AGRICULTURAL and RURAL AVIATION GUIDANCE NOTE

1. Introduction

The agricultural and rural aviation industry provides services to primary production activities and associated rural activities through applying agrichemicals, fertilisers and Vertebrate Toxic Agents (VTAs)[1]from the air from both fixed wing aircraft (aeroplanes) and helicopters. The aerial application of these substances has the potential to cause adverse environmental effects if not adequately managed. These adverse effects primarily relate to the discharge of these substances but can also relate to land-based issues such as storage and the generation of noise.

The agricultural and rural aviation industry (the "industry") is subject to a number of legislative requirements but the focus of this guidance note is the key resource management issues under the Resource Management Act 1991 (RMA). Regional councils and territorial authorities both have roles and responsibilities for managing the effects of the industry. Regional councils are primarily responsible for managing the discharges associated with the industry whereas territorial authorities are primarily responsible for land-based amenity issues such as noise. Most industry operator's work in a number of different regions so have to comply with a range of plan provisions and controls which can increase the complexity of their operations if not well aligned and managed.

This guidance note provides a background to the agricultural aviation industry, outlines relevant industry best practice standards, and provides guidance on how industry operations can be managed through regional or district plans to address actual and potential adverse effects. This note outlines the nature and type of discharges associated with the industry and recommends a risk assessment/management approach to manage the actual and potential effects of these discharges based on appropriate performance standards. It also provides guidance on managing adverse effects and amenity issues associated with the land-based components of the industry's operations.

1.1 Purpose of the Guidance Note

This guidance note sets out the key resource management issues associated with the agricultural aviation industry and methods to manage the associated potential adverse effects. The purpose of this guidance note is to:

- raise the knowledge and understanding of the agricultural aviation industry and the nature of their operations among RMA practitioners;
- outline relevant industry best practice and Codes of Practice, including the AIRCARE™ Programme and how these can be used to help manage adverse effects and provide a basis for plan provisions and consent conditions; and
- assist in developing plan provisions that are consistent, achievable and not overly prescriptive to manage adverse effects and enable the industry to operate in a sustainable manner to deliver good environmental outcomes.

The guidance note is intended to help councils develop plan provisions and resource consent conditions that will manage potential adverse effects on the environment and deliver positive outcomes from both a council and aviation industry perspective. It promotes a risk based approach to manage discharges associated with the industry's operations coupled with the ability to demonstrate (verify), if required, how any environmental risks will be, or were, managed. It also promotes the use of established industry best practice and clear performance standards as a basis for provisions in regional and district plans rather than prescriptive requirements for how operations should be carried out. A Technical Overview of the Agricultural Aviation Industry is provided on the NZAAA website to support this risk management approach and use of industry best practice.

[1] VTAs are commonly referred to as bait.

1.2 Scope and structure of the guidance note

The guidance note is focussed on managing the environmental effects associated with the aerial application of fertiliser, agrichemicals and Vertebrate Toxic Agents (VTAs) which are the three main products associated with the industry. It outlines the nature of these discharges, relevant risk factors and exposure pathways that may lead to adverse effects, then sets out options to manage the effects of these discharges. Related land use matters that are generic to the application of all three groups of substances and aircraft are also addressed in this guidance note, including aircraft noise, storage and reverse sensitivity. Fertilisers, agrichemicals and VTAs may also be applied by ground based methods but these methods are not addressed in this guidance note as the potential effects of ground application and associated management tools are quite different to aerial applications. The guidance note is structured into the following sections:

- **The agricultural aviation industry** – An overview of the industry within New Zealand.
- **The environmental legislative context for the agricultural aviation industry**– focusing on roles and responsibilities under the RMA but also the interface of the RMA with other legislation such as the Hazardous Substances and New Organisms Act 1994 (HSNO).
- **The key resource management issues associated with the agricultural aviation industry**- including the actual and potential adverse effects associated with these issues.
- **A risk management approach to address resource management issues associated with the agricultural aviation industry** – a description of a risk management approach and how it could be applied to address the key resource management issues associated with the industry.
- **Managing discharges from the industry operations** – this section outlines the nature and potential effects of the aerial application of fertilisers, agrichemicals and VTAs). (In this guidance note, VTA application is confined to 1080 in cereal bait). It also outlines relevant risk factors and exposure pathways that may lead to adverse effects from the aerial application of these substances and provides guidance on managing these effects using a risk management approach.
- **Managing land use and amenity issues associated with the industry** – this section includes guidance on how to manage land-based issues associated with the industry's operations, including noise, storage and reverse sensitivity.

Appendix A – this appendix provides possible plan provisions and consent conditions to manage the effects of the aerial application of fertiliser, agrichemicals and VTAs based on the recommended approach in this guidance note.

There is a lot of technical information and terminology associated with the industry which has the potential to cause confusion. It can also create issues for the industry where inappropriate terminology is used in plan provisions to manage the aerial application of particular substances. In this document, preferred definitions have been provided for fertilisers, agrichemicals, and VTA. A glossary is provided to help explain and clarify the key terminology used in this guidance note and relevant legislation and a Technical Overview of the Agricultural Aviation Industry to support the Guidance Note is on the New Zealand Agricultural Aviation Association (NZAAA) website http://www.nzaaa.co.nz/ This information also includes a diagram setting out the relationship between the various terms.

1.3 Development of the Guidance Note

This guidance note was initiated in 2011 by NZAAA, which is the industry body representing pilots, operators and aerial organisations. NZAAA is a division within the Aviation Industry Association of New Zealand (AIA). Funding was obtained from the Sustainable Farming Fund and stakeholder organisations to develop the guidance note. The development process has involved regional meetings with councils, operators and stakeholders where key issues and management options were identified. Workshops were also held with pilots and operators at NZAAA conferences. Feedback on draft material was sought from the stakeholder group, which included industry, councils and related industries such as horticulture, agriculture and also environmental organisations. The guidance note has subsequently been considered and peer reviewed by planning practitioners, industry and the Ministry in 2013.

Acknowledgements

2. The agricultural aviation industry

2.1 Industry overview

Aerial agricultural operators apply three main types of substances; agrichemicals, fertilisers and Vertebrate Toxic Agents (VTA's) where ground based application is not possible or not the most efficient or effective means of application. Aerial application has also been used to apply substances for bio-security purposes, such as the eradication of painted apple moth in Auckland.

Aerial operations can be from either fixed wing aircraft (aeroplanes) or helicopters. The type of aircraft used will depend on the nature of the task to be undertaken and the target area. For instance, helicopters are better suited to follow complex boundaries, such as setbacks from streams or watercourses, whereas fixed wing aircraft are the logical choice for larger areas and higher payloads.

Currently there are approximately 110 fixed wing aircraft and 190 helicopters that undertake some agricultural aviation work in New Zealand. There are no restrictions on what part of the country an operator can work with many operators working in a number of regions throughout New Zealand. Each year about 60,000 hours of flying time (helicopters and fixed wing) can be attributed to agricultural work, with a trend towards more helicopter hours and less fixed wing. For more information on the industry, refer to the Technical Overview of the Agricultural Aviation Industryhttp://www.nzaaa.co.nz/technicalinformation to support this guidance note on the NZAAA website.

2.2 Industry regulations and best practice

There are a range of relevant industry regulations, codes of industry best practice and standards that operators comply with. In terms of flight safety, agricultural aviation is regulated by the Civil Aviation Authority (CAA) General Aviation Group. CAA operates a rules based system, and all operators and pilots are expected to comply with the standards set by these rules.

Environmental management is also a key component of industry regulations and best practice. Environmental management is addressed by the industry through the AIRCARE™ programme. AIRCARE™ is an integrated accreditation programme for all of an aviation business. It brings flight safety and environmental management together in one safety assurance programme.

There are three parts to the AIRCARE™ programme:

- ***Pilot competency*:** Certification is evidence of competency – in this context pilots must hold a current Agricultural Rating which demonstrates the pilot's competency to manage flight operations associated with applying all agricultural products. Under CAA Rule Part 61, a pilot must also have a Pilot Chemical Rating to apply agrichemicals and VTA's.

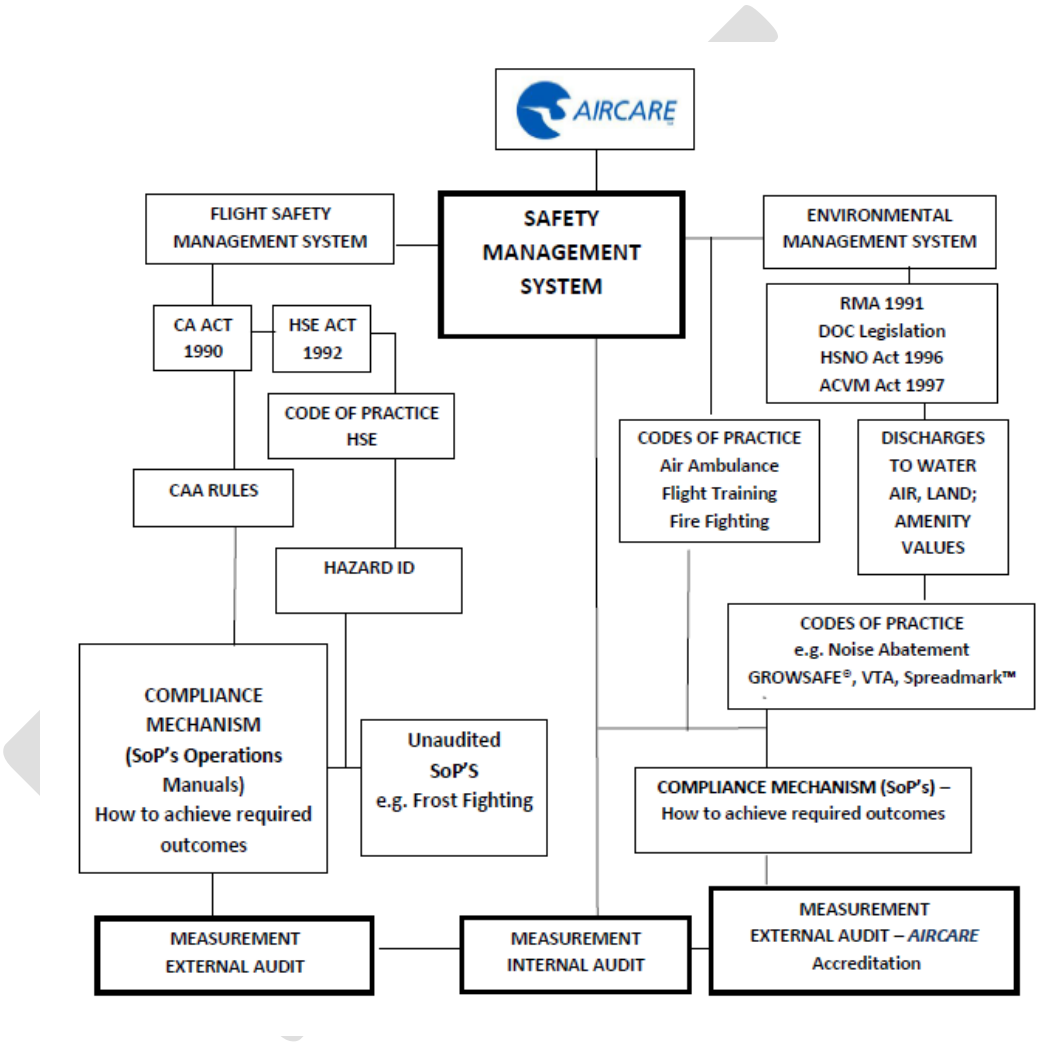
- ***Safety management system (SMS):*** The organisation (business) is required to run a safety management system. Accreditation is given to organisations able to demonstrate that the organisation has competent people – pilots and ground crew and that they are operating using a robust and active safety management system. It is the organisation that is accredited – not the pilots.

- ***Third Party audit:*:** An aerial organisation can attain AIRCARE™ accreditation only by satisfying an independent third party audit of the SMS and compliance with the relevant Codes of Practice for their operation.

Figure 1 represents the key compliance requirements for aerial operators. The left hand side sets out aviation flight safety and is mandatory under the Civil Aviation Authority Act 1990 for continued certification and licence to operate. The right hand side sets out the voluntary codes of practice covering environmental management. The four Codes of Practice (COP) that currently make up environmental management are:

- NZS8409:2004 Management of Agrichemicals (GROWSAFE®) www.growsafe.co.nz;
- SPREADMARK™ (Aerial) COP for the Placement of Fertilisers in NZ www.fqc.org.nz/aerial;
- AIRCARE™ COP for the Aerial Application of Vertebrate Toxic Agents www.nzaaa.co.nz; and
- AIRCARE™ COP for Noise Abatement www.nzaaa.co.nz.

Fig 1 AIRCARE™



The Safety Management System (SMS) is the management system operators utilise to manage their compliance with both the CAA Rules and the AIRCARE™ codes of practice. SMS is the way in which the entire organisation is run but in this context the focus is on those activities that have a direct bearing on environmental effects. The SMS audit has four main requirements:

- a quality assurance process;
- a procedure to identify hazards;
- a procedure to place controls on the hazards; and
- a procedure to measure the effectiveness of those controls (i.e. quality assurance and risk management).

3. Legislative context for environmental management of agricultural aviation operations

There are a number of pieces of legislation that manage the environmental effects associated with the agricultural aviation industry. The legislation of most relevance is the:

- Resource Management Act 1991 (RMA);
- Hazardous Substances and New Organisms Act 1996 (HSNO);
- Agricultural Compounds and Veterinary Medicines Act 1997 (AVCM); and
- Health and Safety in Employment Act 1992 (HSE).

