



Rivers Section

HANDBOOK FOR SPRAYING

*For Resource Consents CRC981580 and
CRC041535*

January 2021

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INTRODUCTION

The Spray Handbook is a tool available to assist in consent compliance and good practice for use of agrichemicals across the Canterbury Region to help minimise the risk of harm arising from the use of agrichemicals. It has been prepared for use by Rivers Section staff or contractors carrying out spraying to control vegetation growing in riverbeds and drains. The contents of this handbook must be understood by these people prior to carrying out the work as they are responsible for meeting all the relevant requirements. A copy of this handbook must be carried in all vehicles and machinery involved in spraying.

Spraying is authorised by resource consents CRC981580 and CRC041535. These consents set out the minimum requirements for carrying out spraying and specify that spraying must be carried out in accordance with this Handbook.

The Handbook is split up into the main stages of the job – Preparation, Before Leaving the Depot, On the Job and After the Job. It sets out work practices for how spraying must be conducted to avoid environmental harm, and also covers topics such as sampling, health effects and the conditions of our Resource Consents.

The use of sprays should be carefully considered, and only used where it is the best practicable option for controlling weedy vegetation. All of the substances we are authorised to use are toxic to the aquatic environment, with some toxic to terrestrial and soil life as well, so need to be extremely carefully managed.

In general, there are three main locations sprays are used for flood protection and drainage maintenance:

Fairway Spraying:

Spraying is carried out to control the growth of woody and herbaceous weeds including willow, broom, alder, lupine and gorse in the 'active' part of the river channel, the "fairway", which carries fast flowing water during floods.

Controlling this vegetation is needed to ensure that the flood carrying capacity of the river is not reduced, nor flows redirected out of the flood channels causing erosion and damage to land, and flood protection structures and plantings on the river berms. Further vegetated islands can “lock up” gravel and prevent natural braiding from occurring which impacts on the natural character and habitat value of braided rivers.

Berm spraying:

Old Mans Beard and other weed species such as blackberry, gorse and broo, are sprayed in the berm vegetation, as these noxious weeds smother and kill willows. Berm spraying also includes maintenance spraying of stopbanks and tracks. Stopbanks need to be kept clear of woody weeds, as the roots of those weeds penetrate into the stopbank potentially causing weaknesses in the stopbank. Tracks are maintained to ensure that there is easy access through the river berms for our operational works, and at times of flood for inspections.

Drain Spraying:

Vegetation control in drainage scheme is necessary as weed growth restricts water flow causing water levels in the drain and adjacent groundwater levels to rise, impeding drainage and ultimately causing localised flooding. The target vegetation on the banks of such waterways are the introduced woody plants such as gorse, broom and sprouting willow. Within the waterways, the target vegetation are emergent introduced species such as monkey musk, water twitch and water cress, which thrive in the nutrient rich drain environment. Diquat may also be used in certain locations to control submergent weed. Also sprayed are plants such as dock and rank grass growth in dry drains. The first preference is to only spray dry drains, however this is not always possible.

Spraying may be carried out by knapsack, truck or tractor mounted hand held spray guns or aerial spraying via helicopters. The spray methodology will be determined taking into account site characteristics, size of the spray job, accessibility and practicality.

BEFORE COMMENCING THE JOB – Job set up checks by the Engineer

1. Ensure that spraying is the best option to be used for weed control, consider mechanical or hand clearance of weeds where possible.
2. PLAN – create a job sheet for the spraying that takes into account both environmental and health and safety matters. This will show the locations of key features such as schools, camp grounds and water intakes that spray operations need to avoid
3. Check that the specification for the work and the relevant consent conditions are understood by all members of the spraying team.
4. Confirm that all **schools** and **camping grounds** located within 250m of any land to be sprayed via aerial application (CRC981580 only) have been advised of the intention to spray at least five days prior to spraying.
5. **For the Ashburton Depot:** Te Taumutu Rūnanga must be notified at least five working days prior to the commencement of each spraying event in the riverbeds of the following rivers or their tributaries;
 - a. Selwyn River;
 - b. Rakaia River;
 - c. Main Branch of Ashburton River;
 - d. North Branch of Ashburton River.
6. Identify any **community drinking water supply** draw-off points located within 250m of the proposed spray zone. A publicly or privately owned drinking water supply (via surface water, infiltration gallery or shallow well) is defined as one that serves more than 25 people per year for at least 60 days per year.
7. If spraying is proposed within 250m of the public supply bores in the Waimakariri District Council area confirm that the council has been notified at least five working days prior to the commencement of

spraying (CRC981580). A plan showing the location of the bores is held by the Kainga Area Supervisor.

8. Check the **HotSpots List and spawning time calendar** to check whether the waterway you are going to spray is in a hot spot area for the time of spraying (this is for spraying areas under CRC041535 only). If the area to be sprayed is in a Hot Spot and time for fish spawning, consultation must be undertaken with The Department of Conservation, Ngai Tahu and Fish and Game New Zealand prior to any spraying occurring.
9. Identify the location of any **beehives** near the spray area – contact the local beekeeper.
10. Ensure that spraying is not planned to be undertaken on **public holidays, or weekends before or after a public holiday**
11. Make sure you have sample bottles if sampling has been scheduled for the site – *see Sampling Requirements for further details.*
12. Check that that the chemicals to be used are currently approved for use under the Hazardous Substances and New Organisms Act and any subsequent replacement or legislation (including the Health and Safety at work (Hazardous Substances) Regulations 2017).

BEFORE LEAVING THE DEPOT

1. Check that all members of the spraying team know what to do in the event of spills - what to do on site and who to report the spill to (Spill Response Plan Appendix 6) and for first aid and medical assistance.
2. Check safety equipment for condition and fit. PPE required for spraying includes overalls, gumboots, gloves, eye protection and respiratory protection.
3. Ensure that clean fresh water and soap is carried on the spray vehicle for hand washing.

4. Check that the necessary number of signs warning of spraying are on the spray vehicle. The signs must state that spraying is in progress, proposed duration of the spraying including starting and finishing dates, whether it is aerial or ground-based spraying, active herbicide chemical and surfactant (if any) being used. They must be capable of being read at a distance of five metres.
5. Check the weather forecast and consider the time of day that spraying is carried out to avoid the amount of possible spray drift and impacts on pollinating insects.
6. If needed, make sure you have something that can be used to rope off or demarcate the site to create a work zone that public can be excluded from.
7. Check that the quantity of chemicals carried will be sufficient for the day's spraying and no more than needed for the day. Ensure that vehicle loading and transportation of hazardous substance requirements are met (note this means transporting NO MORE than 250L or KG of chemical – both diluted and concentrated).
8. Check that the chemical containers are closed and not leaking on the vehicle. Ensure that they are stowed/secured on the vehicle so that there is no chance of them falling off or moving around.
9. Identify potential sources of water for mixing chemical.
10. Check calibration of equipment and check back flow prevention is in place and fully functional on the pump.

