

Rule 3.2 Hazardous Facilities

Rule Statement

Rules for hazardous facilities are based on controlling the location, design, construction, operation and management of hazardous facilities and sub-facilities in a manner that avoids, remedies or mitigates risks and adverse effects to human health, property and sensitive environments. The Plan achieves this through the use of the Hazardous Facility Screening Procedure (HFSP), which determines the necessary level of scrutiny based on the risk and potential environmental effects presented by hazardous facilities, and through rules based on a series of Minimum Performance Standards.

Rules for radioactive substances are based on controlling the location, design and construction of activities involving radioactive substances in a manner that avoids, remedies or mitigates risks and adverse effects to human health, property and sensitive environments. The Plan achieves this through the use of rules based on the Radiation Protection Regulations 1982 to determine the necessary level of scrutiny based on the risk and potential environmental effects presented by radioactive substances.

Expected Outcome

That people, property and sensitive environments are protected from the potential adverse effects of the use, handling, storage, transport and disposal of hazardous, including radioactive, substances and that hazardous facilities and sub-facilities are developed and operated in a manner which minimises the risk of an accidental release, or loss of control of hazardous substances.

Means of Compliance

The following rules shall be read in conjunction with the standards and performance assessments in the relevant zone, and all other rules within the Plan.

The activity status and standards in this rule may be modified by Overlay Rules in [Rule Section 2.0](#).

The activity status of a Permitted or Controlled Activity may be altered from the activity list below where the activity cannot meet one or more of the standards in this rule. For clarification of activity status, see [Rule 3.2.4](#) - Failure to Meet Standards.

Regard must be had to all Objectives and Policies which may be relevant to any proposed activity subject to this Rule. This includes, but shall not be limited to, Policy Section 6.6 Hazardous Substances.

3.2.1 Activities

a) Permitted Activities

The following activities are Permitted Activities provided they comply with the standards in Rule 3.2.2 and the relevant standards in Rule 3.2.3:

- Any hazardous facility or sub-facility which has been assessed as having a Quantity Ratio which is below or equal to the Consent Status Indices for Permitted Activities in the Consent Status Matrix (Refer Appendix 3.2-1)
- Any use or storage of radioactive materials with an activity below that specified as an exempt activity in the Radiation Protection Regulations 1982
- Radioactivity arising from smoke detectors.

b) Controlled Activities

The following activities are Controlled Activities provided they comply with the standards in Rule 3.2.2 and the relevant standards of Rule 3.2.3 and will be controlled in respect of the matters identified:

- Retailing of petrol (up to 100,000 litres in underground tanks) and diesel (up to 50,000 litres in underground tanks), and LPG gas (up to 6 tonnes/single vessel per site) unless otherwise stated in the respective zones
 - with respect to the design, installation and operation of underground storage facilities for petroleum products; LPG gas storage and handling; transport of hazardous materials; emergency and spill contingency plans
- Teaching and research laboratories and the associated use, handling, storage and disposal of hazardous substances unless otherwise stated in the respective zones
 - with respect to construction of laboratories; safety in laboratories; procedures to minimise the use and storage of hazardous substances (especially flammables) inside laboratories to quantities which are reasonably required to undertake teaching and research activities; procedures to store excess hazardous substances in purpose-built facilities; a management plan for hazardous wastes; an emergency plan which systematically outlines the hazards in the laboratory and the action to be taken in emergencies; a register of incidents and accidents.

c) Restricted Discretionary Activities

The following activities are Restricted Discretionary Activities.

- Any hazardous facility or sub-facility which has been assessed as having a Quantity Ratio which is within the Consent Status Indices for Restricted Discretionary Activities in the Consent Status Matrix (Refer Appendix 3.2-1) with discretion restricted to:
 - the extent to which the activity meets relevant zone performance standards under this Plan; the extent to which the activity complies with the objectives and policies of this Section and the relevant zone in this Plan; whether the activity complies with the Standards of Rule 3.2.2 and Rule 3.2.3; the extent to which the risks presented by the

proposal to humans, the environment and property are able to be avoided, remedied or mitigated.

d) Discretionary Activities

The following activities are Discretionary Activities.

- Any hazardous facility or sub-facility which has been assessed as having a Quantity Ratio which is above the Consent Status Indices for Discretionary Activities in the Consent Status Matrix (Refer Appendix 3.2-I)
- Any use or storage of radioactive materials with an activity in excess of that specified as an exempt activity in the Radiation Protection Regulations 1982 and below or equal to 1,000 terabecquerel (1×10^{15}).

e) Non-Complying Activities

The following activities are Non-Complying Activities.

- Any facility using radioactive material with an activity in excess of 1,000 terabecquerel (1×10^{15}).

3.2.2 Standards

a) Quantity Ratios and Exemptions

The Quantity Ratios for any hazardous facility or sub-facility shall be assessed under the Hazardous Facility Screening Procedure as set out in Appendix 3.2-II. The following activities will be exempt from this requirement but not from any other requirements relating to hazardous substances:

- The storage of fuels for retail sale purposes (up to 100,000 litres of petrol and 50,000 litres of diesel in underground storage tanks and up to 6 tonnes of LPG in an above ground tank)
- Teaching and research laboratories provided that the exemption for teaching and research laboratories shall not apply to any other activities involving hazardous substances undertaken by teaching and research institutions.

b) Assessment of Environmental Effects

Applications for Restricted Discretionary and Discretionary Activities shall be accompanied by an Assessment of Environmental Effects (AEE) pursuant to the Fourth Schedule of the RMA. The AEE must be appropriate to the nature and the scale of the proposed facility or sub-facility and its associated actual or potential environmental effects, and must address the matters listed in Appendix 3.2-III.

For any Discretionary Activity the AEE must also contain a risk assessment that systematically addresses site hazards, likely accident scenarios, exposure pathways, receiving environments and potential environmental effects.