The RMA is the main piece of legislation dealing with the environmental effects associated with the industry and is the focus of this guidance note. However, HSNO and ACVM and are also important as they play a role in managing the substances that the agricultural aviation industry discharges and can also apply conditions or controls relating to the use of agrichemicals, fertilisers and VTA's. There is the potential for duplication of requirements for operators across the RMA, HSNO and ACVM which can lead to increased complexity and compliance costs if these requirements are not well aligned. It is therefore important to understand these potential interface issues and how to align controls and conditions across these pieces of legislation to reduce unnecessary duplication, complexity and compliance costs.

The Health and Safety in Employment Act (HSE) is also relevant as it relates to the safety of people which is a relevant consideration under the RMA In the agricultural aviation context, the HSE Act is also included as part of the flight safety requirements. The HSE and potential interface with RMA and HSNO controls is discussed in the Technical Overview of the Agricultural Aviation Industry

3.1 Resource Management Act 1991 (RMA)

Both regional councils and territorial authorities have responsibilities for managing the effects of the agricultural aviation activities under the RMA.

Section 30 of the RMA sets out the functions of regional councils which include the control of discharges of contaminants into or onto land, to air or into water. It includes the control of the use of land for the purpose of maintaining and enhancing the quality of water which may, in the context of agricultural aviation, includes the control of the use of land for loading and mixing sites. Regional councils also have the function of controlling the use of land for the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances.

Regional council responsibilities are further addressed by section 15 of the RMA which sets out requirements for discharges of contaminants to the environment. In this context, discharges include agrichemicals, fertilisers and VTA's discharged to air, onto or into land where it may enter water, or directly to water. These substances fall within the definition of contaminants under the RMA. Resource consent is required for the discharge of contaminants unless it is specifically permitted by a rule in a regional plan. Regional plans often include permitted activity rules to enable discharges of these substances, subject to conditions and/or performance standards.

Section 31 of the RMA sets out the functions of territorial authorities, and they have primary responsibility for managing the effects of land use activities – which includes impacts on amenity values arising from these activities. In the context of the agricultural aviation industry, the most common amenity issue or concern relates to noise. However, it is important to keep in mind that under the RMA, territorial authorities only control aircraft noise while the aircraft is on the ground, not while in the air, so relevant matters are therefore airstrips and

landing areas. Some territorial authorities include rules in their district plans to manage the effects of land use associated with rural aviation, including noise associated with airstrips and landing areas.

Regional councils and territorial authorities both have responsibilities for preventing or mitigating the adverse effects of the storage, use, disposal or transportation of hazardous substances. The territorial authority has the primary responsibility unless the Regional Policy Statement specifies otherwise (refer s 62(1) i)). It is therefore important that controls relating to hazardous substances are aligned across regional and district functions and with the HSNO Act to avoid duplication.

3.2 Hazardous Substances and New Organisms Act 1996 (HSNO)

The purpose of the Hazardous Substances and New Organisms Act (HSNO) is to protect the environment, health and safety of people and communities by preventing or managing the adverse effects of hazardous substances and new organisms. The definition of hazardous substance is any substance with one or more of the following intrinsic properties - explosiveness, flammability, capacity to oxidise, corrosiveness, toxicity, and ecotoxicity. All hazardous substances are assessed under HSNO by the Environmental Protection Authority (EPA) to determine hazard classifications and controls.

A HSNO assessment has two key steps. Firstly, hazard classifications are given to a hazardous substance. The hazard classification is based on Hazardous Substances Minimum Degrees of Hazard Regulations 2001 and (Classification) Regulations 2001. Secondly, controls are placed on the substance depending on the hazard classification. Such controls may include requirements for identification, emergency management, disposal, tracking and the competency of users (approved handler).

Under the HSNO regulations, there is provision for group standards approvals for a group of hazardous substances of a similar nature, type or use. A group standard sets out conditions that enable a group of hazardous substances to be managed safely. Most domestic and workplace chemicals (except for pesticides, veterinary medicines, timber treatment chemicals and VTA's) are approved under group standards. There are specific group standards for fertilisers and for agricultural compounds, which set out nationally consistent conditions under which these hazardous substances can be managed safely. For more information on HSNO classes, controls and regulations see the Technical Overview of the Agricultural Aviation Industry on the NZAAA website and the Hazardous Substances section on the EPA website

Councils need to take account of the role of HSNO and the RMA when considering how hazardous substances should be dealt with in plans. Section 142 of the HSNO Act provides that RMA instruments can only include more stringent requirements than HSNO controls when they are considered 'necessary' for the purposes of the RMA. Regional and district controls should therefore only be used where the HSNO requirements are not sufficient to meet the purposes of the RMA. For more information see the guidance note on Managing Hazardous Substances - interface between the Hazardous Substances and New Organisms Act and the RMA.

3.3 The Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM)

The ACVM Act requires registration of products to ensure that they meet certain standards and do not pose unacceptable risks to trade in primary produce, animal welfare, agricultural security and public health. Registration of products under the ACVM Act is also intended to ensure that sufficient consumer information is provided on the label so the product can be used safely. Fertilisers, agrichemicals and VTAs are substances that need to be registered under the ACVM Act, unless exemptions apply. Section 5 of the ACVM Act specifies requirements whereby agricultural compounds are exempt from registration if conditions are met. Most fertiliser products are exempt from registration.

The ACVM Act is the means by which the information on a product label is determined and this establishes the framework within which a substance can be used. The HSNO Act also has labelling requirements as a result of hazard assessment of the substance. Therefore the label information provides the necessary information for a substance to be used safely and, provided this information is adhered to, the risks associated with the use of the substance should be adequately managed.

Currently many RMA plans require that manufacturer's recommendations are complied with as a means to avoid, remedy or mitigate adverse effects. The manufacturer's recommendations are based on the regulatory body requirements for the label. As the label requirements are determined by the regulatory body, not the manufacturer, it would be more accurate for plans to require that the label requirements are complied with, rather than the manufacturer's recommendations.

3.4 Interaction between legislative requirements

It is important to understand both the primary role of, and interaction between, the various pieces of legislation that regulate the agricultural aviation industry to ensure that controls are aligned and unnecessary duplication is avoided. Essentially the roles of the key pieces of legislation can be described as:

- the RMA identifies and manages ***risks*** to the environment associated with the discharge of the substances (contaminants) through plan provisions and consent conditions;
- ACVM and HSNO identify the ***hazards*** (and degree of hazard) associated with a substance and place conditions or controls to reduce *exposure* to these hazards to reduce *risk*; and
- the HSE manages the ***exposure*** of people to identified *hazards* to reduce *risk*.

The interaction between *risk, exposure* and *hazard* in the context of discharges from the industry is outlined further in the risk management section of this guidance note. Understanding the interaction and role of these legislative requirements enables controls to be aligned and utilised to avoid duplication and reduce risk.

RMA plans and resource consent conditions can utilise conditions and controls from HSNO, ACVM and HSE to assist in the management of risks to the environment. Where an appropriate framework exists under other legislation, it is not necessary for RMA policies and plans, or conditions of consent, to duplicate these requirements but rather these should be utilised to assist in implementation of RMA requirements. For example:

- HSNO controls and classifications can inform storage and management of substances, such as group standards for fertiliser;
- label requirements set by ACVM and HSNO form the basis of the risk a substance poses and how a substance should be used and managed;
- NZS8409:2004 Management of Agrichemicals is an approved Code of Practice under HSNO that is also relevant to management of agrichemicals under the RMA; and
- controls on use of VTAs through HSNO requirements can often cover the issues that a council would need to address in terms of VTA discharges.

4. Resource management and agricultural aviation

This section outlines the nature of the agricultural aviation industry operators, the potential environmental effects from these operations, and the challenges this presents for developing appropriate management approaches under the RMA. It also outlines the key resource management issues associated with the agricultural aviation industry and some important considerations when developing methods and provisions to address these issues in order to achieve desired outcomes for councils and the industry.

4.1 The nature of agricultural aviation activities

It is important to understand the outcomes sought from agricultural aviation operations and the numerous parameters affecting these operations in order to develop appropriate management methods and controls under the RMA. This is because the outcomes councils are seeking to achieve when managing the effects of industry discharges are often similar to the outcomes industry is seeking to achieve through discharging the selected product.

For an aerial agricultural application to be successful it is dependent on accuracy:

- the right product being discharged at the right rate;
- at the right place; and
- at the right time.

This outcome is therefore consistent with the outcomes that councils are seeking to achieve in terms of managing the potential adverse effects from the aerial application of the selected product not be applied accurately to the target crop and ensuring that products are applied in a safe manner. The challenge is to how to develop appropriate provisions and conditions that adequately provide for such outcomes. Importantly, no two situations will be the same for the aerial application of fertilisers, agrichemicals and VTAs and an operator must assess a range of variable factors to ensure that an accurate application is achieved. The key variables affecting aerial applications relate to weather conditions (eg: wind speed and direction, temperature), the target plants or animals, and the nature of the target area and surrounding location. To assist in achieving accuracy and to manage risks, aerial operators use a range of tools and methods such as GPS, calibration, nozzle selection, and pattern testing to certify equipment swath width and spreading evenness. Operators also seek to undertake their activities during suitable weather conditions when possible. The assessment of a specific situation will determine which tools an operator uses to address the risks that the situation presents. This is often exacerbated by:

- The visibility of an aircraft and the height and speed at which a discharge is made. This can lead to the perception that the degree of risk and potential adverse effect is significant and therefore the activity should be highly regulated.
- The confusion caused by the variable use of terms to describe or refer to the same substance which has implications for the perceptions, concerns and management approaches for that substance. For example is it a pesticide, an agricultural compound, an agrichemical or a hazardous substance. A chart in the Technical Overview of the Agricultural Aviation Industry demonstrates the linkage between the various terms.

The issues above and the fact that there are a range of variables affecting industry operation presents a challenge for councils in developing plan provisions and controls that both provide flexibility for different situations, while providing enough certainty to achieve the outcomes sought. A risk assessment/management approach by the party carrying out the operation – in this case the aerial operator – is an effective approach to manage these issues and provide flexibility in how desired outcomes are to be achieved which is important given the range of variables involved. This approach has proven to be effective because it deals with specific situations to allow decisions to be made to address the risks and potential adverse effects that situation presents and achieve the outcomes sought by the industry and councils.

4.2 Resource management issues and potential adverse effects from agricultural aviation activities

There are a number of key resource management issues and associated effects related to agricultural aviation activities that councils need to consider and manage. This includes:

- off-target drift and potential adverse effects;
- discharges into water bodies;
- advice and information before and after discharges;
- reverse sensitivity effects; and
- amenity issues such as noise.

The focus of the RMA is on managing the environmental effects of an activity, rather than the activity itself, which is consistent with an outcome based approach sought by the industry.. In terms of the discharge of agrichemicals, fertilisers or VTAs the potential adverse effects that need to be considered and managed include:

- health effects;
- contamination of crops and plants;
- contamination of domestic or commercial water supplies;
- contamination of indigenous flora and fauna, habitat areas and reserves;
- contamination of wetlands, surface water body and coastal and marine environments;
- contamination of groundwater;
- contamination of soils/ land; and
- amenity values where it creates an offensive and/or objectionable effect.

It is important to consider the scale and significance of the actual and potential adverse effects when developing plan provisions and imposing resource consent conditions. While agrichemicals, fertilisers and VTAs can all have adverse effects, the nature and degree of the potential adverse effects varies considerably due to the different nature of the substances and the sensitivity of the receiving environment the discharges are occurring within. For example, agrichemicals are designed to control pests whereas fertilisers are designed to assist plant growth. Both products have the potential to cause adverse effects through off-target drift but the consequences of such drift are significantly different. Agrichemicals are likely to damage a non-target crop but fertilisers are unlikely to cause such damage although off target drift of fertiliser onto an organic property could affect the organic registration of the property. The substance specific sections on fertilisers, agrichemicals and VTA in this guidance note outline the nature of these substances and their potential adverse effects in more detail.

4.2.1 Potential for adverse effects from off-target drift

The two pathways that adverse effects may occur as a result of aerial application are direct application and indirect application more commonly known as “off-target drift”. Off-target drift is where the substance being applied ends up in a place other than the target area. It can occur in both fertiliser and agrichemical applications but the potential for off-target drift is less for VTA’s because of the physical properties of the substance (i.e. large particle size and predictable trajectory from the point of release).

An operator seeks to apply the product at the correct rate to the target crop or area, so adverse effects from direct application should generally not arise. However, due to the range of variables affecting these operations off-target drift will inevitably occur in some situations and this is the most likely cause of adverse effects. Off-target drift is a key resource management issue for the industry because of the potential adverse effects that may arise, particularly in sensitive areas where people, water bodies and non-target property are exposed to the discharge. Off-target drift is also a major source of complaints associated with aerial applications.

There needs to be a focus on ways to minimise the risk of off--target drift and the potential for adverse effects from this drift on surrounding areas and it is appropriate for councils to identify this as an issue and include supporting methods in plans to manage the potential adverse effects. However, determining how off-target drift occurs and how best to manage and avoid it is not a simple matter as there are a range of variables which all contribute to its occurrence, to a greater or lesser extent, depending on the circumstances. The five groups of important variables that contribute to off-target drift are:

a) material (e.g. formulation or product type);
b) physical characteristics (i.e. product quality - droplet size or particle size);
c) release position (i.e. height above the ground /target);
d) interception (by the target); and
e) meteorology (wind speed and direction)

These variables are either:

- **"pre-determined factors**"– factors that do not change once the application has begun (e.g. spray nozzle type and hence droplet size); or
- **"real-time factors**– factors that can change while the application is occurring (e.g. wind speed and direction).