ON THE JOB

1. Plan your route so that vehicles and machinery discharging herbicides do not enter river channels containing flowing water within 250m upstream of any community water supply draw-off point, or do not pass within 25m of any community water supply draw-off point.

2. Do not aerially apply any herbicide within 250m of any community water supply draw off point, schools or dwellings.
3. Do not apply any herbicide within 25m of any community water supply draw off point by ground-based application methods.
4. For drain spraying, do not spray:
 - within 25 metres upstream of an intake for a water supply that is not used for domestic or community water supply purposes; or
 - within 250 metres upstream of an intake for a water supply that is used for domestic or private water supply purposes; or
 - within 1 kilometre upstream of an intake for a water supply that is used for community water supply purposes (unless the owner of the water supply has given written approval for you to spray closer than 1 kilometre).
5. Apply Triclopyr to bankside vegetation and margins only and triclopyr must not be sprayed directly onto water.
6. Avoid native vegetation and do not spray bank side vegetation within inanga spawning habitat (check Job Sheet for any inanga spawning location).
7. Avoid spraying drains with water in them as far as practicable, consider other clearing methods or delay the spraying if the drain normally dries up.
8. Direct spray away from water.
9. Ensure that all mixing of spray chemicals and cleaning of spray equipment is undertaken in an area sufficiently away from any surface waterbody to ensure that spillage does not discharge into any surface waterbody.
10. Ensure that the filling of tanks when diluting concentrated herbicides is carried out in a manner that prevents back-flow. The filling procedures

and back flow prevention devices and methods should fully comply with the Water Supplies Protection Regulations 1961.

Note: The Water Supplies Protection Regulations can be viewed at <http://www.legislation.govt.nz/regulation/public/1961/0086/latest/DLM15439.html>

11. Erect and maintain signs where people normally obtain access to the spray area. Block off public access if necessary, to avoid harm to public or staff on site.
12. Do not discharge surfactant onto plants in flower if there is signs of bees foraging on those plants.
13. Do not spray within 50 metres of any beehive or of any bird nesting or rearing its young on the bed or bank of the watercourse.
14. Assess wind speed using an acceptable method at the commencement and during the day's operation. Do not spray whenever wind speeds are greater than 10 kilometres per hour. Do not spray when wind conditions are such that spray drift onto non-target areas is likely to occur.
15. The operator in charge for each spraying unit must fill out the daily work in progress log book. The log book must be kept up to date and present with the operator for inspection at any time. The information to be recorded shall include:
 - Operators names
 - Start and finish time of application
 - Detailed description of the area sprayed
 - Target plants
 - Chemical and additives used (including manufacturer's name), mixing rate, and locations where mixing was carried out
 - Method of application
 - Target plant condition
 - Estimated wind speed and direction
 - Weather conditions

- Rain (start/finish time)
 - Any fish present (dead or alive)
15. Carry out all spraying using a method and equipment that minimises the risk for spray drift beyond the target area to cause a hazard so that public safety is ensured at all times.
 16. Do not spray when vegetation is wet from rain or when rain is forecast to fall in the area being sprayed within:
 - 2 hours for glyphosate with surfactant
 - 6 hours for glyphosate without surfactant
 - 1 hour for triclopyr with surfactant
 - 3 hours for triclopyr without surfactant.
 16. Triple rinse spray containers back at the depot and tip rinsing's into the spray tank or a knapsack. Do not tip rinsing's into the stormwater network, into a waterbody or onto the ground. Old containers to be disposed of at an appropriate facility.

AFTER COMPLETION OF THE JOB

1. Ensure that the log book of the day's spraying activities is completed if not already done. Hand copies of the log book in to Depot Administration for filing.
2. Put triple rinsed empty containers in the designated storage area.
3. Ensure that all safety equipment is cleaned and maintained.
4. Carry out any maintenance on the spray equipment.
5. Wash any spray drift off the spray vehicle/ trailer/ tractor.
6. Replace used overalls (disposable) or put them in for washing (cotton)

QUALIFICATIONS REQUIRED

In 2017 the legislation managing the use of agrichemicals was split between the Health and Safety at Work Act (2015) and the Hazardous Substances and New Organisms Act, overseen by Worksafe and the Environmental Protection

Agency. This change saw a change to what qualifications applicators are required to hold, and their level of training and competency.

Glyphosate (the current formulations in use) does not trigger any certification requirements, however Triclopyr and Diquat does require qualifications to be held.

Under the EPA Hazardous Property Controls Notice, substances that are very ecotoxic to the aquatic and terrestrial environment (class 9.1A, 9.2A, 9.3A and 9.4A) are required to be under the control a “Qualified Person/Contractor”. “Under the control of” means either being *applied by* a qualified person or *under the direct or indirect supervision* of a qualified person as appropriate based on the skills and experience of the applicator and the nature of the task.

Qualifications required for ground-based application are:

Application Method	Growsafe Certification	Alternative
Motorised application equipment (not handheld) eg Boom or air-blast sprayer	Growsafe Standard	or US 21563 and one of US23620, US27216, US23617, US6239, US6236, US6242
Motorised application equipment – handheld with a tank capacity of more than 30L eg Gun-spraying, mist blower	Growsafe Standard	(or US21563 and one of: US27216, US6237, US6238
Motorised application equipment- handheld within 30m of water or sensitive habitat eg Motorised knapsack, gun-spraying, near	Growsafe Standard	or US 21563 and one of: US27216, US6237 and US6238

water or sensitive habitat		
All applications in to water eg spraying aquatic weeds	Growsafe Standard and US6240	or US21563 and US6240

Knapsack or other non-motorised techniques do not trigger specific qualifications.

For Contractors:

Application Method	Growsafe Certification	Alternative
Motorised application equipment (not handheld) eg Boom or air-blast sprayer	Growsafe Registered Chemical Application (RCA) with relevant strand	N/A
Motorised application equipment – handheld with a tank capacity of more than 30L eg Gun-spraying, mist blower	Growsafe Registered Chemical Application (RCA) with relevant strand; OR Growsafe Standard and one of US27216; US6237; US6238	National Certificate in Agrichemical Application with relevant strand; OR US21563 and one of: US27216; US6237; US6238
Motorised application equipment- handheld within 30m of water or sensitive habitat eg Motorised knapsack, gun-spraying, near water or sensitive habitat	Growsafe Registered Chemical Applicator (RCA) with relevant strand; OR Growsafe Standard with one of:	National Certificate in Agrichemical Application with relevant strand; OR US21563 and one of: US27216; US6237; US6238

	US27216; US6237; US6238	
All applications in to water eg spraying aquatic weeds	Growsafe Registered Chemical Applicator (RCA) with aquatic strand	N/A
All other ground based application eg non-motorised, motorised handheld with capacity of less than 30L and not near water or sensitive habitat	Growsafe Standard	US21563 and US27215

It is recommended that at least one person at each depot holds the appropriate level of qualification (Growsafe Standard and/or relevant Unit Standards). Those operating under supervision (direct or indirect) should hold a minimum of the Growsafe Basic certificate or equivalent training.