ADVISORY NOTE:

In addition to the provisions of this Plan's rules for hazardous substances, the following provisions for hazardous substances must also be adhered to:

- *Relevant rules and provisions of a Regional Plan or the Regional Policy Statement*
- *Transitional and future regulations for hazardous substances under the Hazardous Substances and New Organisms Act 1996*
- *The Radiation Protection Act 1965 and associated regulations*
- *The Land Transport Act 1962 and the relevant NZ Standard for the land transport of hazardous substances.*

3.2.3 Standards

The following general standards apply to all activities.

a) Hazardous Facilities Site Design

Any part of a hazardous facility or sub-facility which is involved in the manufacture, mixing, packaging, storage, loading, unloading, transfer, usage or handling of hazardous substances shall be designed, constructed and operated in a manner that prevents:

- i) Any adverse effects of the intended activity from occurring outside of the site unless permitted by a resource consent
- ii) The entry or discharge of the hazardous substance into the stormwater drainage or a municipal sewerage system unless permitted by a network utility operator
- iii) The contamination of air, land and/or water (including groundwater and potable water supplies and surface waters) in the event of a spill or other unintentional release of hazardous substances.

b) Hazardous Facilities Spill Containment Systems

Any spill containment system shall be:

- i) Constructed from impervious materials resistant to the hazardous substances concerned
- ii) Able to contain the maximum volume of the largest tank used, or where drums or other containers are used, able to contain half of the maximum volume of substances stored
- iii) Able to prevent any spill or other unintentional release of hazardous substances, and any stormwater and/or fire water that has become contaminated, from entering the stormwater drainage system
- iv) Able to prevent any spill or other unintentional release of hazardous substances, and any stormwater and/or fire water 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
- v) Managed so that all stormwater grates on the site are clearly labelled "Stormwater Only".

c) Hazardous Facilities Wash-Down Areas

Any part of the hazardous facility or sub-facility 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) Entry or discharge into the sewerage system unless permitted by the sewerage utility operator
- iii) Discharge into or onto land and/or water (including groundwater and potable water supplies) unless permitted by a resource consent.

d) Hazardous Facilities Underground Storage Tanks

Underground tanks used for hazardous substances, unless permitted by a resource consent, shall be designed, installed and managed to prevent leakage and spills. Underground storage tanks shall be:

- i) Constructed from impervious materials resistant to the hazardous substances to be stored
- ii) Equipped with secondary containment facilities in areas of environmental sensitivity
- iii) Serviced by a leak detection or monitoring system which is capable of detecting a failure or breach in the structural integrity in the primary containment vessel.

e) Hazardous Facilities Signage

Hazardous facilities and sub-facilities shall be adequately signposted to indicate the nature of hazardous substances stored or used or otherwise handled.

ADVISORY NOTE:

Compliance can be achieved by adherence to the Code of Practice for "Warning Signs for Premises Storing Hazardous Substances" of the New Zealand Chemical Industry Council (1988), HAZCHEM signage system, or any other Code of Practice approved by the New Zealand Fire Service.

f) Hazardous Facilities Waste Management

Any process waste or waste containing hazardous substances shall be managed in accordance with Rule 3.2.3 a) and Rule 3.2.3 b). The storage of any waste containing hazardous substances shall be in a manner that prevents:

- i) Exposure to ignition sources
- ii) the corrosion or alteration of containment facilities and materials used for the storage of the waste
- iii) the unintentional release of the waste
- iv) Any hazardous facility or sub-facility generating waste containing hazardous substances shall dispose of these wastes to authorised facilities, or be serviced by an acceptable waste contractor.

ADVISORY NOTE:

In the evaluation of the above matters, Council will deem the following documents or any subsequent amendment to these documents, an acceptable means of compliance:

- *Code of Practice for 'Warning Signs for Premises Storing Hazardous Substances' of the New Zealand Chemical Industry Council (1988), HAZCHEM signage system, or any other Code of Practice approved by the New Zealand Fire Service.*
- *Code of Practice for the 'Operation of Underground Petroleum Storage Systems' by the New Zealand Department of Labour.*

3.2.4 Failure to Meet Standards

Activities which do not comply with one or more standards in [Rule 3.2.2](#) or [Rule 3.2.3](#) are **Restricted Discretionary Activities**, with discretion restricted to the subject matter of the standard that can not be met.

Performance Assessment

In determining any resource consent, Council shall have regard to the expected outcome for this rule and the relevant underlying zone, to any related objectives and policies, and to the following.

3.2.5 Performance Outcomes - Controlled Activities

In assessing a resource consent for a Controlled Activity, Council can impose conditions on the following matters.

a) Retailing of Petrol, Diesel and LPG

- i) Activities shall be in compliance with Performance Standards in [Rule 3.2.3](#).
- ii) Activities shall comply with acceptable Codes of Practice for the design, installation and operation of storage facilities for petrol and LPG.
- iii) Activities shall demonstrate safe routes have been selected and will be utilised for the transportation of hazardous materials to and from the site.
- iv) Emergency and contingency plans shall be prepared for the site.

ADVISORY NOTE:

The following standards and codes of practice and any subsequent amendments to these documents will be deemed to constitute an acceptable means of compliance with matters over which the Council reserves its controls:

- *The Code of Practice for the 'Design, Installation and Operation of Underground Petroleum Systems' (Department of Labour, OSH, 1992)*
- *The Australian/New Zealand Standard AS 1596:1997 – Storage and Handling of LP Gas*

b) Teaching and Research Laboratories

- i) Activities shall be in compliance with Performance Standards in Rule 3.2.3
- ii) Activities shall comply with acceptable Codes of Practice for the design and operation of teaching and research laboratories and for the storage and handling of hazardous substances.
- iii) Emergency and contingency plans shall be prepared for the site.
- iv) The management of waste hazardous substances shall be undertaken in a manner which avoids, remedies or mitigates adverse effects on people, property and sensitive environments.

ADVISORY NOTE:

The following standards and codes of practice and any subsequent amendments to these documents, will be deemed to constitute an acceptable means of compliance with matters over which Council reserves its controls:

<i>AS 2982.1: 1997</i>	<i>Laboratory Design and Construction</i>
<i>AS 2243.1: 1997</i>	<i>Safety in Laboratories – General</i>
<i>AS 2243.2: 1997</i>	<i>Safety in Laboratories – Chemical Aspects</i>
<i>AS 2243.3: 1995</i>	<i>Safety in Laboratories – Microbiology</i>
<i>S 2243.5: 1993</i>	<i>Safety in Laboratories – Non-ionising radiation</i>
<i>AS 2243.6: 1990</i>	<i>Safety in Laboratories – Mechanical Aspects</i>
<i>AS 2243.8: 2001</i>	<i>Safety in Laboratories – Fume Cupboards</i>
<i>AS 2243.9: 1991</i>	<i>Safety in Laboratories – Recirculating Fume Cabinets</i>
<i>AS 2243.10: 1993</i>	<i>Safety in Laboratories – Storage of Chemicals.</i>

3.2.6 Assessment Criteria – Restricted Discretionary and Discretionary Activities

Restricted Discretionary Activities, as defined by [Rule 3.2.4](#) will be assessed only in respect of the subject matter of the standard with which the activity was unable to comply.

Restricted Discretionary Activities, as defined by the Consent Status Matrix (Appendix 3.2 –I) will be assessed only in respect of the subject matter specified in [Rule 3.2.1 c](#)).