The distinction between pre-determined and real time factors is important because the most significant factor causing adverse effects from off-target drift is almost always wind direction – a real time factor. Further information on off-target drift is included in the Technical Overview of the Agricultural Aviation Industry on the NZAAA website and the substance specific sections for agrichemicals, fertilisers and VTA's in this guidance note.

4.2.2 Potential for adverse effects from discharges into water bodies

Discharges of agrichemicals, fertilisers and VTAs close to water bodies can be a resource management issue where these may enter into water or onto land that enters into water. Where this occurs, these discharges have the potential to cause adverse effects on the quality of the waterbody and its ecosystems, and on uses of the waterbody (e.g. drinking water supplies, irrigation). These discharges can occur through either direct application or indirectly through off-target drift.

Clear identification of waterbodies and the proximity of aerial applications to these water bodies is a critical part of identifying the potential risk of direct application and off-target drift and ensuring that appropriate measures are taken to avoid discharges to water or onto land that may enter water. Some plans include specified setback distances as a means to reduce the risk of discharges entering water bodies. However, there often needs to be flexibility to ensure the setback distance can be varied and targeted to the circumstances of the individual situation based on the actual level of risk of discharges entering into the water body. Other activities associated with aerial applications, such as loading and mixing sites, also need to be located and managed to avoid potential adverse effects on water bodies.

4.2.3 The need for information and advice about discharges (e.g. notification)

People who may be adversely affected by an aerial application of agrichemicals, fertilisers and VTA's often want to be notified before a discharge is to occur and provided information on the nature of the discharge. Notification, or lack of it, is often a source of complaints about discharges from aerial applications. Providing this notification and information often influences the perception and concerns of people about the aerial application so the provision of timely and appropriate advice can help address this issue and the potential for

complaints/concerns. However, providing information and advice also raises a range of issues relating to the different methods used, and the various obligations and responsibilities of councils, landowners and aerial operators.

For agricultural aviation operators providing early notification of their operations can be problematic because they fly onto a property to complete a task but do not meet directly with the neighbours or surrounding land owners. However, in the event of a complaint it is usually the aviation company that is identified. It is therefore important to obtain clarity and certainty about the obligations and responsibilities for notification of aerial applications. This should clearly identify who is responsible for undertaking the notification, who will be notified, what form notification should be in and the timeframes for this notice.

4.2.4 Potential for reverse sensitivity effects

Reverse sensitivity may arise where more sensitive activities are allowed to locate next to established activities and have concerns about the adverse of those activities leading to potential complaints and constraints on those activities. Reverse sensitivity is a key resource management issue for a number of rural activities, including the agricultural aviation industry.

In respect of agricultural aviation, reverse sensitivity usually involves complaints about an aerial application of agrichemicals, fertilisers and VTA's even though there may be no adverse effects associated with that application. Reverse sensitivity is a particular issue in rural-residential areas or where there are 'life-stylers' living in agricultural areas who may not appreciate the importance of applying substances by air or the measures that are taken to avoid or mitigate adverse effects. Reverse sensitivity can also occur between primary production activities, where one activity is sensitive to the substances being applied (e.g. vineyards amongst pastoral land uses or organic properties). To help avoid reverse sensitivity, councils need to consider the compatibility of activities in different areas and their potential sensitivity to one another in order to reduce the potential for reverse sensitivity complaints. For more information see the reverse sensitivity section of this guidance note.

4.2.5 Noise

The main potential adverse effect on amenity is associated with aircraft noise from aerial applications which sometimes leads to concerns and complaints relates. However, the RMA does not control noise of aircraft in the air, and the responsibility of territorial authorities is limited to the management of noise while the aircraft is on ground. It is important to acknowledge this and communicate this to those who may raise concerns about the noise of aerial applications to help reduce the potential for complaints and concerns from surrounding land-uses. For more information see the aircraft noise section of this guidance note.

4.3 Considerations in developing methods and plan provisions to address identified issues

Developing effective and appropriate plans provisions to manage agricultural aviation activities is complex as there are multiple variables that need to be considered for any aerial application. It is also important to avoid overly complex and prescriptive plan provisions and consent conditions so there is an inherent tension about how to develop simple plan provisions and controls to manage a complex and variable activity. To ensure appropriate methods and plans provisions are developed there are a number of important factors to consider. Key considerations include:

- ensuring provisions recognise the multiple variables involved in aerial applications to ensure there is enough flexibility to accommodate different circumstances;

- using a risk assessment/management approach expressed through controls and appropriate performance standards aimed at achieving clear outcomes sought;
- avoiding duplication in requirements from other legislation and, where possible, aligning controls and classifications
- providing alignment and consistency across regions and with adjoining councils where appropriate to avoid complexity for operators who work in a number of regions
- ensuring there is recognition of the positive effects of agricultural aviation, such as pest control, increased or improved primary production and public health, when managing potential adverse effects from the industry
- ensuring management controls and conditions are achievable and verifiable and don't impose undue constraints or compliance costs.
- utilising established industry best practices and standards as an appropriate mechanism to incorporate into plan provisions and consent conditions (e.g. permitted activity conditions in rules that utilise established industry best practice codes and standards); and.
- developing provisions that provide the flexibility to adapt over time and use best practice according to the circumstances of the situation.

The substance specific sections provide more guidance on developing plan provisions to manage the adverse effects of discharging agrichemicals, fertilisers and VTAs from air and the land section provides more specific guidance on managing amenity and reverse sensitivity issues associated with the industry's land based activities.

5. A risk management approach to writing plan provisions for agricultural aviation

5.1 Rationale for a risk management approach

Agricultural aircraft operate in an environment where many of the relevant parameters are variable over time and from place to place (e.g. wind speed, wind direction, temperature, location of the application target, the coverage required, and the surrounding activities and areas). Therefore it can be challenging to manage the effects of these operations through plan provisions and controls that will be appropriate for all situations.

Traditionally the approach has been to prescribe limits or specifications, such as how the operation should be carried out. Such a prescriptive approach assumes that compliance with requirements will achieve the desired outcomes and can often result in a complex suite of requirements to catch all possibilities, which may not actually adequately address the actual situation or achieve the desired outcomes.

This guidance note promotes a risk assessment/management approach to address the ***actual risk*** of the situation and the use of appropriate performance standards to achieve desired outcomes. This approach is intended to provide more flexibility in how outcomes are to be achieved while providing clear performance standards for operators to meet (e.g. "no fertiliser directly into water").

Adopting this risk management approach requires the person responsible for the discharge to assess the situation and circumstances and adopt appropriate procedures to ensure that risks are appropriately managed and the performance standards are achieved. For agricultural aviation activities, a risk management approach requires a pilot to:

- undertake an assessment of the risk of the application which takes into account the nature of the substance being discharged and the actual (real time) situation;
- choose appropriate actions to address and minimise the identified risks; and

- follow best practice when undertaking their operations and be able to verify that.

Under this approach a pilot must also accept the responsibility for the outcome and take all practicable steps to minimise the risk. If requested, a pilot should also be able to demonstrate how the activity was carried out and that the performance standard was achieved. For example:

- what discharges occurred?
- where did the discharge go?
- what were the (weather/real time) conditions at the place and time of application?

The methods adopted and requirements for verification should reflect the level of risk of the application. The Technical Overview of the Agricultural Aviation Industry on the NZAAA website contains relevant technical information for pilots to manage risk, and to satisfy the task verification requirements by any authorised third party. These methods enable operators to demonstrate that aerial application tasks were carried out according to industry best practice.

5.2 The risk management approach

Risk assessment management is a well-established approach to manage a range of activities. This approach is based on the relationship between hazard, exposure and risk where:

Hazard x Exposure = Risk (level)

Hazard	=	Something that could present a risk – a potential adverse effect.
Exposure	=	The extent to which you are exposed to the hazard.
Risk	=	The combination of the nature of the hazard and level of exposure determines the degree/magnitude of risk.

The state and nature of the substance influences the degree of hazard from aerial application of fertilisers, agrichemicals and VTAs, the degree of exposure and hence risk. The following table compares the risk of off-target drift based on the state of the substance and its ballistic properties (that is the extent to which the trajectory of released particles can be predicted).

Table 5.2.1 Comparative risk of off-target drift as a function of the state of the substance (ie, S, solid, L liquid, V vapour) and particle size (ballistic properties)

Potential off-Target drift / ballistic properties	State		
	Solid	Liquid	Vapour
< 200 µm	high	high	High
0.5 mm	moderate	moderate	High
> 1000 mm	low	Low*	high

* = with larger droplet sizes the potential for droplet shatter into smaller droplets increases thereby increasing the risk. The same applies to large solid particles that break up when discharged.

Understanding the comparative risk of off-target risk is important as the state of the substance varies between fertilisers, agrichemicals and VTAs:

- **Fertiliser -** As well as typically being relatively low hazard most fertilisers are in a solid form and particles larger than 0.5mm (i.e. a low hazard substance can more effectively be contained to the target area).
- **Agrichemicals** - Most agrichemicals are in liquid form and although the means to contain them to the target is available, the larger droplet sizes may mean a reduction in efficacy of the agrichemical which is a dis-incentive. Increased spray drift potential is intimately associated with small droplets (< 200 µm).
- **VTAs** - 1080 Bait (VTA) is normally applied in a compressed cereal "cylinder" each of which weighs about 12 gm, i.e. it is entirely a matter of where it is directed that determines where it goes. By contrast, where a vapour is directed or produced will have little influence on where it goes – local wind and variation in temperature will be the main determining factors.

Once the level of risk from the hazard is identified, steps can then be taken to eliminate the hazard, isolate the hazard, or reduce exposure to it. This approach involves asking relevant questions so that the best option to manage the risk can be identified, as set out in the following table:

Table 5.2.2 Managing the risk

Is there a risk?	Contributing factors	Reference in GN
Is the risk significant?	Combination of likelihood and potential adverse effect	Table 5.2.3
What could be the adverse effect from the hazard?	Potential adverse effects	4.2
What are the possible reasons for the adverse effect?	Risk factor	Table 5.2.5
How could it occur?	Exposure pathway	pathways
How can the potential effect be managed?	Management options	Table 5.2.5 Fert – Table 6.1 Agchem – Table 7.1 VTA's – Table 8.1

To assess the significance of the risk both the likelihood of the adverse event occurring and the potential impact need to be determined. Refer to the Technical Overview of the Agricultural Aviation Industry (Section E – Risk Management).

A risk matrix as set out below can also be used to assess the level of risk based likelihood of an adverse effect together with the potential impact of that adverse effect. The colours indicate the degree of risk and management options can then be selected that reflect the degree of risk, which may include not undertaking aerial applications at that point in time.

Table 5.2.3: Is the risk significant?

Potential impact (of an adverse effect)	Likelihood (of an adverse effect occurring)		
	High	Medium	Low
High			
Medium			
Low			

5.3 Applying a risk management approach to agricultural aviation discharges

The following sections provide guidance on managing the effects of discharges from the industry, focusing on the three main types of substances that are applied from the air – fertilisers, agrichemicals and VTAs. Understanding the nature of these discharges and associated potential adverse effects is important to ensure the management approach is focused on the actual risk factors associated with the substance being applied.

Managing the risk

Managing the risk should involve the following steps:

- Assessing the potential adverse effects;
- Considering the relevant risk factors;
- Identifying the exposure pathways; and
- Developing and applying appropriate management options

5.4 Risk Factors

The reasons for and magnitude of potential adverse effects from agricultural aviation operations is related to a range of risk factors. The extent to which a risk factor applies varies according to the nature of the receiving environment and on the type and nature of the discharge. Key risk factors to consider include:

- the chemical being used
- exposure pathway
- the concentration and rate of application of the substance;
- the timing of the application and its proximity to people and sensitive areas;
- the location of the application and use, including mixing sites;
- on site/real time weather conditions and their suitability for the task/application;
- substance characteristics (e.g. particle size or ballistic properties);
- accuracy of the target identification;
- the permeability of the soil; and
- proximity of the target to water bodies.

A risk based approach enables management controls to be clearly linked to these risk factors in order to manage potential adverse effects. This is illustrated in the table below which identifies the comparative risk of fertilisers, agrichemicals and VTAs based on a range off-target deposition sites.

Table 5.2.4 Comparative risk as a function of substance hazard

Off-target deposition site	Substance/product potential adverse effect		
	Fertiliser	Agrichemical	VTA (bait)
Crops	Low	High	Low/nil
Human health	Low	high	high
Flora/fauna (environment)	Low	High	Very high
Water (transport mechanism)	Moderate	High	High
Soil (accumulation)	Moderate	high	nil
Summary of comparative risk	Low	High	high

Substance hazard

The comparative risk associated with off-target deposition of an agrichemical or VTA is higher than for a fertiliser. In this guidance note, VTA application is confined to 1080 in cereal bait which is no more hazardous by comparison to HSNO classifications of some products in the range of agrichemicals applied by air. The substance hazard and the degree of exposure to it together constitute the risk.

Risk assessment factors

Once the relevant risk factors have been identified, these can then be assessed to determine the appropriate information requirements and pilot management options. Distinguishing between pre-determined and real time risk assessment factors is important because the most significant factor causing adverse effects from off-target spray drift is almost always wind direction – a real time factor. The real time factors are those which can vary over the time of the operation, such as the weather conditions. A pre-determined factor is one that is evident and on which decisions are made before the application commences. These real time and pre-determined risk factors are identified in Table 5.2.5 along with corresponding information requirements and pilot management options. This table is based on a risk management approach with requirements and management options based on the level of risk from each factor.

