style="list-style-type: none"> <li>be liable to explosive decomposition,</li> <li>burn rapidly,</li> <li>be sensitive to impact or friction,</li> <li>react dangerously with other substances</li> <li>cause damage to the eyes.</li> </ul>	Fire/Explosion	High

HAZARD	HSNO CLASS & CATEGORY	(UN DIVISION)	DESCRIPTION	EFFECT TYPE	HAZARD RATING
<b>Toxicity</b>		6.1	Substances that are liable to cause death or injury or to harm human health if swallowed, inhaled, or contacted by the skin.		
	6.1B	6.1 PGII	Oral toxicity LD <sub>50</sub> (mg/kg): > 5 - 50 Dermal toxicity LD <sub>50</sub> (mg/kg): > 50 - 200 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): > 0.5 - 1	Human Health	<b>High</b>
	6.1C	6.1 PGIII	Oral toxicity LD <sub>50</sub> (mg/kg): > 50 - 300 Dermal toxicity LD <sub>50</sub> (mg/kg): > 200 - 1,000 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): > 0.5 - 1		<b>Medium</b>
	6.1D	6.1 PGIII	Oral toxicity LD <sub>50</sub> (mg/kg): > 300 - 2,000 Dermal toxicity LD <sub>50</sub> (mg/kg): > 1,000 - 2,000 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): > 1 - 5		<b>Low</b>
		2.3	Toxic gases: gases that are known to be toxic or corrosive to humans and pose a hazard to health. This division is divided into the following categories:		
	6.1A	2.3	a) Inhalation toxicity gases LC <sub>50</sub> : < 100 ppm, vapours LC <sub>50</sub> : < 0.5 mg/l	Human Health	<b>High</b>
	6.1B	2.3	b) Inhalation toxicity gases LC <sub>50</sub> : ≥ 100 ppm - 500 ppm, vapours LC <sub>50</sub> : ≥ 0.5 mg/l - 2 mg/l	Human Health	<b>High</b>
	6.1C	2.3	c) Inhalation toxicity gases LC <sub>50</sub> : ≥ 500 ppm - 2,500 ppm, vapours LC <sub>50</sub> : ≥ 2 mg/l - 10 mg/l	Human Health	<b>Medium</b>
	6.1D	2.3	d) Inhalation toxicity gases LC <sub>50</sub> : ≥ 2,500 ppm - 5,000 ppm, vapours LC <sub>50</sub> : ≥ 10 mg/l - 20 mg/l	Human Health	<b>Low</b>
	(8A) 6.4 All categories	8	Eye Irritation/Corrosiveness: Chemical Property: 2 > pH > 11.5. Effect: Draize Grade ≥ 1 for either corneal opacity or iritis or Grade 2 for either conjunctival redness or chemosis	Human Health	<b>Medium</b>
	(8A) 6.3 All categories	8	Skin Irritation/Corrosiveness: Chemical Property: 2 > pH > 11.5. Effect: Draize Grade ≥ 1.5 for erythema or oedema	Human Health	<b>Medium</b>
	6.4	(OECD 1 & 2)	Respiratory or contact sensitiser.	Human Health	<b>Medium</b>
	6.7A, 6.7B	(OECD 1 & 2)	Carcinogenicity: Suspected or presumed carcinogen.	Human Health	<b>Medium</b>
6.9A, 6.9B	(OECD 1 & 2)	Known, presumed or suspected human target organ toxicity.	Human Health	<b>Medium</b>	

HAZARD	HSNO CLASS & CATEGORY	(UN DIVISION)	DESCRIPTION	EFFECT TYPE	HAZARD RATING
	6.6A, 6.6B	(OECD 1 & 2)	Substances known or regarded as mutagenic OR Substances which cause concern for man owing to the possibility that they may induce heritable mutations in the germ cells of human.	Human Health	<b>Medium</b>
	6.8C	(OECD)	Effects on or via lactation: Data showing (i) a likelihood that the substance would be present in potentially toxic levels in human breast milk; AND/OR (ii) clearly defined adverse effect in the offspring of animals due to transfer in the milk; OR clearly defined adverse effect on the quality of the milk in animals; AND/OR (iii) human evidence indicating a hazard to babies during the lactation period.	Human Health	<b>Medium</b>
		6.2	Not applicable.		
Ecotoxicity			Ecotoxic substances: any substance exhibiting a toxic effect on ecosystems. This division is divided into three categories.		
	9.1A	(OECD1) 9. Marine pollutants	a) Very toxic to the aquatic environment. 96 hr LC <sub>50</sub> salmonid fish <1.0 mg/l 48 hr EC <sub>50</sub> daphnia <1.0 mg/l 72 hr EC <sub>50</sub> algae <1.0 mg/l	Environment	<b>High</b>
	9.1B	(OECD2)	b) Toxic to the aquatic environment. 96 hr LC <sub>50</sub> salmonid fish 1-10 mg/l 48 hr EC <sub>50</sub> daphnia 1-10 mg/l 72 hr EC <sub>50</sub> algae 1-10 mg/l	Environment	<b>Medium</b>
	9.1C	(OECD3)	c) Harmful to the aquatic environment. 96 hr LC <sub>50</sub> salmonid fish 10-100 mg/l 48 hr EC <sub>50</sub> daphnia 10-100 mg/l 72 hr EC <sub>50</sub> algae 10-100 mg/l	Environment	<b>Low</b>