Discretionary Activities will be assessed against, but not limited to, the assessment criteria below.

a) Assessment of Environmental Effects

Any proposal will be assessed in respect of the Assessment of Environmental Effects prepared under Appendix 3.2-III.

b) Hazardous Facilities

In assessing Discretionary Activities Council will evaluate the following additional matters:

- i) Whether the proposal complies with the Performance Standards outlined in [Rule 3.2.3](#)
- ii) The extent to which the proposed site design, construction and operation of hazardous facilities and sub-facilities are appropriate to prevent the accidental release, or loss of control, of hazardous substances.
- iii) The extent to which the proposed site design, construction and operation of hazardous facilities and sub-facilities are appropriate to prevent and mitigate any adverse effects resulting from activities on the site involving hazardous substances on people, property and environmentally sensitive areas.
- iv) The preparation of waste management plans for significant quantities of wastes containing hazardous substances, including procedures for disposal practices and use of waste contractors.
- v) Whether other alternatives have been considered.
- vi) Whether the risks presented by the hazardous facility or sub-facility to humans, the environment and property have been assessed fully and systematically, and whether they are able to be avoided, remedied and mitigated satisfactorily.
- vii) Whether a suitable site management system has been proposed.

ADVISORY NOTE:

The Council will accept the use of a national or international site management standard and any subsequent amendments to these standards, such as the New Zealand Chemical Industry Council (NZCIC) Responsible Care Programme, the ISO 9000 and ISO 14001 systems.

c) Radioactive Substances

Any proposal involving the use of radioactive materials will be assessed against the following:

- i) The extent to which site design and construction are appropriate to prevent the accidental release, or loss of control, of radioactive substances.
- ii) The extent to which risks presented by activities on the site involving radioactive substances and associated potential adverse effects on people, property and environmentally sensitive areas resulting from an accidental release, or loss of control, of radioactive substances have been adequately considered.
- iii) Whether adequate emergency and contingency measures are proposed which are able to remedy or mitigate any adverse environmental effects associated with accidental release, or loss of control, of radioactive substances.

Appendix 3.2-I Hazardous Facilities – Consent Status Matrix

ZONE/OVERLAY	ACTIVITY STATUS / CONSENTS STATUS INDICES		
	Permitted	Restricted Discretionary	Discretionary
RESIDENTIAL	≤ 0.02	-	> 0.02
Environmental Protection Overlay (all zones)			
RESIDENTIAL Visitor Facilities Area	≤ 0.05	-	> 0.05
RECREATION ENVIRONMENT			
SUBURBAN CENTRE	≤ 0.1	>0.1 - 0.2	>0.2
CITY CENTRE			
COMMERCIAL SERVICE Special Amenity Area			
RECREATION GENERAL	≤ 0.2	> 0.2 - 0.4	> 0.4
RECREATION MAJOR			
COMMUNITY FACILITY			
INDUSTRIAL Amenity Protection Area			
SUBURBAN CENTRE Vehicle Service Area	≤ 0.4	> 0.4 - 0.8	> 0.8
COMMERCIAL SERVICE	≤ 0.2 (if within 30 m of a Residential Zone)	> 0.2 - 0.4 (if within 30 m of a Residential Zone)	> 0.4 (if within 30 m of a Residential Zone)
INDUSTRIAL	≤ 0.75	> 0.75 - 1.5	> 1.5
FUTURE URBAN	≤ 1.0 (if >100 m from zone boundary)	>1 - 2 (if >100 m from zone boundary)	>2.0 (if >100 m from zone boundary)
MAJOR FACILITY	≤ 0.2 (if within 30 m of a Residential Zone)	>0.2 - 0.4 (if within 30 m of a Residential Zone)	> 0.4 (if within 30 m of a Residential Zone)
Heritage Precinct Overlay (as per zones)			
Designations (as per zones unless specified)			

Appendix 3.2-II Hazardous Facilities Screening Procedure

1. Background

The HFSP is applied to hazardous facilities in all land use zones and in addition to other zone-specific land use controls. The procedure is applied to all new hazardous facilities, irrelevant of their type and size. The HFSP should also be applied to existing hazardous facilities if a significant change occurs in the character, nature and scale of effects.

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 may be dealt with as separate facilities and the HFSP is applied to each of them separately.

2. Terminology

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

Term	Explanation
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 substances proposed to be used or stored on a site.
Base Quantity (B)	Pre-calibrated quantity of a hazardous substance that is deemed to be acceptable on a heavy industrial site without causing any significant off-site effects.
Adjustment Factor	Pre-calibrated factors that take into account substance, storage and site-specific circumstances.
Adjusted Quantity (A)	Equivalent to the Base Quantity that has been adjusted using Adjustment Factors.
Effect Type	Three Effect Types are used by the HFSP: <ul style="list-style-type: none"> • Fire/explosion • Effects on human health • Effects on the environment.
Quantity Ratio (Q)	The ratio of the proposed quantity of a substance over the applicable Base Quantity.
Consent Status Index	Numerical values in the district plan that are used to determine the consent status of a facility.

3. Overview

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
- environment.

Basically, 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. Cumulative Quantity Ratios are then compared with defined limits called Consent Status Indices which are listed in the rules of the District Plan. If any of the Quantity Ratios exceed specified Consent Status Indices, the hazardous facility in question requires a resource consent.

Some information needs to be assembled at the outset about the hazards of the substances concerned. 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 an activity. 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 1.