Table 5.2.5 Risk assessment requirements and management controls for aerial application of fertiliser, agrichemical and VTA

	Risk assessment requirements	Information needed	Information able to be used for task verification	Pilot Management
1	(a) Application site (target)	(b) Location and boundaries	• GIS co-ordinates, dated photograph • Hand-written diagram or map, verbal	(c) Application plan with map detailing location and boundaries
2	(d) Sensitive area	(e) Nature of and location with respect to application area	• GIS co-ordinates, dated photograph • Hand-written diagram or map • Verbal only if task is low risk	(f) Sensitive areas identified and actions taken to avoid adverse effects
3*	(g) Wind direction	(h) Direction (bearing) at the application site at the time	• Digital recording wind vane/sensor with time base • Hand held vane or equivalent • Smoke or other visual indicators	(i) Adjacent to sensitive areas - application only when wind is away from sensitive areas and wind speed is steady
4*	(j) Wind speed	(k) Speed at the application site at the time	• Digital recording wind vane/sensor with time base • Hand held anemometer or equivalent • Smoke or other visual indicators	(l) Adjacent to sensitive areas, no application when wind speed exceeds the limits according to the risk.

	Risk assessment requirements	Information needed	Information able to be used for task verification	Pilot Management
5	(m) Particle size	(n) Physical properties of the product being applied	• Documented record of particle size and size range, and stability, ie volatility (liquid) or fragmentation (solid)	(o) Adjacent to sensitive areas, physical properties of the product must be such that trajectory after release is predictable
6	(p) Product hazard	(q) HSNO Hazard classifications and controls	• Product selected taking account of HSNO class and the at-risk sensitive locations, all documented	(r) Extra care taken if using Class 6.1 A, 6.1B, 6.1C, 9.1A, 9.2A, 9.3A , 9.4A adjacent to sensitive areas.
7	(s) Effective height of release of product	(t) Application method Including lateral spreading vs localised	• Application equipment selected to minimise product losses between the point of release and the target all fully documented	(u) Product directed to the target at all times
8	(v) Product hazard	(w) HSNO classification, Bio-accumulation, water solubility and attributes relevant to potential adverse effects	• Product selected according to application task, taking account of HSNO class, efficacy and other attributes and the	(x) Choose least hazardous product suitable for the task

	Risk assessment requirements	Information needed	Information able to be used for task verification	Pilot Management
			at-risk sensitive locations, all according to written prescriptions documented	
9*	(y) Buffer zone	(z) Downwind application free zone	• Location of application target and sensitive area known and logged, communication/notification confirmed, product quality, and wind direction known and drift modelling done	(aa) Adjacent to sensitive areas, application only when wind is away from sensitive areas and is a steady wind speed
10	(bb) Shelter belts	(cc) Nature of and location with respect to application area	• Location of application target and sensitive area known and logged, communication/notification confirmed, product quality, and wind direction known and drift modelling done	(dd) As above but also operation planned to take account of hazards associated with shelter trees and structures.
11*	(ee) Humidity	(ff) Air temperature	• Humidity measured and recorded on site at the time	(gg) Specific controls according to the volatility of the product being applied

	Risk assessment requirements	Information needed	Information able to be used for task verification	Pilot Management
12*	(hh) Atmospheric stability	(ii) Inversion layer	• Wind and temperature data recorded on site such that no inversion layer, and visual clues e.g. smoke to test for inversion according to the risk	(jj) If label information indicates volatility an on-site test for inversion layer should be made.

NOTE * = a real time factor = factors that can change while the application is occurring (e.g. wind speed and direction).

5.5 Exposure pathways

The *indirect* exposure pathways for adverse effects are:

- **Off-target drift or dust–**Off-target drift is where the product drifts beyond the target area and this - may, or may not, lead to adverse effects, depending on the nature of the non-target area. For example, lime dust on a neighbouring farming property may not be regarded as an adverse effect by the owner whereas lime dust on a roof where water is being collected is likely to be regarded as an adverse effect.
- **Overland flow -** This is where there is runoff from land when product has been applied and this flows overland with product entrained in the flow ending up in a waterbody. Operators can minimise the risk of this occurring by ensuring that product has time to be absorbed before heavy rainfall events.
- **Leaching through soil -**Leaching is the movement of a substance through the soil into groundwater. Leaching may only remove mobile components of the product while some immobile components remain bound to soil particles and accumulate to unacceptable levels. The potential for leaching depends in part on the chemical and physical properties of a product and the permeability of the soil. To reduce the potential for leaching, regional plans may have controls on the amount of product that can be applied (input control) or have limits on the amount of leaching that can occur (output control). The rate and type of product being applied needs to take into account any such requirements.

The *direct* exposure pathways for adverse effects are:

- **Applications direct to non-target area** - This is where there is a direct application on a non-target area, such as a non-target crop, water body or sensitive area which may result in adverse effects. Such a situation should only arise where care has not been taken to ensure that the application is only accurately directed and applied to the target area. Management controls can be imposed that require applications to avoid non-target areas, water bodies or sensitive areas.
- **Frequency and rate of application** - The frequency and rate of application can determine the potential for adverse effects, particularly soil contamination or leaching to water. The task of the aerial applicator is to apply the required amount of product to the target area as instructed by the land manager/owner (client). It is the role of the land manager/owner to ensure that relevant RMA requirements are met. All farmers or growers applying products should prepare a management plan to ensure that the amount of product being applied is appropriate.
- **Exposure of public in public areas at time of application** - Applications can occur in public areas and there is a risk of direct exposure to the product being applied. Care needs to be taken to ensure that public areas are free of people at the time of application.

Indirect and direct exposure pathways include:

- **Inappropriate disposal of wastes** - Inappropriate disposal of surplus or waste could lead to product ending up in water bodies or sensitive areas. Care should be taken to ensure that disposal does not lead to such effects.
- **Spillages/ overflows at loading sites -** For aerial applications the loading site is the area between the storage area and where the aircraft stops for loading. The Safety Guidelines and the appropriate loading practices can be found in the Health and Safety section of the CAA web site

When loading substances care should be taken to ensure that the product is loaded into the aircraft to avoid excess product in one area otherwise this can lead to contamination of the specific area or leaching into water. If the loading area is near a water body or bore then extra care is required to ensure that no product ends up in the water body or bore

Management Options

Tables have been drafted using headings to identify management options for the aerial application of fertilisers, agrichemicals and VTAs and for the management of aircraft noise. When identifying the appropriate management option, it is also important to assess the key considerations when developing plan provisions and controls to manage the adverse effects of the agricultural aviation industry.

6. Fertilisers

Fertilisers are substances that are applied to land to improve the productivity of plants for primary production, which includes pastoral farming (sheep, beef, deer and dairy), horticulture, viticulture, and forestry. They are critical to the success of primary production and therefore contribute to GDP and the economic well-being of communities. Fertilisers are also used on sports fields and golf courses. About 600,000 tonnes of fertiliser is applied by air annually in New Zealand, both by fixed wing aircraft and helicopters.

There is a wide range of fertilisers used for different purposes, in both solid and liquid forms. The most common types are superphosphate (P) and nitrogen based fertilisers (N). Essential nutrients to retain soil balance, such as potassium and sulphur, magnesium and cobalt, are also applied as fertilisers or added to fertiliser mixes. Agricultural lime is also applied to condition and change the pH of the soil.

6.1 Fertiliser definition

The ACVM Regulations define fertiliser as:

(a) means a substance or biological compound or mix of substances or biological compounds that is described as, or held out to be for, or suitable for, sustaining or increasing the growth, productivity, or quality of plants or, indirectly, animals through the application to plants or soil of—

(i) nitrogen, phosphorus, potassium, sulphur, magnesium, calcium, chlorine, and sodium as major nutrients; or

(ii) manganese, iron, zinc, copper, boron, cobalt, molybdenum, iodine, and selenium as minor nutrients; or

(iii) fertiliser additives; and

(b) includes non-nutrient attributes of the materials used in fertiliser; but

(c) does not include substances that are plant growth regulators that modify the physiological functions of plants.

This definition is considered an appropriate definition for incorporation into plan provisions. For other definitions of fertiliser see the Technical Overview of the Agricultural Aviation Industry.

While not specifically mentioned or provided for in the RMA, fertilisers are managed under the RMA as they fall within the definition of contaminants, and regional councils are responsible for managing their discharge to air, onto or into land and/or water. The application of fertiliser, including aerial applications, is generally provided for in regional plans as a permitted activity, subject to conditions. Territorial authorities are primarily responsible for the management of land use activities including the control of hazardous substances. As most fertilisers are

classified as hazardous substances, district plans should address the storage of these substances. The HSNO regulations are relevant in this regard and are discussed further in the Technical Overview of the Agricultural Aviation Industry.

6.2 Aerial Application of fertiliser

Superphosphate (P) is typically applied from the air at rates of between 100 and 300kg/ha over complex topography where no other application methods are viable. Superphosphate fertilisers tend to be of variable quality in terms of particle size and size range. Nitrogen based fertilisers (and other high analysis fertilisers) tend to be applied over more productive, and hence more uniform land for both pasture and cropping. Nitrogen based fertilisers are also usually are more uniform and consistent in terms of particle size.

Maximising the productivity gains from fertiliser application requires evenness of application across the target area. Achieving an even application within the target area has an impact on the precision of application (i.e. the requirement to confine the fertiliser to the target area). There are a range of systems, equipment and techniques required to consistently and reliably achieve an even application of fertiliser and this also enables fertiliser applications to be confined to the target area.

There are a number of publications setting out best practice for fertiliser application including:

- Safety Guideline: Farm Airstrips and associated fertiliser cartage, storage and application http://www.caa.govt.nz/HSE-CAA/HSE_Info.htm#Ag
- Code of Practice for Nutrient Management (COPNM) http://www.fertiliser.org.nz/Site/code_of_practice/default.aspx
- Fertmark Code of Practice http://www.fertqual.co.nz/files/downloads/fertmarkcodeofpractice.pdf
- The Aerial Spreadmark Code of Practice (Part A and Part B)

For more information on these codes and standards see the Technical Overview of the Agricultural Aviation Industry

6.3 Risk factors of aerial application of fertilisers

The key risk factors for aerial application of fertiliser are particle size, wind speed and wind direction. It is important to recognise that not all fertiliser has the same physical characteristics. The particle size of fertilisers varies, which directly affects the ballistic property of the substance and how it falls when discharged. Coarser particle size means that the product trajectory will be more predictable, whereas a smaller particle size presents a greater likelihood of off-target drift and dust.

Wind speed at the time of application influences how far the fertiliser will travel from the point of release. At a given wind speed, small particles will move downwind further than large particles. Wind direction determines the direction in which the fertiliser particles will travel. Both wind speed and wind direction needs to be factored in by the pilot, along with the product quality and particle size to determine flight paths, to avoid sensitive areas, and ensure the product is applied to the target area. An operator can verify the track flown and where they have discharged fertiliser but to accurately verify where the product has landed requires information on wind speed (which influences how far the product will go from the track flown) and wind direction which determines the direction the fertiliser particles will travel from the point of release.

6.4 Management options for the aerial application of fertilisers

The risk management section sets out the general framework for a risk management approach for aerial applications. This section provides guidance on how to apply this approach specifically to manage the discharge of fertilisers. Table 6.1 below identifies management options for plan provisions and consent conditions to manage the adverse effects from the aerial application of fertilisers based on the type of adverse effect, relevant risk factors and the exposure pathway. It also identifies the measures pilots can take to minimise risks and potential adverse effects from the aerial application of fertilisers.

Table 6.1 Risk management approach for aerial application of fertiliser

Potential adverse effects	**Risk factor**	**Exposure pathway**	**Pilot Management options**	**Options for plan provisions and consent conditions** *Refer to Appendix A*

• Health effects which may include:
  • Allergic reactions
  • Irritations
  • Toxic poisoning
	• Hazard class of chemical (substance) being used and exposure to it(Class 6 and 9)	Indirect:
		• Off target drift or dust
		
		Direct:
		• Applications to non-target area through handling and loading
			Indirect:
			• Minimising potential for drift – technical options (Refer Technical Overview of the Agricultural Aviation Industry*)
			Direct:
			• PPE management of loading and handling operations
				• Require operator risk assessment to ensure use of appropriate technical options
				
				• Classify dwellings, educational facilities and public places as sensitive areas (drift hazard of fines)

• Contamination of crops and plants including sensitive crops and organically farmed properties.
 	