For aerial spraying, under the Civil Aviation Rules the application of agrichemical by aircraft requires the pilot to hold a Pilot Chemical Rating. This rating lasts for 5 years initially and requires renewal.

For UAV/drone spraying, under the Civil Aviation Rules the application of agrichemicals by a UAV requires the applicator to be certified under Part 102 and have an endorsement (privilege) for agriculture. This is issued by the Civil Aviation Authority (CAA).

PROTECTING BEES and POLLINATORS

Bees and other pollinating insects are critical to life on Earth and the productivity of New Zealand's agriculture and horticulture industry.

Agrichemicals can have major impacts including bee death, contaminated honey, reduced pollination.

Surfactants we add to the herbicide to increase its effectiveness will cause bee deaths if bees come in to contact with either spray drift or visit flowers that have recently been sprayed. The surfactant works on the bees body like it does the plant leaf, essentially causing the bee to suffocate. Be aware that the most spray additives *do not* have label warnings about the effects on bees.

It is important that we have steps in place to protect these pollinators when spraying.

As such it is critical we do not spray within 50m of bee hives to reduce the risk of spray drift affecting large numbers of bees. We must also not spray plants in flower when there are bees foraging. These are both consent requirements and not negotiable.

Other good practices that should be followed:

- Time spraying to avoid the warmer parts of the day – bees are less active during cooler mornings so less chance of bees being out foraging.
- Carry out spray operations after December, beekeepers typically move their hives out of the river berms and into farmland later in summer.
- Do not spray when wind speeds increase the risk of spray drifting

MANAGING HEALTH AND SAFETY RISKS

Both the applicators and Environment Canterbury have responsibilities to ensure that the risks associated with the use of agrichemical are managed. Environment Canterbury has procedures and plans in place to ensure the risk of harm from agrichemical use is minimized as far as reasonably practicable.

This includes the provision of information about the risks of the chemicals being used (via safety data sheets and job plans), emergency response plans, provision of training and the provision of appropriate personal protective equipment.

Workers applying agrichemicals are responsible for ensuring that they manage the risks to their own health and safety and that of their colleagues by applying agrichemicals in accordance with good practice and the manufacturers recommendations.

A note on glyphosate:

In March 2015 Glyphosate was reclassified by the World Health Organisation/International Agency for Research on Cancer as “Group 2A”, where 2A means that the agent is probably carcinogenic to humans. This category is used when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. Previously glyphosate was considered as a substance that does not pose a cancer risk to humans.

In August 2016 the New Zealand Environmental Protection Agency released a report on the review of the evidence relating to the carcinogenicity of glyphosate. The review found that glyphosate is unlikely to be genotoxic or carcinogenic to humans and does not require reclassification under the HSNO Act.

Glyphosate is a thoroughly tested substance and is still safe to use provided all safety precautions are taken to prevent inhalation or skin contact. Such measures must also be used for all other chemical use. This means wearing gumboots, protective overalls, fitted spray masks, gloves and safety glasses. If overalls have covered with spray if possible, take these off before getting into vehicles to minimise chances of the chemical absorbing into seat covers and the interior of the vehicle. Seat covers should also be routinely washed in the spray vehicles.

Do not eat, drink or smoke while using chemicals. Remove protective clothing and wash hands and face thoroughly before meals and after work. Wash protective clothing daily after work.

SAMPLING REQUIREMENTS

Both CRC981580 (for rivers, streams and creeks) and CRC041535 (for drainage networks) require water quality sampling when spraying.

Sample bottles and sample submission forms can be obtained from the Christchurch Office, samples are sent to Hills Laboratories in Christchurch.

Hills Laboratories are located at 101C Waterloo Road, Hornby.

The following notes apply over the whole region:

When spraying in rivers, a minimum of **5** areas where spraying has occurred over an area greater than 0.5ha shall be sampled each year across the region. These 5 areas must include:

- At least two areas where triclopyr has been used
- At least two areas where glyphosate has been used

If one or the other chemical is not being used, then all 5 samples will be for areas where the single chemical has been applied.

In areas where triclopyr has been used three water samples are taken for each area as follows:

1. ONE immediately upstream sample pre spraying
2. ONE within 25m downstream sample after spraying is completed
3. ONE within 25m downstream sample within 40 days of completion of spraying, but after a rainfall event.

Note: Keep sample #1 at the depot but send samples #2 and #3 to the lab for processing.

In areas where glyphosate has been used two water samples are taken for each area as follows:

1. ONE immediately upstream sample pre spraying
2. ONE within 25m downstream sample after spraying is completed.

Note: Keep sample #1 at the depot but send sample #2 to the lab for processing.

When spraying in drains, a minimum of **6** areas where spraying has occurred over an area greater than 0.5ha shall be sampled each year across the region. Sampling of both the spray mix and receiving environment water is required. These 6 areas must include:

- At least two areas where triclopyr has been used
- At least two areas where glyphosate has been used
- At least two areas where diquat has been used

If a chemical(s) have not been used, then all 6 samples will need to be taken for areas where the other chemical(s) have been used.

In areas where triclopyr has been used three water samples are taken for each area as follows:

1. ONE immediately upstream sample pre spraying
2. ONE within 25m downstream sample after spraying is completed
3. ONE within 25m downstream sample within 40 days of completion of spraying, but after a rainfall event.

Note: send all samples the lab for processing.

In areas where glyphosate has been used three water samples are taken for each area as follows:

1. ONE immediately upstream sample pre spraying

2. ONE within 25m downstream sample after spraying is completed.
3. ONE within 25m downstream sample within 72 hrs of spray completion

Note: send all samples to the lab for processing.

In areas where diquat has been used three water samples are taken for each area as follows:

1. ONE immediately upstream sample gel application
2. ONE within 25m downstream sample after gel application is completed
3. ONE within 25m downstream sample between 12-72hrs after gel application is completed.

Note: send all samples to the lab for processing.

To ensure we are undertaking sampling in accordance with consent requirements and obtain a representative picture of the effects of spraying, sampling has been split geographically as follows:

FOR RIVER SPRAYING of areas greater than 0.5ha:

TWO areas must be sampled in the South Engineering patch;
ONE area must be sampled in the Central Engineering patch;
ONE area must be sampled in the Waimakariri; and
ONE in the Northern Engineering Patch

FOR DRAIN SPRAYING of areas greater than 0.5ha:

ONE area must be sampled in the South Engineering patch
TWO areas must be sampled in the Central Engineering patch
ONE area must be sampled in the Waimakariri Patch
TWO areas must be sampled in the Northern Engineering patch

The drain/river to be sampled will be indicated on the Annual Spray Program and bottles will be sent to the depots in advance of the scheduled spraying.