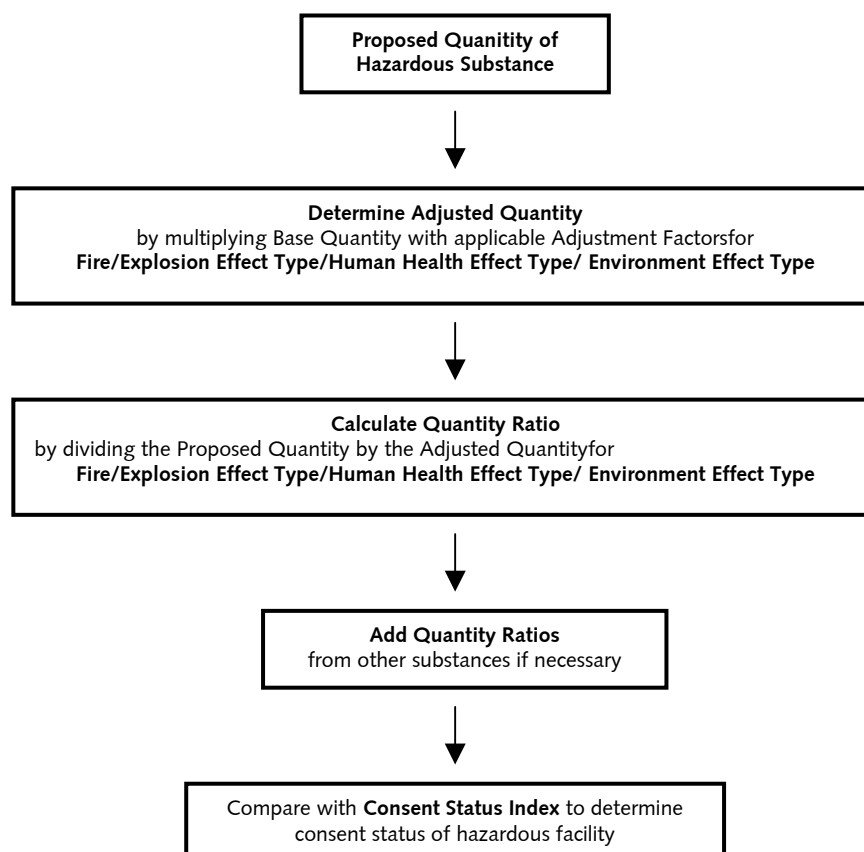


Figure 1 Overview of HFSP (process for single substance)

4. Rating hazardous substances for the HFSP

To be able to assess hazardous substances under the HFSP, they 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 Appendix A.

For the purposes of the HFSP, each substance is rated based on 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:

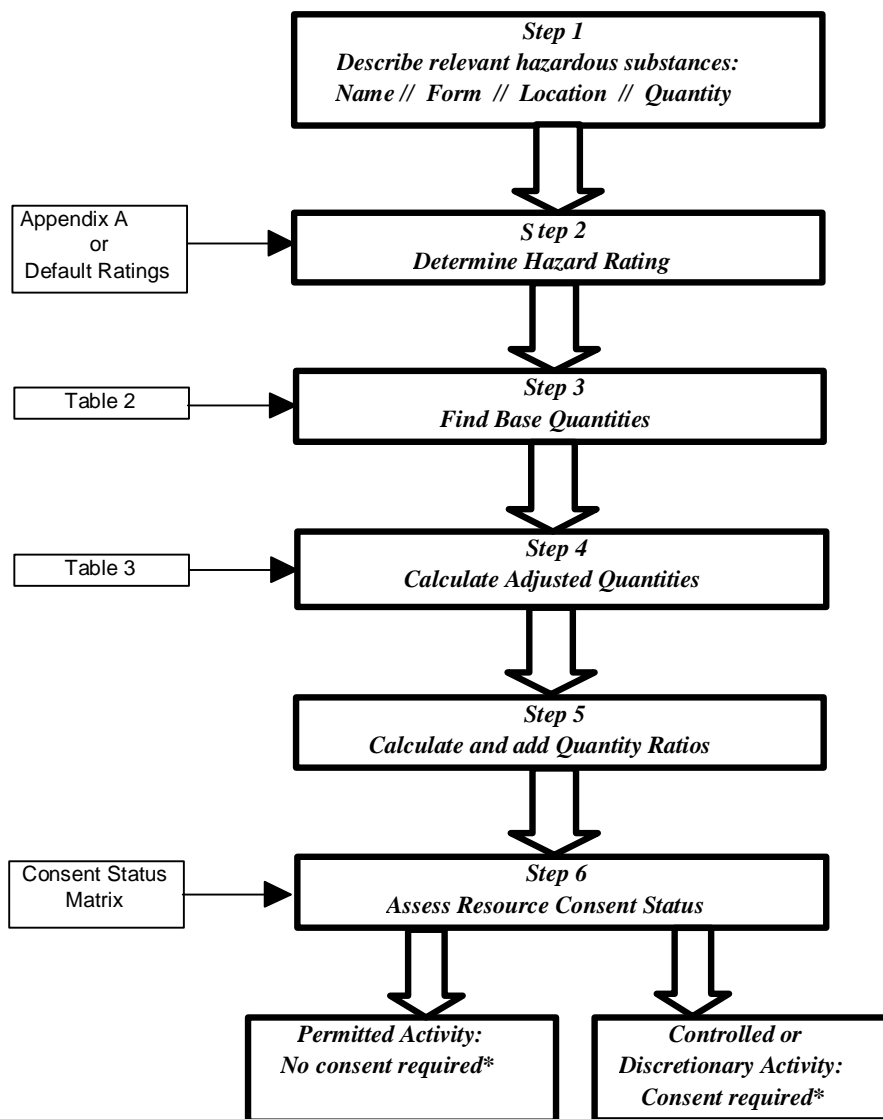
- ◆ high; ◆ medium; ◆ low.

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

- i) 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 desk or from the Ministry for the Environment website.
- ii) 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 easily rated for the HFSP based on Appendix A. Information on the classification of hazardous substances under HSNO will be available from ERMA New Zealand (the Environmental Risk Management Authority) and be accessible through the MfE/ERMA websites.
- iii) Where information for the rating of a hazardous substance for the HFSP is not or only partially available from the above discussed 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.
- iv) Where no HFSP rating is available through Options i) or ii) above and the default ratings given in Option iii) are not considered suitable, the Rating Guide in Appendix C of the "Land Use Planning Guide for Hazardous Facilities" may be used to research and assign HFSP ratings to hazardous substances.

5. Step-by-step guide to the HFSP

This section works through a step-by-step guide on how to use the Hazardous Facility Screening Procedure, following the steps shown in Figure 2 and Table 1 (A spreadsheet for calculations can be found in Appendix B).