• Effects include:
  • Growth and quality of the crop; or
  • Threatens organic registration
	Fertiliser type:
	• Excessive residue levels
	• Timing of application
	• Crop stage
	• Application rate – calibration
	• Drift
		Indirect:
		• Off target drift
			Indirect:
			• Minimising potential for drift – technical options (Refer Technical Overview of the Agricultural Aviation Industry*)
				• Require operator risk assessment to ensure use of appropriate technical options
				• Classify crops and non-target plants as sensitive areas

• Contamination of domestic or commercial water supplies where it renders the drinking water non-potable.	Fertiliser hazard and type: • Hazard classes	Indirect: • Off target drift Direct: • Applications to non-	Indirect: • Minimising potential for drift – technical options (Refer Technical Overview of the	• Require operator risk assessment to ensure use of appropriate technical options • Classify water bodies/ drinking water supplies as

Potential adverse effects	Risk factor	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
		target area	Agricultural Aviation Industry*)	sensitive areas • It may be appropriate to include conditions for some applications over or near such areas
• Contamination of indigenous flora, fauna, habitat areas and reserves where the inherent values of these areas are damaged or lost.	Ecotoxicity of fertiliser: • 9.3A and 9.4A • Poor/no target identification • Fertiliser quality (particle size and stability)	Indirect: • Off target drift Direct: • Applications to non-target area	Indirect: • Minimising potential for drift – technical options (Refer Technical Overview of the Agricultural Aviation Industry*) • Target site ID (GPS) • Ensure that fertiliser quality is appropriate to minimise potential for drift	• Require site identification as part of risk assessment • Classify as sensitive areas • Controls by hazard classification (e.g. 9.3 and 9.4)
Contamination of wetlands, surface water bodies, and coastal and marine environments where it causes: • Death of fish or flora and fauna • Water takes affected leading to un-potable water or damage to crops and animals	Fertiliser type and hazard class 9.1A, 9.3A or 9.4A 6.1A, 6.1B, and 6.1C: • Application rates • Location of application and proximity to water take points • Inappropriate disposal • Poor/no target identification • No ID of at-risk water bodies	Indirect: • Applications adjacent to water bodies – off target drift or overland flow • Disposal adjacent to water Direct: • Applications into water • Spillages/ overflows at	• Management measures for loading sites • Follow label requirements • All reasonable measures must be taken to avoid discharges to surface water bodies – risk assessment to establish appropriate measures • Use of fertiliser with	• Require that loading sites in proximity to waterbodies be managed to contain spillages • Require operator risk assessment to ensure use of appropriate technical options, including identification of sensitive areas • Require that all reasonable measures are taken to avoid discharges to surface water bodies

Potential adverse effects	Risk factor	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
	• Non-point fertiliser – dust	mixing sites • Disposal to water	good ballistic properties (particle size).	• Classify water bodies as sensitive areas • Require that label requirements are followed
• Contamination of groundwater	• Concentration of fertiliser and application rates • Soil type – highly permeable and fertilisers that are mobile	Indirect: • Leaching through soil Direct: • Spillages/ overflows at loading sites • Inappropriate disposal Direct and indirect: • Inappropriate disposal of wastes	• Management of loading sites • Ensure that client has established appropriate rate, concentration gradient for the soil profile • Methods of disposal	• Require that loading sites in proximity to wellheads be managed to ensure that spillages are contained
• Contamination of soils/ land	• Fertilisers that are, or contain substances not mobile in soil • Inappropriate application rates • Inadequate containment at loading sites	Indirect: • Permeability – water moves nutrients through soil profile but contaminants eg: Cd and F remain bound to soil particles Direct: • Frequency and rate of application of fertiliser	• Follow use requirements • Ensure that client has established appropriate rate, for the soil profile • Loading sites, and storage	• Require that use requirements are followed • Ensure management of loading sites to contain spillages
• Amenity values	• Proximity of people –	Indirect:	• Minimising potential for	• Classify amenity areas as

Potential adverse effects	Risk factor	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
	timing and location • Fertiliser volatility and toxicity class • Aircraft operating	• Off target drift Direct: • Exposure if public in public areas at time of application Noise: • Aircraft and machinery	drift – technical options (Refer Technical Overview of the Agricultural Aviation Industry*)	*sensitive areas* • Plan provisions relating to reverse sensitivity in rural areas – including noise and drift to benchmark what is to be reasonably expected in the rural area
• All potential adverse effects			• Competent to carry out risk assessment for operation	• Require pilot competency through Pilots Agrichemical Rating issued by CAA and the operator to be AIRCARE™ accredited for fertilisers.

* Section 4 pg 87 http://www.fertqual.co.nz/files/downloads/aerialapp02.pdf

6.5 Possible plan provisions for aerial discharges of fertiliser

Given that no two applications of fertiliser are the same it is difficult, and somewhat problematic, to write prescriptive rules that attempt to apply appropriate requirements to fit every situation given the range of variables (e.g. application equipment, location, wind conditions, and product). The recommended approach is therefore a plan framework that requires best management practices to be adopted and a risk assessment approach be undertaken. This approach enables operators to establish the potential for adverse effects based on the circumstances of the application, and to implement best management practices to avoid or mitigate potential adverse effects.

Relevant and appropriate best practice standards that can be incorporated into plan provisions include:

- **The Fertiliser Group Standards**- provides for the safe use of fertiliser products to protect human health and the environment. A permitted activity condition recognising approvals under these standards provides an appropriate level of control over the potential adverse effects of fertiliser storage and use, when applied in combination with industry best practice.
- **AIRCARE™ accreditation**- provides assurance that the industry best management practices are being used by the pilot. The pilot will have the required qualifications so it is not necessary for the plan to specify qualifications but simply refer to accreditation.
- **Requirement to keep records** – records should be kept so that in the event of an incident or complaint the council is able to access information to be able to investigate the complaint.

Refer to Appendix A for suggested plan provisions to manage the aerial discharge of fertiliser based on a risk management approach.

7. Agrichemicals

The term 'agrichemical' is the common term used to describe a range of substances that are used to control pests. Agrichemicals are applied to land, water or crops to control pests in primary production activities of pastoral farming (sheep, beef, dairy and deer), horticulture, viticulture and forestry. Examples of agrichemicals include:

- herbicides to control unwanted plants, including some that are specific for aquatic use in water;
- insecticides to control insects such as clover flea or potato psyllid; and
- fungicides to control fungus e.g. rust, mildew, moulds.

Agrichemicals are usually discharged into air rather than applied directly onto the target species so under the RMA such applications are classed as a discharge of contaminants to air, land or water. Agrichemical applications can be by both fixed wing aircraft and helicopters, and vary due to a range of factors so plan provisions need to be appropriate, flexible and applicable across the range of situations. Aerial application of agrichemicals range from total vegetation control (e.g. pre-plant herbicide application in cropping and forestry) where confining the spray to the target area is the first priority through to application of a biological insecticide as a biosecurity requirement (e.g. Painted Apple Moth eradication in Auckland). In that case, large

urban areas were sprayed small spray droplets in specific local wind conditions to get the required target penetration and coverage.

7.1 Definition of Agrichemical

The terms agricultural chemicals, agricultural compounds and pesticides are often used to describe the same or similar groups of products. The terminology and definition used in a plan is important so it is clear exactly what substances fall within the parameters of any regulation. The most commonly used definition in RMA plans is the definition from NZS 8409 2004Management of Agrichemicals which defines agrichemicals as:

> *"Any substance, whether inorganic or organic, man-made or naturally occurring, modified or in its original state, that is used in any agriculture, horticulture or related activity, to eradicate, modify or control flora and fauna. For the purposes of this Standard, it includes agricultural compounds but excludes fertilisers, vertebrate pest control products and oral nutrition compounds."*

This definition is considered to be an appropriate definition to incorporate into plan provisions.

The HSNO Act refers to pesticides rather than agrichemicals. Pesticides are defined under the HSNO regulations and include any chemical mixture of substances intended for preventing, destroying or controlling any pest. Pesticides include a wider range of substances than the definition of agrichemical in NZS8409. For example, VTA's or timber treatment chemicals would be classed as a pesticide, but not an agrichemical as defined in NZS8409. For other definitions of fertiliser see the Technical Overview of the Agricultural Aviation Industryhttp://www.nzaaa.co.nz/ on the NZAAA website.

7.2 Aerial Application of Agrichemicals

Aerial application of agrichemicals involves mixing the active substance with water in a spray tank according to the rate and concentration specified on the product label. It is then applied using a boom fitted to the aircraft that has the appropriate number and type of nozzles fitted. The nozzles regulate the flow rate and determine the droplet size produced. Getting an even spray pattern from an aircraft, whether fixed wing or helicopter, depends on the way in which the spray boom and nozzles are mounted on the aircraft.

Most aerial spraying of agrichemicals in New Zealand involves herbicide application where it is important to ensure maximum deposition onto the target, while minimising off-target drift. The application equipment used, the way this equipment is fitted and the type of aircraft can significantly affect the extent to which off-target drift is minimised.

Sometimes a different technique is needed, where lateral movement of small droplets in the spray is used to obtain large swath widths and horizontal droplet deposition. Examples of this technique in New Zealand include fungicide application to broad-acre crops and control of pest incursions such as the Tussock Moth and Painted Apple Moth. This technique can produce very good target coverage but containing such spray in the target area is more difficult.

There are existing industry best practice standards for agrichemical application. The most relevant is NZS 8409 2004 Management of Agrichemicals (NZS8409).This performance

standard applies to any agrichemical application, including by aerial methods. NZS8409 was developed by Standards New Zealand and sets out the requirements for the safe, responsible and effective management of agrichemicals.NZS8409 is also one of the Codes of Practice that form part of the AIRCARE™ Accreditation programme

7.3 Risk factors of aerial application of agrichemicals

There are a number of potential adverse effects that can arise from agrichemical applications and the nature of these effects will vary depending on the combination and level of risk factors for the operation. The relevant risk factors for the discharge of agrichemicals include:

- the chemical being used, hazard class and type, and exposure to it;
- the concentration and rate of application of the chemical;
- the timing of the application;
- location of sensitive activities;
- the proximity of people – timing and location;
- the location of the application and use, including mixing sites;
- weather conditions;
- spray quality;
- target identification; and
- the permeability of the soil.

In seeking to avoid or minimise adverse effects from the discharge of agrichemicals, these risk factors need to be assessed and addressed in the context of the relevant exposure pathways.

7.4 Exposure pathways and management options

The exposure pathways for agrichemicals can be either

- Indirect – off target drift, leaching, overland flow; or
- Direct – application on subject areas, point source discharges (e.g. spillages).

7.4.1 Off target drift - Spray drift and drift hazard

Drift hazard is defined in NZS 8409:2004 as the hazard associated with drift and consequent trespass which may result in an adverse effect to human health animal health or the environment.

Every spray application of agrichemicals will result in some degree of spray drift as it is not possible to have zero drift due to the range of variables. However, the most important issue from a risk management perspective is what risk does the spray drift pose and how can these risks be avoided or minimised.

The Technical Overview of the Agricultural Aviation Industry on the NZAAA website includes a potential draft hazard scale from NZS8409:2004. This table highlights the range of variables that need to be considered such as wind speed and direction, height and application and sensitive areas. It also identifies ways to address these hazards which requires knowledge of all the variables that are relevant to the agrichemical application at the time. Table 5.2.5 distinguishes between pre-determined and real time factors and identifies that the most

significant factor causing adverse effects from off target spray drift is almost always wind direction – a real time factor.

Plan provisions relating to the discharge of agrichemicals need to ensure that they recognise these options so that they are assessed at the time of application. (Refer Appendix A)

7.5 Management options for the discharge of agrichemicals

The risk management section sets out the general framework for a risk management approach for aerial applications. This section provides guidance on how to apply this approach specifically to manage the discharge of agrichemicals. For each potential adverse effect, the table below identifies the relevant risk factor, exposure pathway and management options to manage potential adverse effects for both the pilot and councils. The extent to which a risk factor applies and management options need to be considered varies according to the nature of the receiving environment and the potential adverse effect.

Table 7.1 Risk management approach for aerial application of agrichemicals

Potential adverse effects	Risk factors	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
Health effects caused or possible: • Allergic reactions • Irritations • Toxic poisoning • Exposure to carcinogens and teratogens	• Hazard class of chemical being used and exposure (Class 6 and 9)	Indirect: • Off target drift Direct: • Applicator	Indirect: • Minimising potential for drift – technical options • Notification (drift hazard) Direct: • PPE	• Require operator risk assessment to ensure use of appropriate technical options • Classify dwellings, educational facilities and public places as sensitive areas • Require notification where application adjacent to sensitive areas
• Contamination of crops and plants including sensitive crops and organically farmed properties. Effects include: • Growth and quality of the crop • Contamination to levels in excess of residue levels • Threatens organic registration	• Chemical type (herbicide, insecticide, fungicide etc.) • Excessive residue levels • Timing of application – crop stage • Application rate (calibration)	Indirect: • Off target drift	• Minimising potential for drift – technical options	• Require operator risk assessment to ensure use of appropriate technical options including identification of sensitive crops and methods to avoid drift onto those areas • Classify crops and non-target plants as sensitive areas • Require notification to greenhouse operations in the area
• Contamination of domestic or commercial water supplies	• Chemical type and hazard class	Indirect: • Off target	• Minimising potential for drift – technical options	• Require operator risk assessment to ensure use of appropriate

Potential adverse effects	Risk factors	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
where it renders the drinking water non-potable		Direct: • Discharges		technical options • Classify water supplies as sensitive areas • It may be appropriate to include conditions to avoid direct applications over such areas
• Contamination of indigenous flora and fauna, habitat areas and reserves where the inherent values of the areas are damaged or lost	• Ecotoxicity of substance 9.3A and 9.4A • Poor or no target identification • Spray quality	Indirect: • Off target drift Direct: • Applications	• Minimising potential for drift – technical options • Target site ID (GPS) • Controls by hazard classification eg 9.3 and 9.4.	• Require site identification as part of risk assessment • Require operator risk assessment to ensure use of appropriate technical options • Classify as sensitive areas • Controls by hazard classification (eg 9.3 and 9.4)
Contamination of wetlands, surface water body and coastal and marine environments where it causes: • Death of flora, fish or other fauna • Water takes affected leading	• Chemical type and hazard class 9.1A, 9.3A or 9.4A • 6.1A, 6.1B or 6.1C • Concentration of chemical and application rates	Indirect: • Applications adjacent to water bodies – off target drift or overland flow • Disposal	• Minimising potential for drift – technical options • Target site ID (GPS) • Controls by hazard classification eg 9.3 and 9.4. • Management measures	• Require reasonable measures be taken to avoid discharges to surface water bodies unless for intended aquatic use and operator risk assessment undertaken to establish reasonable measures and ensure use of appropriate