EMERGENCY RESPONSE

In the event of an accident or emergency, immediately inform the Overseer or Contractor in Charge. If required, the appropriate official emergency services must be alerted and/or summoned immediately.

1. Spill

Everything possible must be done to contain spillage and prevent any herbicide from entering waterways, ponds, lakes, drainage systems or the sea. If the spill is near drinking water supply intake, you must notify the owner and the operator of the supply immediately. Follow the procedures outlined in the Spill Response Plan.

2. Drift

In the event of any spray drift incident beyond the target area immediately notify all potentially affected parties. These at minimum shall include affected landowners, the relevant territorial authority, Environment Canterbury, the Medical Officer of Health, the relevant local Rūnanga within whose takiwā the incident occurred when areas for mahinga kai are in the area, the Department of Conservation area office, and the MAF Regulatory Authority (Enforcement Unit). See telephone list in Appendix 9.

If stock are at risk, the owner should be contacted directly to take appropriate measures. If the Overseer or Contractor in Charge cannot make immediate contact, staff should act promptly to prevent stock losses by moving them away from affected areas.

3. Human contact

First Aid measures for Glyphosate

Never give fluids or induce vomiting if patient is unconscious or is having convulsions.

Ingestion: Do not induce vomiting. Call a physician. The decision of whether to induce vomiting or not should be made by a physician.

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician.

Skin Contact: Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

Inhalation: Remove to fresh air. Consult a physician

First Aid measures for Tricolpyr

Eyes: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

Skin: Wash off in flowing water or shower.

Ingestion: Do not induce vomiting. Give large amounts of water or milk if available and transport to medical facility. Do not give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air if effects occur. Consult a physician.

APPENDIX 1

CRC981580 CONSENT CONDITIONS

1. The herbicides and surfactants shall be discharged in accordance with the:
 - i) "Quality Control Plan for the Discharge of Herbicides to Control Fairway Vegetation"; and
 - ii) "Safety Procedures and Contingency Plan" , attached to this consent.

2.
 - i) The discharge shall only be of proprietary formulations containing the herbicides glyphosate or triclopyr as the active ingredient.
 - ii) Additives to these herbicide formulations shall only be surfactants added in accordance with the manufacturers' instructions.

3. There shall be no discharge of surfactant onto plants in flower where honey bees are likely to be present, if it has been demonstrated in field or laboratory tests and reported in published material that the surfactant is toxic to honey bees when discharged in accordance with the manufacturer's instructions.

4. The application rate and concentration of any herbicides and surfactants discharged shall not exceed the chemical manufacturers' recommended rate for the product.

5. Only herbicides that are currently registered for the purpose of weed control under the Hazardous Substances and New Organisms Act 1996 or any succeeding legislation shall be discharged.

6. Triclopyr shall not be discharged over water.

7. The concentrations of herbicides in surface waters within 25 metres downstream of spray zones shall not exceed the following:

Glyphosate	0.1 grams per cubic metre
Triclopyr	0.01 grams per cubic metre

8. Herbicide shall be discharged in a manner that complies with the "Agrichemical User's Code of Practice and Appendices", NZS8409:1999, or any versions of that document current at the time of discharge.
9. (i) The consent holder shall identify, prior to discharging herbicide in a spray zone, the location of all community drinking water supply draw-off points located within 250 metres of that spray zone.
 - (ii) There shall be no aerial discharge of herbicides within 250 metres of any community surface water supply draw-off point.
 - (iii) There shall be no land-based discharge of herbicides within 25 metres of any community surface water supply draw-off point.
 - (iv) Vehicles and machinery discharging herbicides under this consent shall not enter river channels containing flowing water within 250 metres upstream of any community surface water supply draw-off point.
 - (v) Vehicles and machinery discharging herbicides under this consent shall not pass within 25 metres of any community surface water supply draw-off point.
 - (vi) For the purpose of this consent a community drinking water supply draw-off point shall be defined as a publicly or privately owned drinking-water supply (via surface water, infiltration gallery, or shallow well) which serves more than 25 people per year for at least 60 days per year.
10. There shall be no discharge within the hatched area shown on the attached plan "CRC981580-Rangiora Water Wells".
11. There shall be no discharge on public holidays or on any weekend that immediately precedes or follows a public holiday.
12. There shall be no aerial spraying of herbicide within 250 metres of any school or dwelling.
13. A copy of this resource consent shall be given to all persons undertaking activities authorised by this consent prior to commencing works.

Notification of spray programme

14. (a) Annual spray programmes for all areas to be sprayed in the following year shall be prepared by 1 August each year. The spray programmes shall detail the:
- (i) areas of operation;
 - (ii) chemicals to be used;
 - (iii) spray methods to be used;
 - (iv) likely starting date and duration of the spraying; and
 - (v) contact person and telephone number for enquiries.
- (b) By 1 September of each year the consent holder shall submit a copy of the annual spray programme to:
- (i) The Compliance Monitoring Section of the Canterbury Regional Council
 - (ii) the relevant territorial authorities;
 - (iii) the Rūnanga within whose rohe spray operations will occur;
 - (iv) the Te Ngai Tūāhuriri Resource Management Committee;
 - (v) Crown Public Health;
 - (vi) Fish and Game New Zealand - North and South Canterbury;
 - (vii) the Canterbury Beekeepers Association; and
 - (viii) the relevant Eel Management Committee for the area (Te Waihora, South Canterbury/Waitaki or North Canterbury/Marlborough).
15. The consent holder shall notify the Te Taumutu Rūnanga at least five working days prior to the commencement of each spraying event in the riverbeds of the following rivers or their tributaries;
- (i) Selwyn River;
 - (ii) Rakaia River;

(iii) Main Branch of Ashburton River; and

(iv) North Branch of Ashburton River.

16. The consent holder shall notify the Waimakariri District Council at least five working days prior to the commencement of any herbicide spraying event within 250 metres of the public supply bores identified on the attached plan "CRC981580- Waimakariri Public Supply Wells".
17. Prior to spraying herbicide the consent holder shall erect and maintain signs at places where people normally obtain access to the spray area. The notices shall be capable of being read from a distance of five metres and shall be maintained for the duration of the spraying. The notices shall state:
- (i) that spraying is in progress,
 - (ii) the proposed duration of the spraying, including starting and finishing dates,
 - (iii) whether it is aerial or ground-based spraying; and
 - (iv) the active herbicide chemical and surfactant, if any, being used.
18. The consent holder shall provide a report to the Canterbury Regional Council by the 31st May of each year. This report shall identify the herbicide spraying that has taken place in the previous twelve months including:
- (i) the areas of operation;
 - (ii) the type of chemicals used in each area including herbicides and surfactants;
 - (iii) the spray method used;
 - (iv) the dates of operations;
 - (v) location of water quality monitoring sites, and
 - (vi) the results and an analysis of any monitoring of the operation that has taken place.