*NOTE: Compliance with minimum performance standards is always required

Figure 2 Step-by-step guide to the HFSP

Table 1: HFSP – Step-by-Step Guide

Steps	HFSP calculations				Explanation
<p>1 Describe the hazardous facility</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"> names of the hazardous substances quantities of the hazardous substances the physical form of the substances at 20°C and 101.3 kPa 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). <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 (e.g. retirement accommodation, aquifers or wetlands).</p>	<p>Substance name</p> <p>Substance 1 Substance 2 ... Substance 10</p>	<p>Substance form</p> <p>(liquid, solid, gas)</p>	<p>Location of substances on site</p>	<p>Proposed quantity (P)</p> <p>(tonnes or m³)</p>	<p>The HFSP uses standard units of tonnes (t) (for solids, liquids and liquefied gases) and cubic metres (m³) (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 m³ 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>
	<p>Petrol</p>	<p>Liquid</p>	<p>Example</p> <p><30 metres</p>	<p>50+</p>	
<p>2 Determine hazard rating</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"> Fire/Explosion Effect Type: addressing damage to the built environment and safety of people Human Health Effect Type: addressing adverse effects on the well-being, health and safety of people Environmental Effect Type: addressing adverse effects on ecosystems and natural resources. <p>Each Effect Type is divided into three Hazard Rating Levels:</p> <ul style="list-style-type: none"> High • Medium • Low <p>The rating levels are based predominantly on the HSNO classification system.</p>	<p>Substance name</p> <p>Substance 1 Substance 2 ... Substance 10</p>	<p>Hazard rating</p>			<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"> The list of HFSP-rated hazardous substances in Appendix B¹. The HSNO classification (refer Appendix A). Once a substance has been classified under HSNO, Hazard Ratings can be assigned for each Effect Type as shown in Appendix A. Where a substance is neither found in Appendix B¹ nor the HSNO database on the ERMA website, the following default ratings should be used: <ul style="list-style-type: none"> Fire/Explosion Effect Type: Medium Human Health Effect Type: Medium Environment Effect Type: High The substance may be rated using Appendix C² as a guide.
	<p>Petrol</p>	<p>Example</p> <p>High</p>	<p>Low</p>	<p>Medium</p>	
<p>3 Find base quantities</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 heavy industrial area before 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>	<p>Substance name</p> <p>Substance 1 Substance 2 ... Substance 10</p>	<p>Base quantities (B)</p>			<p>For example, in the Fire/Explosion Effect Type (Sub-category Flammables), non-significant off-site effects in a heavy industrial area are represented by a Base Quantity of:</p> <ul style="list-style-type: none"> 100 tonnes of a HSNO Category D flammable liquid which has a low hazard level for the Fire/Explosion Effect Type. 30 tonnes of a HSNO Category C flammable liquid which has a medium hazard level for the Fire/Explosion Effect Type.
	<p>Petrol</p>	<p>Example</p> <p>10 t</p>	<p>30 t</p>	<p>30 t</p>	

1 Refers to Appendix B Hazardous Substance Hazard Ratings of the "Land Use Planning Guide for Hazardous Facilities" by the Hazardous Facilities Screening Procedure Review Group in conjunction with the Ministry for the Environment, February 2002.

- 2 Refers to Appendix C Rating Guide of the "Land Use Planning Guide for Hazardous Facilities" by the Hazardous Facilities Screening Procedure Review Group in conjunction with the Ministry for the Environment, February 2002.

Steps	HFSP calculations			Explanation	
<p>4 Calculate Adjusted Quantity (A)</p> <p>The precalibrated 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).</p> <p>Adjustment Factors differ for each of the Effect Types, and take into account the following considerations:</p> <ul style="list-style-type: none"> the physical state of the substance the type of storage the type of activity or use separation distances to the site boundary the environmental sensitivity of the site location. <p>The Adjustment Factors are listed in Table 3.</p>	<p>Substance name</p> <p>Substance 1</p> <p>Substance 2</p> <p>...</p> <p>Substance 10</p>	Adjusted quantities (A)			<p>Different Adjustment Factors are applied for each Effect Type. For example, for the Fire/Explosion Effect Type, the temperature is relevant, while for the Human Health Effect Type, proximity to a potable 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"> <30m to site boundary not adjacent to water body underground storage.
		<p>Substance 1</p> <p>Fire/Explosion</p> <p>A₁</p> <p>Substance 2</p> <p>A₂</p> <p>....</p> <p>A₁₀</p>	<p>Human Health</p> <p>A₁</p> <p>A₂</p> <p>....</p> <p>A₁₀</p>	<p>Environment</p> <p>A₁</p> <p>A₂</p> <p>....</p> <p>A₁₀</p>	
Example					
	<p>Petrol</p> <p>100 t (10 tonnes x 10)</p>	<p>300 t (30 tonnes x 30)</p>	<p>90 t (30 tonnes x 3)</p>		
<p>5 Calculate and add Quantity Ratios (FQ, HQ, EQ)</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, i.e. 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.</p> <p>Note that FQ/HQ/EQ_{Total} stands for the total sum of Quantity Ratio values from all assessed hazardous substances, within each Effect Type.</p>	<p>Substance name</p> <p>Substance 1</p> <p>Substance 2</p> <p>...</p> <p>Substance 10</p>	Quantity ratios (FQ, HQ, EQ)			<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>
		<p>Substance 1</p> <p>Fire/Explosion</p> <p>FQ₁</p> <p>Substance 2</p> <p>FQ₂</p> <p>....</p> <p>FQ₁₀</p> <p>FQ_{Total}</p>	<p>Human Health</p> <p>FQ₁</p> <p>FQ₂</p> <p>....</p> <p>FQ₁₀</p> <p>HQ_{Total}</p>	<p>Environment</p> <p>FQ₁</p> <p>FQ₂</p> <p>....</p> <p>FQ₁₀</p> <p>EQ_{Total}</p>	
Example					
	<p>Petrol</p> <p>0.50 (50 tonnes / 100 tonnes)</p>	<p>0.1667 (50 tonnes / 300 tonnes)</p>	<p>0.5556 (50 tonnes / 90 tonnes)</p>		
<p>6 Assess resource consent status of hazardous facility</p> <p>When assessing the resource consent status of a particular hazardous facility, the added Quantity Ratios for each Effect Type are compared with relevant Consent Status Indices in the Resource Consent Matrix in the district plan. If they are exceeded, a resource consent is required.</p>	<p>Substance name</p> <p>Substance 1</p> <p>Substance 2</p> <p>...</p> <p>Substance 10</p>	Does quantity ratio exceed consent status index?			<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/stored in high quantities.</p>
		<p>Substance 1</p> <p>Fire/Explosion</p> <p>Yes/No</p> <p>Substance 2</p> <p>Yes/No</p> <p>....</p> <p>Substance 10</p> <p>Yes/No</p>	<p>Human Health</p> <p>Yes/No</p>	<p>Environment</p> <p>Yes/No</p>	
Example					
In a typical industrial zone:					
	<p>Petrol</p> <p>No</p>	<p>No</p>	<p>No</p>		