Potential adverse effects	Risk factors	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
to un-potable water or damage to crops and animals	• Location of application in proximity to water take points • Inappropriate disposal • Poor or no target identification • No ID of at- risk water bodies • Non- point spray quality	adjacent to water Direct: • Applications into water • Spillages/ overflows at mixing sites • Disposal to water	of mixing sites – NZS8409 Sec 5.3.2 and App R • Management of disposal – NZS8409 Sec 6 and App 6	technical options • Classify water bodies as sensitive areas • Ensure that label requirements are followed. • It may be appropriate to include conditions to avoid direct applications over such areas • Use of substances approved for aquatic use and HSNO controls.
• Contamination of groundwater	• Concentration of chemicals and application rates • Soil type – highly permeable and chemicals that are mobile	Direct: • Spillages/ overflows at mixing sites Indirect: • Leaching through soil Direct and indirect: • Inappropriate disposal of unwanted agrichemicals and surplus spray mix	• Management measures of mixing sites – bunded etc. NZS8409 Sec 5.3.2 App R • Appropriate rate, concentration, gradient, soil profile (GROWSAFE calculator) • Methods of disposal NZS8409 Sec 6 and App S	• Require compliance with NZS8409 Sec 6 and App S and Sec 5.3.2 and App R

Potential adverse effects	Risk factors	Exposure pathway	Pilot Management options	Options for plan provisions and consent conditions *Refer to Appendix A*
• Contamination of soils/ land	• Use of substances that persist and accumulate in the soil – e.g. copper 9.2A • Inappropriate application rates • Inadequate containment at storage and mixing sites	Direct: • Frequency and rate of application of persistent chemicals 9.2A Indirect: • Permeability – includes water source to mover through the soil profile	• GROWSAFE calculator • NZS8409 App F Fate processes • Mixing sites and storage NZS8409 Sec 4 App L	• Meet label requirements • Require that NZS8409 Sec 4 and App L are met.
• Amenity values Offensive and/or objectionable effects such as: • Limiting access to public areas • Off target drift other than health and vegetation damage • Excessive noise	• Proximity of people – timing and location • Chemical – volatility and toxicity class • Air craft and machinery operating	Direct: • Exposure if in public areas at time of application • Off target drift • Noise – aircraft and machinery	• Minimising potential for drift – technical options • Notification (drift hazard)	• Classify amenity areas as *sensitive areas* • Plan provisions relating to reverse sensitivity in rural areas – including noise, odour, spray drift to benchmark what is to be reasonably expected in the rural area
• All potential adverse effects			• Competent to carry out risk assessment for operation.	• Require pilot competency through Pilots Agrichemical Rating issued by CAA and the operator to be AIRCARE™ accredited for agrichemicals.

7.6 Possible plan provisions for application of agrichemicals

The recommended approach to develop plan provisions for agrichemicals is based on a risk management approach. Such an approach is not dependent on the method of application but rather the assessment of the risks associated with the operation so the rule covers all forms of application and situations based on the relevant risk factors. A possible plan rule suggested for agrichemical use is set out in Appendix A. The rule is intended to apply to all users who must also complete a spray plan to determine any sensitive areas in close proximity to the proposed application. If there are sensitive areas near where spraying is to occur then there are additional requirements in the rule for those activities.

8. Aerial application of VTA's

Vertebrate Toxic Agents (VTAs), commonly known as baits, are substances that are used to kill, control or limit vertebrate pest animals, including possums, rat, rabbits and mustelids. These substances are sometime known as vertebrate pest control products and include products that have a negative effect on reproduction, but do not include attractant or repellent substances that are not toxic. VTA's include baits containing sodium fluoroacetate (1080), soluble concentrate containing sodium fluoroacetate (when mixed with food bait), and baits containing pindone and brodifacoum. This guidance note provides guidance on managing the most common aerial application of VTAs – 1080 applied as cereal bait or carrots, and pindone. It does not address applications of other VTA's by other methods.

8.1 VTA Definition

Vertebrate toxic agents (VTA's) means any substance, whether inorganic, human made or naturally occurring, modified or in its original state, that is used to eradicate, modify or control vertebrate animals, including possums, rats and mustelids. VTA's are regulated under the Hazardous Substances and New Organisms Act 1996and includes vertebrate pest control products as identified (but not defined) in NZS 8409:2004 Management of Agrichemicals.

8.2 Aerial application of VTAs

The most common form of aerial application of VTAs is 1080 and Pindone. Aerial applciation of 1080 usually involves the 1080 substancecontained within tcereal bait or it is added as a soluble concentrate on sitewith carrot bait. Bait containing 1080 is principally used to manage possums in the Conservation estate to protect indigenous flora and fauna and also on primary production land to control possums as vector carriers of TB to cattle. Rabbits are also controlled by 1080 and Pindone. Brodifacoum is used to control rat and mice populations, typically on islands. DOC (Department of Conservation) have Standard Operating Procedures (SOP's) that are required to be met in any 1080 operation.

Other relevant best practice for the aerial application of VTAs includes the Code of Practice for the Aerial Application of Vertebrate Toxic Agents. This code provides guidance on the safe and responsible aerial application of 1080 cereal and carrot baits and pindone. The Code forms part of the AIRCARE™ Accreditation programme. Note that management of VTAs is not included within NZS8409: 2004 Management of Agrichemicals so the Standard is not an appropriate management tool for VTA's.

8.3 Risk Factor of aerial application of VTA

The level of risk can be determined by combining the likelihood (highly improbable through to extremely likely) with the magnitude (minimal /minor/moderate/major/massive) of the adverse effect. For more information on assessing the level of risk for application of VTAs see EPA 1080 reassessment Table C1 pg. 203) and the Technical Overview of the Agricultural Aviation Industry.

Note that hazard classifications for sodium fluoroacetate (1080) and formulated substances containing 1080 are given in Section 7 pg. 33 of the EPA 1080 reassessment (refer www.epa.govt.nz and www.nzaaa.co.nz)

8.4 Management options for the aerial application of VTAs

Under the RMA the application of VTA's is a discharge of contaminants to air, land or water so these discharges should be managed through provisions in Regional Plans Because of the hazards

associated with VTA's, the former Environmental Risk Management Authority (now the Environmental Protection Authority (EPA) undertook a reassessment of 1080 in 2007. This assessment provides full information on the product, risks and controls which must be met by operators and identified that existing hazardous substance controls are adequate to control the adverse effects of 1080 on public health. This assessment also recommended that more effort should be put into ensuring that the existing controls are complied with by all users of 1080 through implementation of best practice guidelines and standards. For more information, see the 1080 webpage on the EPA website.

The EPA risk assessment requires controls on the use of 1080 and the use of such substances is closely regulated through HSNO. RMA plan provisions should therefore align with the HSNO controls to avoid duplication of regulation. Any additional controls should only be used to address a resource management issue that is not adequately addressed in the EPA controls.Also note that while both VTA's and agrichemicals are classed as pesticides under HSNO, because of the nature of the products they require different management regimes so regional and district plans should have separate requirements for VTA's and agrichemicals.

The risk management section sets out the general framework for a risk management approach for aerial applications. This section provides guidance on how to apply this approach specifically to manage the discharge of VTAs.

The following table sets out a risk management approach for use of VTAs. It is based on the ERMA (now EPA) reassessment of 1080 in 2007. For each potential adverse effect, the table identifies the relevant risk factor, exposure pathway and management options to manage potential adverse effects.

Table 8.1 Risk management approach for VTA (1080) use

Potential adverse effects	Risk factor*	Exposure pathway (Nature of risk)	Pilot Management options	Options for plan provisions and consent conditions
Adverse human health effects (both short and long term)	B Minor/ Improbable	Exposure of occupationally exposed persons during the handling of soluble concentrate during the manufacture and handling of treated carrot and apple baits in the field. Nature of risk: a) The risk is voluntary; b) The risk will not persist over time (exposure is not on-going and the effect will not persist across generations since 1080 is not mutagenic); c) The risk is not uncontrolled in scope and location; d) The potential effects may be irreversible but information was incomplete on this aspect; e) There is good understanding in the occupational setting for managing exposure (e.g. protective equipment) and little risk of public exposure.	Ensure all personnel involved have and use appropriate PPE.	Compliance with HSNO controls will prevent excessive exposure.
Effects following direct exposure to pellets during aerial operations and coated baits on: a) native birds b) native mammals (bats) c) native herpetofauna (frogs and lizards)	A – D* D A-C	Nature of risk: a) Exposure of organisms to the substance is involuntary b) The risk will not persist over time as 1080 is biodegradable c) The effects are not uncontrollable (or controllable?) and would be irreversible only in the event of the loss of a species or a significant population d) Risks are generally well understood by users of formulated substances containing 1080 and can be managed, but are less well understood by the general public	• Ensure accurate GIS mapping of target area • Clearly identify target area boundaries and water bodies • Avoid flight outside target area while undertaking the operation • Don't apply bait	Given the existing and new HSNO controls and recommendations, all users of substances containing 1080 shall follow and adopt best practice

			outside the target area	

* = See 1080 reassessment Table C1 pg 203

8.5 Possible plan provisions for application of VTAs

Application of VTA's is tightly regulated under HSNO by the EPA so the provisions for discharging VTAs in regional plans should align with these controls and not duplicate the requirements that already apply. Conditions in rules should cover the following matters:

- The pilot shall hold a HSNO Controlled Substance License issued by EPA.
- The discharge shall not contravene any requirement specified in the Ministry of Health Permit and any other consent.
- For aerial discharges the discharge shall comply with AIRCARE™ Code of Practice for The Aerial Application of Vertebrate Toxic Agents 1st November 2011 or relevant Standard Operating Procedures (DOC).

See Appendix A for a suggested plan provision to manage the effects from the aerial application of VTAs.

9. Land based issues associated with agricultural aviation

This section outlines amenity issues and potential adverse effects associated agricultural aviation activities undertaken on land and associated management options to address these issues. It is focused on three main issues:

- aircraft noise;
- storage, loading and mixing; and
- reverse sensitivity.

9.1 Aircraft noise

The main source of potential adverse effect on amenity is from the aircraft noise associated with the application of substances, whether that is from an aeroplane or a helicopter. Often the potential for adverse effects is related to reverse sensitivity in rural areas where there is an objection to the noise of the aircraft operating in the area from more sensitive activities.

There are more than 3300 aeroplanes and 800 helicopters in New Zealand and approximately 110 aeroplanes and 190 helicopters are involved in agricultural aviation work. All of these aircraft will operate near noise sensitive areas at times which have the potential to cause amenity issues. The potential for adverse noise effects from agricultural aviation flights is also related to the outcomes the operator is seeking to achieve which means the aircraft needs to be flown continuously at low level to achieve predictable positioning of the products being discharged. This requirement creates a potential issue in that the potential noise nuisance from low flying aircraft is much higher than aircraft flying more than 1000 feet above ground level. Additionally, all the helicopters and some aeroplanes will routinely use unlicensed landing areas that are referred to as 'Informal Airports' which can result in adverse effects and complaints when there are sensitive activities located in close proximity to those sites.

It is important to remember that the RMA does not control noise of aircraft in the air. Unless an aircraft is taking off or landing the RMA jurisdiction can only be applied when amenity values of an area are diminished. See Noise management in mixed-use urban environments guidance note for more information.

The aviation sector is conscious of the limited cover of legislation and has developed a best practice standard that reduces the adverse effects from aircraft noise. The AIRCARE™ accreditation includes noise abatement which provides measures for an operator to reduce the effects of noise. Requiring

that an operator is AIRCARE™ accredited is therefore an appropriate means to ensuring that noise abatement methods are used.

If a district plan seeks to manage the potential noise impacts of aerial operations then consideration needs to be given to areas where the aircraft operate. It is important to recognise that use of aircraft for applications of agrichemicals, fertilisers and VTAs are intermittent activities – the farmer, grower or forester is not using the aircraft every day. Adequate provision should therefore enable the use of rural airstrips and landing areas for such intermittent use at appropriate times On the other hand, aircraft bases are used on an on-going basis and plan provisions will need to reflect this. To help manage further conflict and complaints about aircraft noise, plans should also include provisions to manage reverse sensitivity in rural areas where the agricultural aviation industry is an established activity. For example, this may include setback areas around established landing strips and aircraft bases

9.2 A risk management approach to manage the potential adverse effects of aircraft noise

The risk management section sets out the general framework for a risk management approach for aerial applications. This section provides guidance on how to apply this approach specifically to manage the potential adverse effects of aircraft noise from the agricultural aviation industry.
For each potential adverse effect, the table below identifies the relevant risk factor, exposure pathway and management options to manage potential adverse effects.