19. Samples of water shall be taken from at least five areas each year in the vicinity of which herbicide spraying has been undertaken over an area of at least 0.5 hectares. Samples shall be taken from at least two areas where triclopyr has been discharged and at least two areas where glyphosate has been discharged. Sampling, analysis and reporting shall be undertaken in accordance with conditions 20 and 21.
20. In areas where triclopyr has been discharged –
 - (a) Samples of water shall be taken from channels containing flowing water within 25 metres downstream and immediately upstream of the spray area. Samples shall be taken as follows:
 - (i) One upstream sample shall be taken immediately prior to spraying;
 - (ii) One downstream sample shall be taken upon the conclusion of spraying; and
 - (iii) One downstream sample shall be taken within 40 days of the conclusion of spraying and following sufficient rainfall or river flow to result in surface water movement over the sprayed area.
 - (b) The samples taken in accordance with (a)(ii) and (iii) shall be analysed for triclopyr.
 - (c) The sample taken in accordance with Condition (a)(i) shall be analysed for triclopyr only if the samples taken in accordance with either (a)(ii) or (iii) show a result that is greater than or equal to the maximum concentration specified in Condition 7(ii).
 - (d) If the analysis of the samples taken in accordance with Condition (a)(ii) or (iii) shows that the concentration of triclopyr **does not exceed** the concentration specified in Condition 7(ii), the results shall be provided to the Canterbury Regional Council within ten working days of receipt of the results by the consent holder.
 - (e) If the analysis of the sample taken in accordance with 20(a)(i) or 20(a)(ii) shows that the concentration of triclopyr determined

exceeds the concentration specified in Condition 7(ii), the consent holder shall:

- (i) Notify the Compliance Monitoring Section of Canterbury Regional Council within two working days of receipt of the results by the consent holder; and
- (ii) Implement all practicable measures to reduce the concentration of the contaminant in the receiving environment. Without limitation such measures may include cessation of activities that may have caused the exceeding concentration, or removal of contaminant source(s), or review of discharge procedures. The measures to be implemented shall be reported to the Compliance Monitoring Section of Canterbury Regional Council along with the notice of the results under (e)(i).

21. In areas where glyphosate has been discharged –

- (a) Samples of water shall be taken from channels containing flowing water within 25 metres downstream and immediately upstream of the spray area. Samples shall be taken as follows:
 - (i) One upstream sample shall be taken immediately prior to spraying,
 - (ii) One downstream sample shall be taken upon the conclusion of spraying.
- (b) The samples taken in accordance with (a)(ii) shall be analysed for glyphosate.
- (c) The sample taken in accordance with Condition (a)(i) shall only be analysed for glyphosate if the sample taken in accordance with Condition (a)(ii) shows a result that is greater than or equal to the maximum concentration specified in Condition 7(i).
- (d) If the analysis of the samples taken in accordance with Condition (a)(ii) shows that the concentration of glyphosate **does not exceed** the concentration specified in Condition 7(i), the results shall be provided to

the Canterbury Regional Council within ten working days of receipt of the results by the consent holder.

- (e) If the analysis of the sample taken in accordance with (a)(i) or (ii) shows that the concentration of glyphosate determined **exceeds** the concentration specified in Condition 7(i), the consent holder shall:
 - (i) Notify the Compliance Monitoring Section of Canterbury Regional Council within two working days of receipt of the results by the consent holder; and
 - (ii) Implement all practicable measures to reduce the concentration of the contaminant in the receiving environment. Such measures may include cessation of activities that may have caused the exceeding concentration, or removal of contaminant source(s), or review of discharge procedures. The measures to be implemented shall be reported to the Compliance Monitoring Section of Canterbury Regional Council along with the notice of the results under (e)(i).
22. (a) Where the permission of the Waimakariri District Council has been obtained a representative sample of groundwater shall be taken from a Waimakariri District Council public supply bore between 24 and 72 hours of herbicides being sprayed on an area within 250 metres up-gradient of the bore and shall be analysed for glyphosate and triclopyr.
- (b) The results of these analyses shall be provided to the Compliance Monitoring Section of the Canterbury Regional Council and the Waimakariri District Council within twenty working days of sampling taking place.
 - (c) If the analysis of any sample taken in accordance with (a) shows that the concentration of herbicide determined exceeds the concentration given in Condition 7(i) or (ii), the consent holder shall obtain and analyse a second sample of groundwater from another bore in accordance with (a).

23. All water sample analyses shall be undertaken by a laboratory accredited to NZS/ISO/IEC Guide 17025 or equivalent defined by an accreditation body recognised as operating to ISO/IEC Guide 58 for those analyses.
24. The Canterbury Regional Council may, on any working day in November or February, serve notice of its intention to review the conditions of this consent for the purposes of:
 - (a) Determining whether the conditions of this consent are adequate to deal with any adverse effects on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage; or
 - (b) Altering the frequency or type of monitoring required under this consent.
 - (c) Complying with the requirements of a relevant rule in an operative regional plan.

APPENDIX 2

CRC041535 CONSENT CONDITIONS

- 1) (a) All persons undertaking activity authorised by this consent shall be familiar with the provisions of the “Environment Canterbury Handbook for Spraying”, current at the time each discharge event occurs, including:
 - i) Quality Control Plan for the Discharge of Herbicides to Control Fairway Vegetation and Vegetation Control in Water Courses and Enclosed Freshwater Bodies; and
 - ii) Safety Procedures and Contingency Plan.
 - iii) Hot Spots list and spawning times.
- (b) Updated copies of the “Environment Canterbury Handbook for Spraying” shall be provided to the Canterbury Regional Council

for the attention of the Compliance Monitoring Section by 1 August each year.

- 2)
 - (a) The only herbicides discharged to a waterway shall be glyphosate, triclopyr or diquat. For the purposes of this consent, a waterway is defined as any drain, water race, irrigation channel, canal, stream or river in the Canterbury Region, where a discharge to the waterway is not authorised by resource consent CRC981580.
 - (b) Diquat shall only be discharged to waterways as follows:
 - (i) where the use of glyphosate has failed to control emergent or submerged broadleaf weeds; or
 - (ii) to control weeds in the Ashburton Hinds Drainage Scheme.
 - (c) **Triclopyr shall not be discharged directly to water** and shall not be discharged to any waterway containing, **or that may contain, water.**
 - (d) The only herbicides discharged to any enclosed freshwater body shall be glyphosate or diquat.
 - (e) Additives to these herbicides shall only be surfactants or marker dyes added in accordance with the manufacturer's instructions.
- 3)
 - (a) The method of discharge for glyphosate, triclopyr and added surfactants shall be ground-based spraying, which includes hand-held spot application using backpack sprayers, fine droplet hand held sprayers and mist blowers, and vehicle mounted guns and booms.
 - (b) **Diquat shall only be used as a proprietary gel formulation.**
- 4)
 - (a) Herbicide shall be discharged in a manner which complies with the "Agrichemical User's Code of Practice and Appendices", NZMS 8409:1999, or any subsequent versions of that document current at the time of discharge.
 - (b) The person carrying out the discharge shall hold a current certificate as a registered herbicide applicator issued by a

nationally-recognised herbicide applicator training organisation.