Table 2: Base Quantities (B) for all Effect Types and Hazard Ratings

HSNO category	UN class equivalent	Hazard level	Unit tonnes or cubic metres	Base Quantity (B)		
				Fire/explosion	Human health	Environment
Explosive substances						
1.1	1.1	High	tonnes	0.1	–	–
1.2	1.2	Medium	tonnes	1	–	–
1.3	1.3	Low	tonnes	3	–	–
1.5	1.5	Low	tonnes	3	–	–
Flammable gases						
2.1.1A	2.1	High	m ³	10,000*	–	–
2.1.2A	2.1	High	tonnes	10	–	–
			m ³	10,000*	–	–
			tonnes	10	–	–
	LPG	Medium	tonnes	30	–	–
Flammable liquids						
3.1 A	3PGI	High	tonnes	10	–	–
3.1 B	3PGII	High	tonnes	10	–	–
3.1 C	3PGIII	Medium	tonnes	30	–	–
3.1 D	Combustible liquids	Low	tonnes	100	–	–
Liquid desensitized explosives						
3.2 A	3 PGI	High	tonnes	1		
3.2 B	3 PGII					
3.2 C	3 PGIII					
Flammable solids						
4.1.1.A	4.1 (a) PGII	Medium	tonnes	10	–	–
4.1.1 B	4.1 (a) PGIII	Low	tonnes	30	–	–
4.1.2 A	4.1 (b) PGII	High	tonnes	1	–	–
4.1.2 B						
4.1.2 C	4.1 (b) PGII	Medium	tonnes	10	–	–
4.1.2 D						
4.1.2 E	4.1 (b) PGII	Low	tonnes	30	–	–
4.1.2 F						
4.1.2 G						
4.1.3 A	4.1 (c) PGI	High	tonnes	1	–	–
4.1.3 B	4.1 (c) PGII	High	tonnes	1	–	–
4.1.3 C	4.1 (c) PGIII	High	tonnes	1	–	–
4.2 A	4.2 PGI	High	tonnes	1	–	–
4.2 B	4.2 PGII	High	tonnes	1	–	–
4.2 C	4.2 PGIII	Medium	tonnes	10	–	–
4.3 A	4.3 PGI	High	tonnes	1	–	–
4.3 B	4.3 PGII	High	tonnes	1	–	–
4.3 C	4.3 PGIII	Medium	tonnes	10	–	–
Oxidising substances						
5.1.1 A	5.1 PGI	High	tonnes	1		
5.1.1 B	5.1 PGII	High	tonnes	1		
5.1.1 C	5.1 PGIII	Medium	tonnes	10		
5.1.2 A	2.2	High	m ³	10,000		
			tonnes	10		
5.2 A	5.2	High	tonnes	1		
5.2 B	Types A & B					
5.2 C	5.2	Medium	tonnes	10		
5.2 D	Types C & D					
5.2 E	5.2	Low	tonnes	30		
5.2 F	Types E, F & G					
5.2 G						

Toxic substances						
6.1 A	6.1 PGI 2.3	High	tonnes m ³	–	1 50	–
6.1 B	6.1 PGII 2.3	High	tonnes m ³	–	1 50	–
6.1 C	6.1 PGIII 2.3	Medium	tonnes m ³	–	10 150	–
6.1 D	Standard poison	Low	tonnes m ³	–	30 500	–
Corrosive substances						
8.2 A	8 PGI	High	tonnes	–	1	–
8.2 B	8 PGII	Medium	tonnes	–	10	–
8.2 C	8 PGIII	Low	tonnes	–	30	–
Ecotoxic substances						
9.1 A	GHS	High	tonnes	–	–	3
9.1 B	GHS	Medium	tonnes	–	–	30
9.1 C	GHS	Low	tonnes	–	–	100
9.1 D	GHS	Low	tonnes	–	–	100

* Base threshold in m³ at 101.3 kPa and 20°C for permanent or compressed gases.

Table 3: Adjustment Factors for All Effect Types

Fire/explosion	Human health	Environment
FF1: Substance form	FH1: Substance form	FE1: Substance form
Solid = 1	Solid = 3	Solid = 3
Liquid, powder = 1	Liquid, powder = 1	Liquid, powder = 1
Gas (101.3kPa & 20°C) = 0.1	Gas (101.3 kPa and 20°C) = 0.1	Gas (101.3 kPa and 20°C) = 0.1
FF2: Separation distance from site boundary (sub-facility)	FH2: Separation distance from site boundary (sub-facility) (gases only)	FE2: Environmental sensitivity
< 30 m = 1	< 30 m = 1	Normal = 1
> 30 m (>60 m) ¹ = 3	> 30 m (>60 m) ² = 3	Adjacent to water resource ² = 0.3
FF3: Type of activity	FH3: Type of activity	FE3: Type of activity
Use = 0.3	Use = 0.3	Use = 0.3
Above ground storage = 1	Above ground storage = 1	Above ground storage = 1
Underground storage ³ = 10	Underground storage ³ = 10	[Underground storage ³ = 3]
Final fire/explosion adjustment factor FF = FF1 x FF2 x FF3	Final human health adjustment factor FH = FH1 x FH2 x FH3	Final environment adjustment factor FE = FE1 x FE2 x FE3

- 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 (refer Section 5.5.4 of the "Land Use Planning Guide for Hazardous Facilities" by the Hazardous Facilities Screening Procedure Review Group in conjunction with the Ministry for the Environment, February 2002).
- 2 Water resources include aquifers and water supplies, streams, springs, lakes, wetlands, estuaries and the sea, but do not include entry points to the stormwater drainage network.
- 3 Applicable to UN Class 3 substances (flammable liquids) only.

Appendix A: HFSP Rating for Hazardous Substances

The full description of HSNO classes, sub-classes and categories as well as explanations of terms used is contained in the Regulations to the Hazardous Substances and New Organisms Act 1996. Further details on their use may also be found in the ERMA "Users Guide to the HSNO Thresholds and Classifications of Hazardous Substances."

It is important to note that:

- HSNO classes and categories do not always correspond perfectly with the UN Classification. The list provided in this Appendix should therefore only be used for HFSP purposes.
- A number of HSNO classes or sub-classes do not have an HFSP rating in the land use planning context as the potential for off-site effect of these substances is low.

Hazard	HSNO Class and Category	(UN Division)	Description	Effect type	Hazard rating
Explosive substances	1.1	1.1	Substances and articles that have a mass explosion hazard.	Fire/explosion	High
	1.2	1.2	Substances and articles that have a projection hazard but not a mass explosion hazard.	Fire/explosion	Medium
	1.3	1.3	Substances and articles that have a fire hazard and either a minor blast hazard or a minor projection hazard or both.	Fire/explosion	Low
	1.5	1.5	Very insensitive substances that have a mass explosion hazard.	Fire/explosion	Low
Flammable gases	2.1.1A High hazard	2.1	a) Ignitable when in a mixture of 13% or less by volume with air; or b) Has a flammable range with air of at least 12%, regardless of the lower flammability limit.	Fire/explosion	High
	2.1.2A Flammable aerosols	2.1	An aerosol comprising 45% or more by mass of flammable ingredients.	Fire/explosion	High
		LPG		Fire/explosion	Medium
Flammable liquids	3.1.A Very high hazard	3 PGI	A flash point of less than 23°C and an initial boiling point of less than or equal to 35°C.	Fire/explosion	High
	3.1B High hazard	3 PGII	A flash point of less than 23°C and an initial boiling point of greater than 35°C.	Fire/explosion	High
	3.1C Medium hazard	3 PGIII	A flash point of greater than or equal to 23°C but less than or equal to 60°C.	Fire/explosion	Medium
	3.1D Low hazard	Combustible liquids	A flash point of greater than 60°C but less than or equal to 93°C.	Fire/explosion	Low