Table 9.1 Risk assessment approach for managing the potential adverse effects of aircraft noise

Potential adverse effects	Risk factor	Exposure pathways	Pilot Management options	Options for plan provisions and consent conditions
• Noise nuisance for rural inhabitants • Offensive and/or objectionable effects such as excessive noise	• No direct risk to rural inhabitants • Direct risk to aircraft operators by limiting activities	Direct: • Location of the aircraft	• Identify sensitive areas and avoid these where possible • Minimise potential noise nuisance by varying the flight path, operating quiet aircraft types, operating aircraft as quietly as possible	• Provide for agricultural aviation operations as part of primary production activities • Include provisions for reverse sensitivity
• Noise nuisance to stock when aircraft operating at low level • Offensive and/or objectionable effects such as excessive noise	• Stock may take fright and become injured	Direct: • Stock see and hear aircraft	• Identify sensitive areas and avoid these where possible • Minimise potential noise nuisance by varying the flight path, operating quiet aircraft types, operating aircraft as quietly as possible • Notify affected parties when possible	
• Noise nuisance for rural inhabitants – small holdings Amenity values: • Offensive and/or objectionable effects such as excessive noise	• No direct risk to rural inhabitants • Direct risk to aircraft operators by limiting activities • Aircraft operating	Direct: • Location of the aircraft	• Identify sensitive areas and avoid these where possible • Minimise potential noise nuisance by varying the flight path, operating quiet aircraft types, operating aircraft as quietly as possible, operate aircraft at times landowners are absent (at work) • Notify affected parties when	• Provide for agricultural aviation operations as part of primary production activities • Include provisions for reverse sensitivity

Potential adverse effects	Risk factor	Exposure pathways	Pilot Management options	Options for plan provisions and consent conditions
			possible • Plan provisions relating to reverse sensitivity in rural areas – including noise, drift of fines to benchmark what is to be reasonably expected in the rural area	
• Noise Nuisance for Public or Crown Land Amenity values: • Offensive and/or objectionable effects such as excessive noise	• No direct risk to visitors • Direct risk to aircraft operators by limiting activities • Aircraft Operating	• Noise	• Identify sensitive areas and avoid these where possible • Minimise potential noise nuisance by varying the flight path, operating quiet aircraft types, operating aircraft as quietly as possible • Notify affected parties when possible • Get agreement from entity with jurisdiction where it is acceptable to operate	• Provide for agricultural aviation operations as part of primary production activities • Include provisions for reverse sensitivity • Classify public areas as sensitive areas
• All potential adverse effects			• Competent to assess noise abatement methods for operation	• Require pilot competency through pilot having Certificate in Aircraft Noise abatement and the operator to be AIRCARE™ accredited for noise abatement

9.3 Storage, loading and mixing sites

As part of and prior to the aerial application of fertilisers, agrichemicals and VTAs there is general a need to store these substances, mix these substances as required and then load them onto the aircraft. These activities have the potential to cause adverse effects if not appropriately managed and contained. There are a number of HSNO controls that apply with respect storage and handling of hazardous substances. They are based on the hazard classifications and quantity to be stored including requirements for Approved handlers, Location test certificates, Fire extinguishers, Signage, and Emergency response plans and secondary containment. See the EPA publication on threshold guidance for more information. Storage of hazardous substances is a land use issue managed by district councils. Some councils have taken a prescriptive approach of specifying thresholds over which storage of a substance would require resource consent. When managing the potential adverse effects of storing hazardous substances on site, it is important to align with and not duplicate existing controls for storage.

In relation to the following substances, the following standards are relevant:

- **Fertilisers**: Fertilisers are approved under the HSNO Group Standards for Fertilisers so it is considered appropriate that storage complies with these requirements. A possible provision for a district plan is therefore "*Permitted activity for the storage and use of fertiliser in accordance with Fertiliser Group Standards*".
- **Agrichemicals -**NZS8409:2004 Management of Agrichemicals includes requirements for agrichemical storage which are best practice and consistent with HSNO. If storage complies with these requirements additional requirements should not be necessary through a district plan and this could be reflected through a permitted activity rule.

9.4 Reverse sensitivity

Reverse sensitivity is the term used to describe the sensitivity of some activities to other lawfully established activities in the vicinity. The Environment Court has provided the following interpretation of reverse sensitivity:

> *It is when sensitive activities [usually, but not always, residential activities] seek to establish within a range of a lawfully established, effect emitting, industry or activity, so that management may become difficult. This is the concept known as reverse sensitivity.[refer Winstone Aggregates v The Matamata - Piako District Council (W0055/2004, Environment Court, Auckland)]*

. The key is that any definition used in a plan is clear about where the sensitivity lies and the effect that it can have on lawfully established activities. It is also important that plans include agricultural aviation operations as part of primary production activities so that it is clear that they are part of the established activity.

In terms of agricultural aviation activities people may be sensitive to the noise, dust and spray effects that are generated by the aerial operations. Such sensitivity can lead to complaints and attempts to restrict or curtail the operation, even in established rural areas. Often complaints are directed at the aerial operator as the name or number of the aircraft can be determined, rather than to the landowner who has engaged the aerial operator.

As noted in the industry regulations and best practice section, there is a range of industry best practice and standards that operators use to ensure that the adverse effects of their application are minimised. However, this may not be sufficient for many people, particularly those residents new to rural areas who see the

operations as an imposition on their lifestyle. In addressing such complaints, it is important to recognise that the aerial operations are generally intermitted in nature with the application short term and only occurring on a limited number of days in any year.

Many regional and district plans include provisions relating to reverse sensitivity, especially in the rural area. It is important that noise, including aircraft noise, is included in such provisions. The plan should also identify established activities in rural areas and the types of effects that can reasonably expected, including the potential adverse effects from aerial applications where appropriate. A policy framework that establishes that rural production activities, including aerial airstrips and operations, are part of normal rural production activities in the area then enables the activity and any complaints to be assessed in that context. For example, some plans include a description of rural character to establish what activities and effects can be anticipated in the rural area. Councils can also use non-regulatory methods such as information to landowners and notices on LIMs to draw landowners attention to activities that can reasonably be expected in rural areas.

10 Glossary

Buffer Zone	The distance between an identified sensitive area and the downwind edge of where an application is occurring.
Bunded	An area which has a raised perimeter to prevent the escape of any spills
Controlled swath width	Defined distance across the spray pattern from a single pass
GROWSAFE®	Registered trade name of the NZ Agrichemicals Education Trust and name of the training course associated with NZS8409:2004 Management of Agrichemicals
Notification	Advising an affected party that an application or operation is to occur
NZS8409	New Zealand Standard 8409:2004 Management of Agrichemicals
Off target drift	The movement of airborne substances as droplets, vapour, solid particles or dust away from the target area.
Operator	The organisation undertaking an operation. The operator may be a sole operator/ pilot or a larger organisation with a number of pilots.
PPE	Personal Protective Equipment (e.g. gloves, respirator)
Reverse sensitivity	Reverse sensitivity is when occupants of an activity complain about the effects of an existing lawfully established activity. This can have the effect of imposing economic burdens or operational limitations on the existing activity thereby reducing their viability.
Risk factor	The possible reasons why an adverse effects could occur
Spray quality	The spray droplet size dependent on the nozzle used. Nozzle manufacturers will provide information on spray quality while the technical specifications are set out in Spray Nozzle Classification by Droplet spectra ANSI/ASAE S572.1 March 2009
Spray plan	Spray plan means: a Spray plan prepared consistent with NZS8409: 2004 Management of Agrichemicals Section 5.3 and Appendix M4. A template can be found on the GROWSAFE website www.growsafe.co.nz
Swath	The width of deposition from a single pass of an aircraft
Waterbody	RMA definition – means fresh water or geothermal water in a river, lake, stream, pond wetland or aquifer or any part thereof that is not located within the coastal marine area.

APPENDIX A – POSSIBLE PLAN PROVISIONS TO MANAGE THE EFFECTS OF THE AERIAL APPLICATION OF FERTILISERS, AGRICHEMICALS AND VTAs

Recommended definitions and references for plan provisions

A 1 Operational risk assessment

The permitted activity conditions require a risk assessment to be undertaken for the activity to be undertaken. It is recommended that this be included in the rule or as a schedule or appendix in a Plan.

A risk assessment should address the following matters:

1. Target identification- where application is to occur- detailing location and boundaries
2. Identification of *sensitive areas* in relation to target area including nature of sensitivity in relation to the operation being undertaken e.g. fertiliser dust near residential areas.
3. Product to be applied – rate/ product physical properties or quality and hazards associated with the product e.g. propensity for drift, ballistic qualities, HSNO classification
4. On-site real time weather conditions – wind speed, wind direction,
5. Optimum operational practice – release height, speed, equipment to be used
6. Operational constraints – e.g. physical hazards – such as poles, buildings, wires, shelter belts
7. Taking all these factors into account determine:
    a. Quantify where the product will go given all parameters - model if required
    b. Risk of drift and consequences – risk profile
    c. Select appropriate measures to reduce potential, such as: (not in order of importance)
        i. Ensure appropriate application equipment – e.g. spreaders to ensure no significant departure above or below required mean application rate
        ii. For fertilisers ensure fertiliser physical properties compatible with application systems used
        iii. Setback distances from sensitive areas
        iv. Only apply when wind direction is away from sensitive areas
        v. Amend operational practice - e.g. reduce fertiliser release height especially near downwind edge of the application site
8. How reassessment throughout the operation will be undertaken – to assess change in circumstances and adjustment to operation.
9. How actions will be document to verify what has been done

Assessment matters if resource consent required:

- *A risk assessment of the activity, including the above matters, shall be provided that demonstrates how adverse effects on sensitive areas will be avoided*
- *Location of the loading and mixing sites, in particular proximity to water bodies*
- *Evidence of competency of the applicators/ pilot*

Sensitive areas

Sensitive areas include:

- Residential buildings
- Educational facilities

- Public places and amenity areas where people congregate
- Domestic and community water supplies
- Water bodies and associated riparian vegetation
- Crops which are sensitive to agrichemicals or faming systems (eg organic farms, greenhouses)
- Wetlands, indigenous vegetation habitat areas and reserves
- Public roads

A1 Suggested rule and conditions for the aerial application of fertilisers

The following provides a potential example of permitted activity conditions for the aerial application of fertiliser that may be incorporated into plan provisions.

The application of fertiliser by air is a permitted activity provided it meets the following conditions:

a. *The application is undertaken by an AIRCARE™ accredited operator*
b. *The pilot undertakes a risk assessment *of the area and weather at the time of application to ensure that sensitive areas are avoided and all reasonable measures are used to minimise drift and provide to council if requested (*Refer to the risk assessment information in the guideline)*
c. *Product specification recommendations are met*
d. *Storage, mixing and loading sites meet the requirements of the HSNO Group Standards for fertilisers and are managed to contain spillages.*
e. *The pilot must record details of the application including:*
    - *Location of the application site*
    - *Date of application*
    - *Fertiliser applied, including trace elements and other additives*
    - *Application rate (kg/ha)*
    - *Written daily flight logs*
    - *Verification of tracks flown*
    - *Weather conditions at time of application including wind speed and direction*

Such records to be made available to the Council on request.

Where permitted activity conditions cannot be met and resource consent is required, the activity could either be controlled or restricted discretionary, with the matters for control or discretion specified and linked to the permitted activity conditions where there is non-compliance.

In addition, to support this rule, definitions should be included for sensitive areas and fertiliser to provide clarity and certainty. A definition or requirements for operation risk assessment should also be provided although this may be incorporated into the rule, explanation or schedule rather than provided as a specific definition. The recommended wording of these terms is set out in the definition section of this guidance note.

A2 Suggested rules and conditions for agrichemical use

(It should be noted that these provisions are designed for aerial use so domestic use in not included.)

The discharge of **agrichemicals** into air or onto land where it may enter water is a Permitted Activity subject to the following conditions:

All applications:

1. *There must be no significant adverse effects from off target spray drift beyond the boundary property.*

2. *The rate of application should not exceed rates of application specified on the agrichemical label or contravene any label requirements*

3. *There must be no direct discharges to waterbodies or human drinking water sources.*

4. *The discharge shall be undertaken in a manner consistent with NZS8409:2004 Management of Agrichemicals and for specific activities compliance with the following sections of NZS8409: 2004 Management of Agrichemicals:*
    - *Storage – Appendix L4*
    - *Use – Part 5.3*
    - *Disposal – Appendix S*
    - *Records – Appendix C9*

5. *Spray plan*

    The owner/ occupier or manager shall:

    i. *Prepare a spray plan in accordance with NZS8409:2004 5.3 and Appendix M4 at least once a year including identifying sensitive areas adjacent to where discharges will occur*
    ii. *Notify adjoining neighbours that a spray plan is available on request at least 7 days before first application; and*
    iii. *Supply a copy of spray plan to any person or property identified as a sensitive area and likely to be directly affected by the applications and who requests a copy of the spray plan.*
    iv. *Supply a copy of the spray plan to the applicator to enable risk assessment to be undertaken.*

6. *Training*

    All users of agrichemicals must know what to do, and shall hold qualifications according to the task:

    a) *Where the application is undertaken by a contractor for hire and reward the following qualifications must be held:*
        i. *Ground based application:*

            Either

            GROWSAFE® Registered Chemical Applicators Certificate

            Or:

            GROWSAFE® Introductory Certificate and under direct supervision of GROWSAFE® Registered Chemical Applicator

        ii. *Aerial application –the pilot must hold a current GROWSAFE® Pilots Agrichemical Rating Certificate issued by CAA and the application company or operator must hold a current AIRCARE™ Accreditation.*
    b) *All other users (other than domestic) must hold a GROWSAFE® Introductory Certificate or be under direct supervision of a person holding a GROWSAFE® Applied Certificate or Registered Chemical Applicators Certificate.*

7. *Storage*

    Storage must meet the requirements in NZS8409:2004 Management of Agrichemicals Appendix L4 to ensure that agrichemicals are effectively contained to the site and the site is secure.

8. *Mixing site*

    Mixing agrichemicals must meet the requirements in NZS8409:2004 Management of Agrichemicals 5.3.2 to ensure that there is no spillage from the site or contamination of water sources or land.

9. *Records*

    All users must keep records consistent with Appendix C9 of NZS8409:2004 Management of Agrichemicals as evidence and information that provides an authentic record to verify that the storage

and use of agrichemical(s) has been carried out in a safe responsible manner, in particular with respect to the means by which risks associated with spray drift have been minimised, and agrichemicals are contained to the storage and mixing site. Such records must be provided to council when requested.

NOTE: The storage and use of agrichemicals is subject to specific requirements under the Hazardous Substances and New Organism Act 1996 and pursuant Regulations which may cover the person in charge, training, signage, storage and emergency management.