- 5) The application rate and concentration of any herbicides and surfactants discharged shall not exceed the manufacturer's recommended rate for the product and purpose of use.
- 6) Only herbicides that are registered at the time of discharge for the purpose of vegetation control under the Hazardous Substances and New Organisms Act 1996, the Agricultural Compounds and Veterinary Medicines Act 1997, or any succeeding legislation shall be discharged.
- 7) There shall be no discharge on public holidays, or weekends which immediately precede or follow public holidays.
- 8) (a) The consent holder shall prepare a Proposed Plan for Herbicide Application (the Proposed Plan) at least once per year. The Proposed Plan shall identify the herbicide application areas for the coming year, proposed dates of application, herbicides to be used and method(s) of application. The Proposed Plan shall be forwarded to the following parties by 1 August of each year:
 - (i) The Canterbury Regional Council for the attention of the Compliance Monitoring Section
 - (ii) the territorial authorities within whose districts the discharge will occur;
 - (iii) Te Rūnanga O Ngāi Tahu;
 - (iv) the Rūnanga within whose rohé herbicide discharges will occur;
 - (v) the Councils of Fish and Game New Zealand within whose regions the discharge will occur;
 - (vi) The Department of Conservation area conservancies within which the discharge will occur; and
 - (vii) National Beekeepers Association – Canterbury Branch

These parties shall be invited to provide comments on the Proposed Plan within 15 working days.

- (b) The consent holder shall convene a meeting to be held during September each year to which the parties listed are invited to discuss; the Proposed Plan and issues and identify areas of concern; spraying practices; monitoring results; current and predicted herbicide use; contractor performance and training needs; and the effectiveness of the consent conditions.
 - (c) The consent holder shall take into account matters identified in comments on the Proposed Plan made by these parties, or matters raised during the meeting, and amend the Proposed Plan accordingly.
 - (d) Consultation with the Te Rūnanga O Ngāi Tahu, the Department of Conservation, and Fish and Game New Zealand shall occur prior to any discharge during fish spawning times into a fish spawning area located in a waterbody identified in the "Hot Spots" list, as defined in the "Environment Canterbury Handbook for Spraying".
- 9) There shall be no discharge onto native bank-side vegetation, as far as practicable.
- 10) The discharge shall not occur within:
- (a) 25 metres upstream of an intake for a water supply that is not used for domestic or community water supply purposes; or
 - (b) 250 metres upstream of an intake for a water supply that is used for domestic or private water supply purposes; or
 - (c) 1 kilometre upstream of an intake for a water supply that is used for community water supply purposes; unless the owner of the water supply has given written permission to the discharge occurring closer to the intake than the distances above.

- 11) All mixing of chemicals used for the discharge shall be **sufficiently remote from any watercourse** so that any accidental spillage of chemicals or spray does not discharge to the watercourse.
- 12) A copy of this resource consent shall be given to all persons undertaking activities authorised by this consent prior to commencing the activities.
- 13) The concentration of glyphosate in the waters of any watercourse arising from the exercise of this consent shall not, after reasonable mixing, exceed 0.1 grams per cubic metre. Reasonable mixing is deemed to have occurred 25 metres downstream of a discharge in a watercourse, or 25 metres from a discharge into a lake.
- 14) The concentration of triclopyr in the waters of any watercourse arising from the exercise of this consent shall not, after reasonable mixing, exceed 0.01 grams per cubic metre. Reasonable mixing is deemed to have occurred 25 metres downstream of a discharge.
- 15) The concentration of diquat in the waters of any watercourse arising from the exercise of this consent shall not exceed, after reasonable mixing, 0.01 grams per cubic metre. Reasonable mixing is deemed to have occurred 25 metres downstream of a discharge in a watercourse, or 25 metres from a discharge into a lake.
- 16)
 - (a) The percentage saturation of dissolved oxygen in the waters of any watercourse arising from the exercise of this consent shall not fall below 70 percent.
 - (b) Where it is intended to kill a significant proportion of the emergent aquatic plants in a section of a waterbody as a result of the discharge; and
 - (i) this is likely to reduce the dissolved oxygen concentration to less than 80 percent saturation; or
 - (ii) the section of the waterbody has significant ecological values;

spray applications shall be staggered to ensure that no more than 50 percent of the length or area of the margins of the section of the waterbody is sprayed at any one time, and there shall be at least a 30-day interval before spray application recommences to the balance area of that section of the waterbody.

- 17) There shall be no discharge of contaminants within **50** metres of any **beehive**.
- 18) There shall be no discharge of surfactant onto plants in flower where honey bees are likely to be present if it has been demonstrated in field or laboratory tests and reported in published material that the surfactant is toxic to honey bees when discharged in accordance with manufacturer's instructions.
- 19) The discharge shall not occur within **50** metres of any **bird nesting** or rearing young on the bed or bank of a river.
- 20) The discharge shall not cause an objectionable or offensive **odour** beyond **100** metres from the point of discharge.
- 21) Samples containing a mix of herbicides and water that is to be discharged shall be taken during at least six discharge events each year to ensure manufacturer's specifications are not being exceeded.
- 22) Samples of the receiving water shall be taken from at least six areas each year in the vicinity of which herbicide discharge has been undertaken over an area of at least 0.5 hectares. Samples shall be taken from at least two areas where triclopyr has been discharged, at least two areas where glyphosate has been discharged, and at least two areas where diquat has been discharged. Sampling, analysis and reporting shall be undertaken in accordance with conditions (23) to (28) below.
- 23) In areas where triclopyr has been discharged -

- (a) Samples of water shall be taken from channels containing flowing water within 25 metres downstream and immediately upstream of the spray area. Samples shall be taken as follows:
 - (i) One upstream sample shall be taken immediately prior to spraying;
 - (ii) One downstream sample shall be taken immediately after spraying; and
 - (iii) One downstream sample shall be taken within 40 days of the conclusion of spraying and following sufficient rainfall on river flow to result in surface water movement over the sprayed area.
 - (b) The samples taken in accordance with (a) shall be analysed for triclopyr.
- 24) In areas where glyphosate has been discharged -
- (a) Samples of water shall be taken from channels containing flowing water within 25 metres downstream and immediately upstream of the spray area. Samples shall be taken as follows:
 - (i) One upstream sample shall be taken immediately prior to spraying,
 - (ii) One downstream sample shall be taken immediately after spraying.
 - (iii) One downstream sample shall be taken after 12 hours but within 72 hours of the conclusion of spraying.
 - (b) The samples taken in accordance with (a) shall be analysed for glyphosate.
- 25) In areas where diquat has been discharged –
- (a) Samples of water shall be taken from channels containing flowing water within 25 metres downstream and immediately upstream of the diquat application area. Samples shall be taken as follows:
 - (i) One upstream sample shall be taken immediately prior to diquat gel being applied,