Liquid desensitised explosives	3.2A 3.2B 3.2C	3 PGI 3 PGII 3 PG III	a) A substance that: (i) is listed as a liquid desensitised explosive and is assigned Packing Group I, II or III in the UN Model Regulations; or b) A liquid desensitised explosive that: (i) is formed from an explosive of Class I by adding a desensitising agent to form a liquid that no longer meets the threshold for Class I; and (ii) is not listed in the UN Model Regulations and is not assigned a Packing Group.	Fire/ explosion	High
Flammable solids – readily combustible solids and solids that may cause fire through friction	4.1.1A Medium hazard	4.1(a) PG II	A substance that burns rapidly or the reaction spreads rapidly or may cause fire through low friction in the relevant tests of the UN Manual of Tests and Criteria.	Fire/ explosion	Medium
	4.1.1B Low hazard	4.1(a) PG III	A substance that has lower ratings than 4.1.1A in the relevant tests of the UN Manual of Tests and Criteria.	Fire/ explosion	Low
Self-reactive substances	4.1.2A	4.1(b)	A thermally unstable substance that propagates a detonation or rapid deflagration or violent effect or thermal explosion in the relevant tests of the UN Manual of Tests and Criteria.	Fire/ explosion	High
	4.1.2B	Type A Type B			
	4.1.2C	4.1(b)	A substance with lower ratings than the above two categories in the relevant tests.	Fire/ explosion	Medium
	4.1.2D	Type C Type D			
	4.1.2E	4.1(b)			
4.1.2F	Type E	A substance with even lower ratings than the above two categories in the relevant tests.	Fire/ explosion	Low	
4.1.2G	Type F				
Solid desensitised explosives	4.1.3A 4.1.3B 4.1.3C	4.1(c) PG I PG II PG III	a) A substance with one of the specified UN serial numbers listed in the UN Model Regulations; or b) A solid desensitised explosive that is formed from an explosive of Class I by adding a desensitising agent to form a solid substance that no longer meets the threshold for Class I.	Fire/ explosion	High
Spontaneously combustible substances	4.2A Spontaneously combustible and pyrophoric substances High hazard	4.2 PG I	a) A solid substance that does not meet the criteria for subclass 4.1.2, but ignites within 5 minutes on contact with air under the relevant test conditions in the UN Manual of Tests and Criteria; or b) A substance that does not meet the criteria for subclass 4.1.2, but is a liquid which ignites or chars the filter paper under the relevant test conditions.	Fire/ explosion	High
	4.2B Spontaneously combustible and self-heating substances Medium hazard	4.2 PG II	A substance that does not meet the criteria for subclass 4.1.2 but meets specified criteria under the relevant test conditions.	Fire/ explosion	High

	4.2C Spontaneously combustible and self-heating substances Low hazard	4.2 PG III	A substance that does not meet the criteria for subclass 4.1.2, which, depending on quantity, meets specified criteria under the relevant test conditions.	Fire/ explosion	Medium
Solids that emit flammable gas when in contact with water	4.3A High hazard	4.3 PG I	a) A substance that emits a gas that ignites when a small quantity of the substance is brought into contact with water; or b) A substance that reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is > 10 litres/kg over any 1 minute.	Fire/ explosion	High
	4.3B Medium hazard	4.3 PG II	A substance that reacts readily with water at ambient temperatures such that the maximum rate of evolution is > 20 litres/ kg per hour.	Fire/ explosion	High
	4.3C Low hazard	4.3 PG III	A substance that reacts slowly with water at ambient temperatures so that the maximum rate of evolution of flammable gas is > 1 litre /kg per hour.	Fire/ explosion	Medium
Oxidising substances – liquids or solids	5.1.1A High hazard	5.1 PG I	a) A substance listed as 5.1 in the UN Model Regulations and assigned Packing Group I; or b) A solid that when mixed with dry cellulose either spontaneously ignites or exhibits a mean burning time less than that of a specified reference material; or c) A liquid that when mixed with dry cellulose forms a mixture that either spontaneously ignites or exhibits a mean pressure rise time less than that of a specified reference material.	Fire/ explosion	High
	5.1.1B Medium hazard	5.1 PG II	a) A substance listed as 5.1 in the UN Model Regulations and assigned Packing Group II; or b) A solid that does not meet the criteria of 5.1.1A and that when mixed with dry cellulose forms a mixture that exhibits a mean burning time equal to or less than a specified reference material; or c) A liquid that does not meet the criteria of 5.1.1A and that when mixed with dry cellulose forms a mixture that exhibits a mean pressure rise time less than or equal to that of a specified reference material.	Fire/ explosion	High
	5.1.1C Low hazard	5.1 PG III	a) A substance listed as 5.1 in the UN Model Regulations and assigned Packing Group III; or b) A solid that does not meet the criteria of 5.1.1A or B and that when mixed with dry cellulose forms a mixture that exhibits a mean burning time equal to or less than that of a specific reference material; or c) A liquid that does not meet the criteria of 5.1.1A or B and that when mixed with dry cellulose forms a mixture that exhibits a mean pressure rise time less than	Fire/ explosion	Medium