Annex 2: HFSP Calculation Spreadsheets

Enter Site Reference in This Cell <small>Site Details</small>		UN No.	CAS No.	Effects Type & Rating <small>Zones</small>		Base Quantity <small>t</small>	Substance Form <small>Controlled liquid gas</small>	Boundary <30m? <60m? <60m? <60m? <small>Yes/No</small>	< 20 to Surface Water? <small>Yes/No</small>	Activity-Storage Type <small>Quantity Ratio</small>	Adjustment Factors			Product of Adj. Factors	Proposed Quantity Q		Pure Conc. Strong Dilute Weak
											F1	F2	F3		t	m3	
Enter Substances on this site		1	2348	41-32-2	Light Industrial	30.000	liquid	Yes	N/A	0.40	1.0	1.0	1.0	1.0	30.000	0.400	
BUTYL ACRYLATE		1	2348	41-32-2	Fire Medium	30.000	liquid	Yes	N/A	0.40	1.0	1.0	1.0	1.0	30.000	0.400	
UN Class Equivalent: 3 PGIII		1	2348	41-32-2	Health Low	30.000	liquid	Yes	N/A	0.40	1.0	1.0	1.0	1.0	30.000	0.400	
Flammable, Toxic Activity Status		1	2348	41-32-2	Enviro High	1.000	liquid	Yes	N/A	0.40	1.0	1.0	1.0	1.0	1.000	0.400	
!Select from Pull-Down List		2	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
Note: These only apply if no other chemicals on site exceed Total Quantity Ratio for more onerous class of activity.		2	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		3	0	0	Enviro 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
Site Environmental Performance		3	0	0	Health N/A	0.000	N/A				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		4	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
Note: Unless specified in the pull-down list to achieve you will be required to fix the problem rather than apply for a Discretionary Activity Consent.		4	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		5	0	0	Enviro Yes	0.000	0				No Data	No Data	No Data	No Data	No Data		
Confirmed Activity Status		5	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		6	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		6	0	0	Enviro 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		7	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		7	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		7	0	0	Enviro 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		8	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		8	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		8	0	0	Enviro 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		9	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		9	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		9	0	0	Enviro 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		10	0	0	Fire 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		10	0	0	Health 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
!Select from Pull-Down List		10	0	0	Enviro 0	0.000	0				No Data	No Data	No Data	No Data	No Data		
Total Quantity Ratio		0.40															



Site Details		Zones			Consent Status Indices		
Enter Site Reference in This Cell	>30m to Residential Zone Sensitive Use?	Light Industrial		Permitted Activities	Controlled Activities	Discretionary Activities	Total Quantity Ratio
	Yes	Yes	N/A	=<0.5	>0.5	N/A	0.40
Preliminary Activity Status		Permitted Activity					
Prescribed Situations		<p>Note: These only apply if no other chemicals on site exceed Total Quantity Ratio for more onerous class of activity.</p>					
Domestic Quantities Use/Storage Only?		Bulk Storage of <5000 litres Fuel/Oil for Site Use Only?	U/G Storage 5-100m3 Petrol or 5-50m3 Diesel	Use/Store/Dispose Non-Bulk Haz Material Ex Teaching/Research Laboratory?	Use/Storage Radio-active Material <100 TeraBecquerels or exempt under Rad. Prot. Regs?	Use/Storage Radioactive Material >100 TeraBecquerels?	
N/A		N/A	N/A	N/A	N/A	N/A	N/A
Site Environmental Performance		<p>Note: Unless a performance standard is impossible to achieve you will be required to fix the problem rather than apply for a Discretionary Activity Consent.</p>					
This Cell for UST Situations Only	Site Design and Layout OK?	Site Drainage Systems OK?	Spill Containment Systems OK?	Hazardous Facility Signage OK?	Waste Management OK?	Land NOT Subject to Inundation?	
N/A	Yes	Yes	Yes	Yes	Yes	Yes	
Confirmed Activity Status		Permitted Activity			Note: Existing Use as of 26/5/96		