- (ii) One downstream sample shall be taken immediately after diquat gel application is complete.
 - (iii) One downstream sample shall be taken after 12 hours but within 72 hours of the completion of the diquat gel application.
 - (b) The samples taken in accordance with (a) shall be analysed for diquat.
- 26) All water sample analyses carried out in accordance with Conditions (23)(b), (24)(b) and (25)(b) shall be undertaken by a laboratory accredited to NZS/ISO/IEC Guide 17025 or equivalent defined by an accreditation body recognised as operating to ISO/IEC Guide 58 for those analyses.
- 27) If the analysis of any sample taken shows that the concentration of herbicide determined does not exceed the levels given in conditions (13), (14), or (15) the results shall be provided to the Canterbury Regional Council for the attention of the Compliance Monitoring Section ten working days of receipt of the results by the consent holder.
- 28) If the analysis of any sample taken shows that the concentration of herbicide determined exceeds the levels given in Condition (13), (14), or (15), the consent holder shall:
 - (a) Notify any known public, private or community water supply downstream of the sample area immediately the result is known;
 - (b) Notify the Canterbury Regional Council for the attention of the Compliance Monitoring Section immediately the result is known; and
 - (c) Implement all practicable measures to reduce the concentration of the contaminant in the receiving environment. Such measures may include cessation of activities that may have caused the excessive concentrations or removal of contaminant source(s).

- (d) Implement all practicable measures to prevent a recurrence of the event in any location.
 - (e) Following the implementation of any measures undertaken in compliance with (c) the consent holder shall obtain and analyse a second set of samples within the next 48 hours. Results of this analysis shall be reported to the Canterbury Regional Council for the attention of the Compliance Monitoring Section immediately the results are known.
- 29)
- (a) Within three months from the date of granting of this consent, the consent holder shall in consultation with Te Rūnanga O Ngāi Tahu and with the advice of a Fisheries expert agreed on by between itself and Te Rūnanga O Ngāi Tahu draw up a programme of on-going monitoring to be undertaken to indicate any effects of the discharge on eels in the waterways in the Ashburton Hinds Drainage Scheme. This programme will include provisions for the reporting of results to Te Rūnanga O Ngāi Tahu.
 - (b) Within two weeks of it being drawn up, a copy of the monitoring programme shall be forwarded to the Canterbury Regional Council for the attention of the Compliance Monitoring Section.
 - (c) The monitoring programme prepared under (a) shall be implemented and carried out by the consent holder over a period of ten years commencing no later than six months after the granting of this consent.
- 30)
- (a) Within three months from the date of granting of this consent, the consent holder shall in consultation with Te Rūnanga O Ngāi Tahu, the Department of Conservation, Fish and Game New Zealand and Water Quality Scientists from the Canterbury Regional Council, draw up a monitoring programme to be undertaken within an area where it is anticipated regular discharge of herbicides will occur to indicate any effects of the discharge on invertebrates. This programme will include provisions for the reporting of results to Te Rūnanga O Ngāi Tahu.

- (b) Within two weeks of it being drawn up, a copy of the monitoring programme shall be forwarded to the Canterbury Regional Council for the attention of the Compliance Monitoring Section.
 - (c) The monitoring programme prepared under (a) shall be implemented and carried out by the consent holder over a period of ten years commencing no later than six months after the granting of this consent.

- 31) The consent holder shall provide to the Canterbury Regional Council Compliance Monitoring Section, by the last working day of each month, a programme of the herbicide discharge activity that will be undertaken in the following month. This programme shall provide details of the location of operations, target vegetation, herbicides to be used and methods of application.

- 32) Should any **excessive application of herbicide or a herbicide spill event occur into a waterway** or enclosed freshwater body from which a drinking water supply (private or community) is being drawn, then the consent holder shall notify the **owners or operators of these supplies immediately**.

- 33) When spraying the consent holder shall erect and maintain signs where people normally obtain access to the spray area. The notices shall be capable of being read from a distance of five metres and shall be maintained for the duration of the spraying. The notices shall note:
 - a) that spraying is in progress;
 - b) the proposed times of the spraying;
 - c) method of application; and
 - d) the active chemical being used.

- 34) The consent holder shall provide a report to the Canterbury Regional Council for the attention of the Compliance Monitoring Section by the 31st May of each year. This report shall identify the vegetation spraying that has taken place in the previous twelve months including:
 - a) the areas of operation;

- b) the type of chemicals used;
 - c) the amount of chemical used;
 - d) spray method used;
 - e) the dates of the operation; and
 - f) the results, and an analysis of the results of any monitoring that has taken place.
- 35) The applicant will annually review its current practises regarding herbicide use and need for herbicide use and alternative herbicide compounds that could be used. This will take into account current information regarding alternatives to spraying, and a commitment to decreasing herbicide use over the duration of the consent. These will be incorporated into the documents identified in condition (1) of this consent and any changes notified to the parties listed in condition (8) of this consent.
- 36) The Canterbury Regional Council may, on any of the last five working days of November or February, each year serve notice of its intention to review the conditions of this consent for the purposes of:
- (a) Determining whether the conditions of this consent are adequate to deal with any adverse effects on the environment, which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
 - (b) Altering the frequency and type of monitoring required under this consent; or
 - (c) Requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment.
- 37) The lapsing date for the purposes of section 125 shall be 30 September 2009.

APPENDIX 3

QUALITY CONTROL PLAN FOR THE DISCHARGE OF HERBICIDES

1. The application rate and concentration of any herbicides and surfactants discharged must be in accordance with the manufacturers recommended rate for the product and purpose of use (refer to the Novachem manual for recommended rates)
2. Aerial spraying shall only be used in areas where the spray cannot enter water or where access is difficult and the target plant is extensive.
3. The only target vegetation in river beds and stream shall be exotic trees and woody or herbaceous weed species. Drain or small watercourse spraying will target emergent or submergent weed species such as monkey musk and water twitch. All spray operations will avoid spraying native vegetation.
4. Where the target vegetation is on land all practicable measures shall be undertaken to prevent the application of herbicides or surfactants directly onto or over surface waters. In particular spraying shall be directed away from open water
5. Aerial spray operators (chief pilots) shall hold a commercial pilot's license, and a Grade 1 agricultural rating. In addition, the aerial work company must have an Agricultural Aircraft Operator's Certificate.
6. Herbicide shall only be discharged by applicators who hold the relevant Certified Handlers Certificates (where required by the Environmental Protection Agency regulations)
7. All mixing of spray chemicals and cleaning of spray equipment shall be undertaken in an area sufficiently remote from any surface waterbody to ensure that spillage does not discharge into any surface waterbody.