A2.1 Applications adjacent to sensitive areas

In addition to the requirements for all applications, where the discharge will occur adjacent to sensitive areas identified in the spray plan then the following must be undertaken:

10. *The applicator shall undertake a risk assessment prior to the application to ensure that adequate measures are in place to avoid adverse effects on the sensitive area(s).*

11. *Applications shall only occur when the wind direction is away from the sensitive area.*

12. *The application equipment shall be configured to produce a spray quality no finer than coarse (See note below).*

13. *If conditions 11 and 12 cannot be met then the applicator must take alternative steps to avoid off target spray drift and document the steps taken. Such steps could include:*
    - *Spray drift reduction adjuvant added to spray*
    - *Reduce spray release height*
    - *Increase droplet size (spray quality)*
    - *Use spray modelling software to predict the outcome.*

    (Refer to the Drift Hazard Chart in NZS8409 for more details.)

14. *Notification:*

    The owner/ occupier or manager shall ensure that notification has occurred prior to application commencing as follows:

    a) *Sensitive areas other than amenity areas and public places:*
    The owner/ occupier or manager of the property where agrichemicals are to be used is to ensure that any person likely to be directly affected by application and who requests notification, is notified prior to application commencing, by:

    EITHER:
    Written, telephone or email notification of intent to spray at least 24 hours prior to the proposed application, unless there is an alternative agreed timeframe between the parties.

    OR:
    If more practicable provide notice publicly, such as local newspaper or letter drop at least 7 days prior but no more than 1 month before proposed application

    b) Amenity areas and public places

The owner/ occupier or manager shall provide a public notice in a local newspaper or letter drop in the area to be sprayed at least 7 days before the proposed application and ensure that the signage below is provided:

i) Where spraying is occurring in a public place signs shall be placed within the immediate vicinity of the spraying prior to commencing and maintained until spraying has ceased,
ii) Where the spraying is occurring on or alongside roads vehicles associated with the spraying shall display signs on the front and rear of the vehicles advising that spraying is occurring.

Note - Spray Quality
Spray droplet size from a nozzle is important because it determines spray target coverage and deposition as well as the amount of losses from spray drift. The term 'spray quality' is used to compare different nozzles with respect to spray drift. NZS8409:2004 Appendix Q Application Equipment sets out information about spray quality and nozzles and what equipment will produce a coarse spray quality. Nozzle manufacturers will provide information on spray quality while the technical specifications are set out in Spray Nozzle Classification by Droplet spectra ANSI/ASAE S572.1 March 2009.

If one or more of these conditions cannot be met agrichemical use becomes a restricted discretionary activity and will require resource consent from Council.

Definitions

In addition to the definition of sensitive areas, other definitions that would assist with interpretation of this rule are agrichemical and spray plan. Refer to the definition section for recommended definitions of these terms.

A3 Restricted Discretionary Activity

If the conditions of the permitted activity rule cannot be met then consent as a restricted discretionary activity would be required. The following is an appropriate list of matters of discretion to be considered.

Matters of discretion

When assessing an application for discharge of contaminants into air, or onto or into land or water from the use or application of agrichemicals, the matters to be considered are:

(a) The type of agrichemical to be discharged, including its toxicity and volatility and the carrying agent (formulation);
(b) The proposed method of application, including the type of spray equipment to be used, the spray volume and droplet size, the direction of spraying and the height of release above the ground;
(c) The nature of any training undertaken by the operator;
(d) Measures to avoid agrichemical spray drift;
(e) The extent to which the use or application complies with NZS8409:2004 Management of Agrichemicals;
(f) The proximity of the use or application to a waterbody or potable water including roof water;
(g) The timing of application in relation to weather conditions; and
(h) Communication requirements.

Aquatic use

It is necessary to provide for applications of agrichemicals direct to water for managing aquatic weeds. As applications direct to water are a specific type of application they have been separated from other applications of agrichemicals. There are a limited number of substances that can be used for such purposes and it is suggested that those undertaking such activities should be specifically trained for that use.

Rule for application of agrichemicals direct to water for aquatic purposes.

The discharge of agrichemicals directly into water is a Permitted Activity subject to the following conditions:

1. The substances, including any adjuvants, are approved by EPA under the HSNO Act for discharge directly into or onto water and must comply with requirements covering the person in charge, training, signage, storage, emergency management and all other requirements under the Hazardous Substances and New Organisms Act 1996 and pursuant Regulations

2. The person authorising the discharge direct to water shall notify:
   i. Every person taking water for potable supply within 1km downstream of proposed discharge at least 12 hours prior to discharge occurring; and
   ii. Every resource consent holder for taking of water for public potable water supply purposes downstream of proposed discharge at least 1 week before commencing discharge.
   iii.
3. Qualifications
   Discharge of agrichemicals directly into or onto water can be carried out only by persons holding:

   EITHER:

   a) a GROWSAFE® Registered Chemical Applicators Certificate (National Certificate in Agrichemical Aquatic strand)

   OR

   GROWSAFE® Introductory Certificate and under direct supervision of a person holding a GROWSAFE® Registered Chemical Applicator Certificate (National Certificate in Agrichemical Aquatic strand)

   b) Aerial application –the pilot must hold a current GROWSAFE® Pilots Agrichemical Rating Certificate issued by CAA and the application company must hold AIRCARE™ Accreditation

   Where spraying is occurring in a public place signs shall be placed within the immediate vicinity of the spraying prior to commencing and maintained until spraying has ceased.

4. Records
   All users must keep records consistent with Appendix C9 of NZS8409:2004 Management of Agrichemicals as evidence and information that provides an authentic record to verify that the application of agrichemical(s) directly to water has been carried out in a safe responsible manner, in particular with respect to notification of any person who may take water for their own use. Such records must be provided to council when requested.

NOTE: The discharge of agrichemicals directly into water is subject to specific requirements under the Hazardous Substances and New Organism Act 1996 and pursuant Regulations.

If one or more of these conditions cannot be met use of agrichemicals directly to water becomes a restricted discretionary activity and resource consent will be required from Council.

The following diagram **Fig A1** sets out visually how the recommended Permitted Activity rule for agrichemical use would work. There are effectively two categories; all applications; and applications adjacent to sensitive

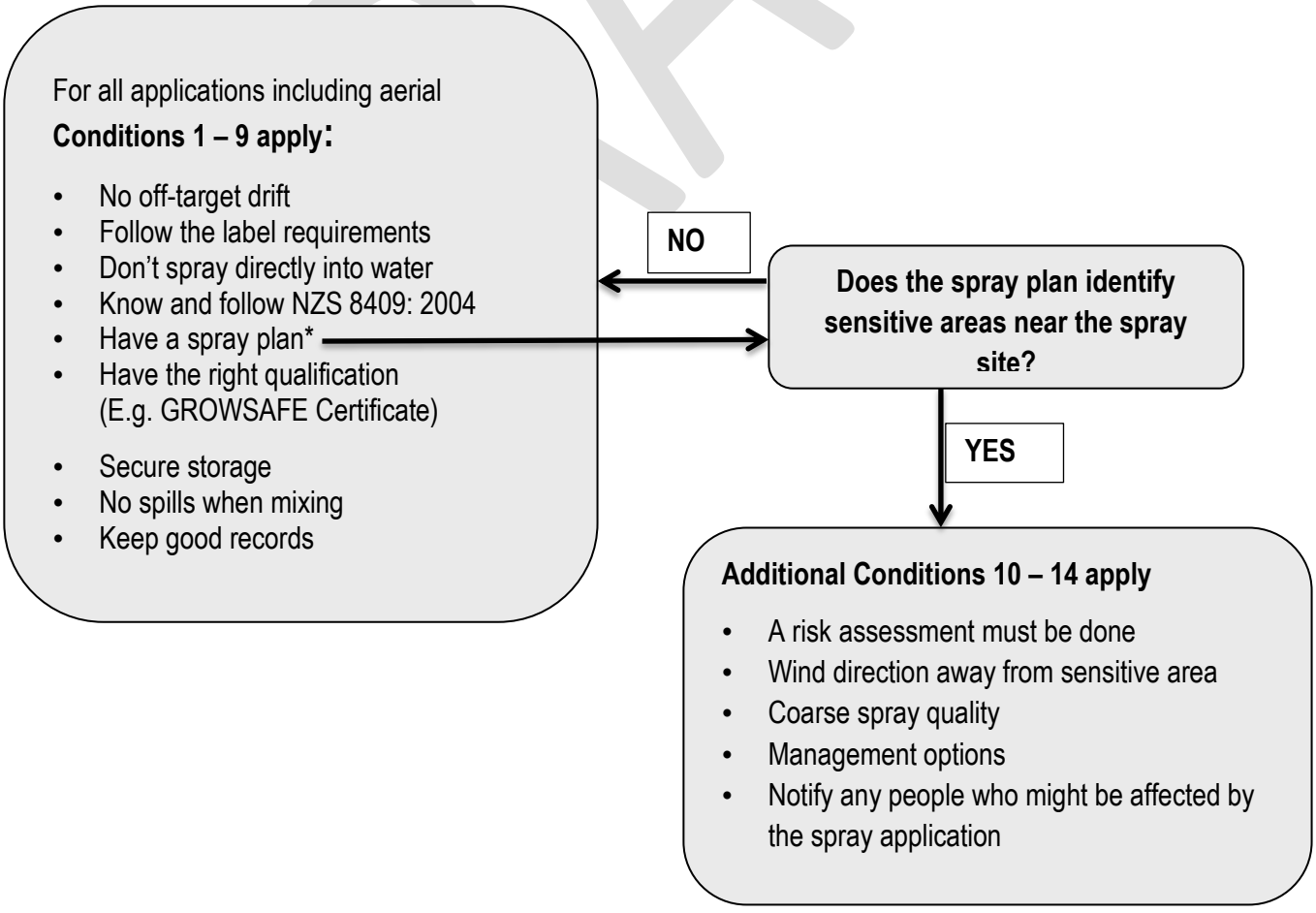
areas. The required conditions cascade depending on the nature of the use and the presence of sensitive areas and the diagram can be used to show how the requirements apply.

The rule is dependent on a clear definition of sensitive areas as this determines whether conditions 10-14 apply. The recommended definition of sensitive areas is based on NZS8409:2004 'Management of Agrichemicals' which is provided in the definition section. It includes areas where there is potential for significant adverse effects from off-target agrichemical spray drift based on the proximity of spraying to where people are located or the environment is sensitive such as water bodies or other crops. These are the areas where additional measures need to be undertaken to ensure that the risk of off-target drift is assessed and appropriate steps taken to avoid such risks.

A separate possible rule for applications of agrichemicals direct to water is included. There are a limited number of substances that can be used for such purposes and it is suggested that operators undertaking such activities should be specifically trained for that use.

Are you applying agrichemicals?

If yes, follow the chart to determine what requirements you need to meet.
Note: If you are applying direct to water refer to specific rule for Aquatic Use



A3 Suggested rules for vertebrate toxic agents VTA (Bait)

The discharge of vertebrate toxic agents into air, onto land, or onto land where it may enter water is a permitted activity subject to the following conditions:

1. *All discharges:*
   a) *The discharge must comply with requirements covering the person in charge, training, signage, storage, emergency management and all other requirements under the Hazardous Substances and New Organisms Act 1996 and pursuant Regulations.*
   b) *The discharge must not exceed rates of application or contravene any requirement specified for aerial application of the product.*

2. *Applications by hand or ground based equipment:*
   a) *There must be no discharge beyond the boundary of the subject property;*
   b) *There must be no direct discharge into any water body;*
   c) *Where the discharge occurs in an amenity area or public place signs shall be erected prior to the application commencing and maintained until the application has ceased and all baits removed or have become non-toxic.*
3. *Applications from aircraft:*
   a) *All 'reasonable measures' must be taken to prevent any discharge of vertebrate toxic agents:*
      (i) Beyond the boundary of the subject property and;
      (ii) Within 10 m of any lake or wetland which has an area of 1 ha or more and;
      (iii) Within 10 m of the wetted bed of a river, lake or artificial watercourse that is more than 3 m wide and;
      (iv) Within a coastal marine area; and
      (v) Within a group or community drinking water supply protection area
   b) *Where the discharge is located within 50 metres of a sensitive area listed in this plan notice of the discharge must be provided to adjacent landowners and occupiers at least 7 days and not more than 20 days before application and must include the following information:*
      (i) the period when the application will occur
      (ii) the trade name and the chemical name to be used
      (iii) method of application (Fixed wing or helicopter)
      (iv) safety precautions to be taken
      (v) the name and contact phone number of those carrying out the application

      A record of this notification must be kept and made available to the council upon request.

   c) *Where the discharge occurs in an amenity area or public place signs shall be erected prior to the application commencing and maintained until the application has ceased and all baits removed or have become non-toxic.*

   Under condition (a) "reasonable measures" may include the use of GPS technology, positive airflow indicators on boundaries or direct boundary supervision by qualified personnel.

NOTE: The discharge of vertebrate toxic agents is subject to specific requirements under the Hazardous Substances and New Organism Act 1996 and may require the approval of the Medical Officer of Health and the Department of Conservation.

If one or more of these conditions cannot be met then the use of VTA's becomes a restricted discretionary activity and resource consent will be required from Council.

Restricted Discretionary Rule
Application of vertebrate toxic agents not complying with Permitted Activity rule is a Restricted Discretionary Activity

Discretion is restricted to:

(a) The location, nature, scale, timing and duration of the activity
(b) The nature of the sensitive area adjacent to the discharge
(c) Any beneficial effects of the discharge
(d) Any effects on those species which are not the target of the discharge
(e) Any adverse effects or risks to human health or public use of the area
(f) Any relevant national regulations or nationally-accepted guidelines or codes of practice.
(g) Duration of consent and consent conditions
(h) Compliance monitoring

Resource Consent applications under this rule will not be publicly notified.