			or equal to that of a specified reference material.		
Gases	5.1.2A	2.2	a) A gas that is listed as 5.1 in the UN model Regulations; or b) A gas that causes or contributes to combustion of other material at a faster rate than air.	Fire/explosion	High
Organic peroxides	5.2A	5.2 Type A Type B	A substance that propagates a detonation or rapid deflagration or violent effect or thermal explosion in the relevant tests of the UN Manual of Tests and Criteria.	Fire/explosion	High
	5.2B				
	5.2C	5.2 Type C Type D	A substance with lower ratings than 5.2A or B in the relevant tests.	Fire/explosion	Medium
	5.2D				
5.2E	5.2 Type E Type F Type G	A substance with even lower ratings than 5.2A or B in the relevant tests.	Fire/explosion	Low	
5.2F					
5.2G					
Toxic substances	6.1A	6.1 PGI 2.3 (gases)	Oral toxicity: LD ₅₀ of less than or equal to 5 mg/kg Dermal toxicity: LD ₅₀ of less than or equal to 50 mg/kg Inhalation toxicity (gas): LC ₅₀ of less than or equal to 100 ppm Inhalation toxicity (vapour): LC ₅₀ of less than or equal to 0.5 mg/l Inhalation toxicity (dust/mist): LC ₅₀ of less than or equal to 0.05 mg/l	Human health	High
	6.1B				
	6.1C	6.1 PGII 2.3 (gases)	Oral toxicity: LD ₅₀ of greater than 5 mg/kg but less than or equal to 50 mg/kg Dermal toxicity: LD ₅₀ of greater than 50 mg/kg but less than or equal to 200 mg/kg Inhalation toxicity (gas): LC ₅₀ of greater than 100 ppm but less than or equal to 500 ppm Inhalation toxicity (vapour) LC ₅₀ of greater than 0.5 mg/l but less than or equal to 2.0 mg/l Inhalation toxicity (dust/mist) LC ₅₀ of greater than 0.05 mg/l but less than or equal to 0.5 mg/l	Human health	High
		6.1 PGIII	Oral toxicity: LD ₅₀ of greater than 50 mg/kg but less than or equal to 300 mg/kg Dermal toxicity: LD ₅₀ of greater than 200 mg/kg but less than or equal to 1000 mg/kg	Human health	Medium

	6.1D	Toxic Substances Regulations: Standard Poison	<p>Inhalation toxicity (gas): LC₅₀ of greater than 500 ppm but less than or equal to 2500 ppm</p> <p>Inhalation toxicity (vapour) LC₅₀ of greater than 2.0 mg/l but less than or equal to 10.0 mg/l</p> <p>Inhalation toxicity (dust/mist) LC₅₀ of greater than 0.5 mg/l but less than or equal to 1.0 mg/l</p> <p>Oral toxicity: LD₅₀ of greater than 300 mg/kg but less than or equal to 2000 mg/kg</p> <p>Dermal toxicity: LD₅₀ of greater than 1000 mg/kg but less than or equal to 2000 mg/kg</p> <p>Inhalation toxicity (gas): LC₅₀ of greater than 2500 ppm but less than or equal to 5000 ppm</p> <p>Inhalation toxicity (vapour) LC₅₀ of greater than 10 mg/l but less than or equal to 20 mg/l</p> <p>Inhalation toxicity (dust/mist) LC₅₀ of greater than 1.0 mg/l but less than or equal to 5.0 mg/l</p>	Human health	Low
Corrosive substances	8.2A	8 PG I	Data indicate irreversible destruction of dermal tissue following brief exposure	Human health	High
	8.2B	8 PG II	Data indicate irreversible destruction at dermal tissue following moderate exposure	Human health	Medium
	8.2C	8 PG III	Data indicate irreversible destruction at dermal tissue following lengthy exposure (up to four hours)	Human health	Low
Ecotoxic substances	9.1A Substances that are very ecotoxic in the aquatic environment	GHS	Acute aquatic toxicity value ¹ of less than or equal to 1 mg/l	Environment	High
	9.1B Substances that are ecotoxic in the aquatic environment	GHS	Chronic aquatic toxicity ² of less than or equal to 1 mg/l and a) acute aquatic toxicity value of greater than 1 mg/l but less than 10 mg/l; and b) not rapidly degradable or is bioaccumulative, or is not rapidly degradable and is bioaccumulative.	Environment	Medium
	9.1C Substances that are harmful in the aquatic environment	GHS	Chronic aquatic toxicity of less than or equal to 1 mg/l and: a) acute aquatic toxicity value of greater than 10 mg/l but less than 100 mg/l; and b) not rapidly degradable or is bioaccumulative or, is not rapidly degradable and is bioaccumulative.	Environment	Low
	9.1D Substances that are slightly harmful in the aquatic environment or are otherwise designed for biocidal action	GHS	a) Acute aquatic toxicity value of greater than 1 mg/l but less than 100 mg/l, but does not meet classification criteria for 9.1A, 9.1B or 9.1C; or b) Chronic aquatic toxicity value is less than or equal to 1 mg/l but does not meet classification criteria for 9.1B or 9.1C; or c) Not rapidly degradable and is	Environment	Low

			bioaccumulative but does not meet classification criteria for 9.1A, 9.1B or 9.1C.		
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- ¹ 'Acute aquatic toxicity value' means the lowest value expressed in units of milligrams of a substance per litre of water from:
- (a) fish LC₅₀ data after a 96-hour exposure period; or
 - (b) crustacean EC₅₀ data after a 48-hour exposure period; or
 - (c) algal, or other aquatic plant EC₅₀ data after a 72-hour exposure period.
- ² 'Chronic aquatic toxicity' means the lowest value expressed in units of milligrams of a substances per litre of water from chronic fish, crustacean, algal, or other aquatic plant NOEC (no observed effect concentration) data.

Appendix B: Spreadsheet for HFSP Calculations

Applicant number																		
Applicant																		
Contact name																		
Postal address																		
Site address																		
Phone number																		
Fax number																		
E-mail																		
Comment																		
Ref No.	Substances on this site	CAS no.	Effect type	Hazard rating	Base quantity	Form	Distance to boundary less than 30 m? Yes/No	Adjacent to water? Yes/No	Type of activity A/Ground B/Ground use	FF	FH	FE	Product of adjustment factors	Adjusted quantity A	Proposed quantity	Fire/explosion quantity ratio FQ	Human health quantity ratio HQ	Environment quantity ratio EQ
1			Fire/explosion Human health Environment															
2			Fire/explosion Human health Environment															
3			Fire/explosion Human health Environment															
4			Fire/explosion Human health Environment															
5			Fire/explosion Human health Environment															
6			Fire/explosion Human health Environment															
7			Fire/explosion Human health Environment															

8			Fire/explosion														
			Human health														
			Environment														
9			Fire/explosion														
			Human health														
			Environment														

Appendix 3.2-III Assessment of Environmental Effects

The Assessment of Environmental Effects should address the following matters:

- i) The proposed site operation and layout.
- ii) Quantities of hazardous substances used and stored, and proposed facilities.
- iii) Site drainage and off-site infra-structure.
- iv) Transfer/transport of hazardous substances on and off the site and selection of least risk routes.
- v) The sensitivity of the surrounding human, natural and physical environment and proposed measures to protect them.
- vi) Separation distances from neighbouring activities and people potentially at risk from the hazardous facility.
- vii) Identification of on-site hazards and exposure pathways from the proposed facility.
- viii) Potential cumulative effects with neighbouring facilities.
- ix) Fire safety and fire water management.
- x) Proposed contingency measures and emergency plans.
- xi) Proposed monitoring and maintenance schedules.