8. A spill kit must be kept on site at all times during spraying operations, and staff must be trained in the use of the kit and in managing spills.
9. The operator shall ensure that the filling of tanks when diluting concentrated herbicides shall be carried out in a manner that prevents back-flow. The filling procedures and back flow prevention devices and methods should fully comply with the Water Supplies Protection Regulations 1961.
10. The operator shall ensure that all spraying equipment is operated and maintained to a standard that allows compliance with conditions of this consent.
- 9 (a) An acceptable protocol for accessing wind speed, (at the commencement and during the day's operation) shall be used.
(b) Spraying shall not occur whenever wind speeds are greater than 10 kilometres per hour.
(c) There shall be no spraying when wind conditions are such that spray drift onto non-target areas is likely to occur.
- 10 All spraying shall be carried out using a method and equipment that minimises the risk for spray drift beyond the target area to cause a hazard and which ensures public safety at all times.
- 11 (a) No spraying shall be carried out when vegetation is wet from rain or when rain is forecast to fall in the area being sprayed within:
 - 2 hours for glyphosate with surfactant
 - 6 hours for glyphosate without surfactant
 - 1 hour for triclopyr with surfactant
 - 3 hours for triclopyr without surfactant.(b) Other specific times shall be avoided on an as required basis, after the notification procedures outlined have been followed.
12. In the event of any spray drift incident beyond the target area, the operator shall immediately notify all potentially affected parties. These at minimum shall include affected landowners, the relevant territorial

authority, Environment Canterbury, the Medical Officer of Health, the relevant local Rūnanga within whose takiwā the incident occurred when areas for mahinga kai are in the area, and the MAF Regulatory Authority (Enforcement Unit).

13. All schools located within 250 metres of any land to be sprayed via aerial application will be notified of the intention to spray, at least five days prior to spraying.
14. There must be no spraying within 50m of any beehive or within 50m of any bird nesting activity.
15. The personnel carrying out the spraying shall complete the work in progress logbook daily during the spraying operation/programme. This shall include the location of the water sources used for diluting the approved herbicide solutions and for cleaning spray equipment.
15. When spraying the consent holder shall erect and maintain signs where people normally obtain access to the spray area. The notices shall note that spraying is in progress, state the proposed dates(s) of the spraying, state if it is aerial or ground based and state the active chemical being used. The notices shall be capable of being read from a distance of five metres and shall be maintained for the duration of the spraying.

APPENDIX 4

ENVIRONMENT CANTERBURY HERBICIDE SPRAYING OPERATIONS SAFETY PROCEDURES AND CONTINGENCY PLAN

INTRODUCTION

Environment Canterbury and its agent(s) will take every reasonable precaution to minimize risk to people, livestock, the environment and property during spraying operations.

There are two main areas of risk associated with operations. The first is on-site activities associated with transporting, handling, loading of equipment and the application of the herbicide. The second is off-site activities associated with vehicles and accidental spillage of herbicide outside the target areas.

Staff responsibilities for following the safety procedures and contingency plan in emergency situations are set out below. The Agrichemical Users Code of Practice, and materials data sheets form the basis of the safety procedures and contingency plan.

ON-SITE SAFETY PROCEDURES

The management of safety on-site at all field operations shall be the responsibility of the Council's Overseer or Contractor in Charge engaged to carry out the work. In all cases, work shall be carried out in accordance with the Agrichemical Users Code of Practice and the specifications for control of fairway vegetation by spraying.

OFF-SITE SAFETY PROCEDURES

Off-site safety procedures apply to accidental overfly and emergencies associated with herbicide application.

The loss of, or dispersal of, herbicide in any area other than the defined target area is termed an accidental overfly.

An emergency is any activity which does not conform to the agreed spraying procedures and/or the operational plan or is in conflict with it, or may cause unintended risk or damage to people or property.

The Council Overseer or Contractor in Charge of the herbicide application operation on site shall be the person responsible for initiating any contingency plans and ensuring that they are carried out correctly.

As soon as anyone involved with the operation becomes aware of an accident or emergency, they must immediately inform the Overseer or Contractor in Charge.

The Overseer or Contractor in Charge must immediately assess the situation and with reference to the appropriate manufacturer's materials data sheet take any urgent action that is necessary to prevent risk to humans, losses of livestock, damage to the environment or damages to property. In the case of humans, basic first aid must be applied.

If required, the appropriate official emergency services must be alerted and/or summoned immediately.

If stock are at risk, the owner should be contacted directly to take appropriate measures. If the Overseer or Contractor in Charge cannot make immediate contact, staff must act promptly to prevent stock losses by moving them away from affected areas.

Everything possible must be done to contain spillage and prevent any herbicide from entering waterways, ponds, lakes, drainage systems or the sea.

As soon as an accidental overfly/emergency has been assessed by the Overseer or Contractor in Charge and initial actions (defined above) have

been taken, he must then inform the Asset Manager and brief him/her on the situation. Failing this he must contact the Regional Engineer.

The Asset Manager or the Regional Engineer will take the Overseer's or Contractor in Charge's report and decide what other action or additional measures must be taken.

The Asset Manager or Regional Engineer shall be responsible for notifying Environment Canterbury's Consents Manager of any accident or emergency and for notifying the Medical Officer of Health, regarding matters of poisoning of livestock and domestic animals or the possible contamination of potable water

APPENDIX 5 HOT SPOTS LIST

Note this is an excerpt from the full HotSpots list as a number of the sites on the full list are not sprayed by the Rivers Section.

Site	Locality	Species present	Migration and Spawning season for species present
<i>Ashburton River</i>	<i>MC</i>	<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
		<i>Longfin eel</i>	<i>M: Jul-Nov sea to FW and March-May FW to sea</i>
<i>Ashley River</i>	<i>NC</i>	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
		<i>Canterbury Mudfish (at Tutaapatu Lagoon)</i>	<i>S: July-Sept M: N/A</i>
		<i>Longfin Eel</i>	<i>M: Jul-Nov sea to FW and March-May FW to sea</i>
<i>Cam River</i>	<i>WMKI</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
		<i>Giant Kokopu</i>	<i>S: Jul– September M: N/A</i>
<i>Carters Creek</i>	<i>MC</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
<i>Coopers Creek</i>	<i>SC</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
<i>Cust River</i>	<i>WMKI</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
<i>Flemmington Drain</i>	<i>MC</i>	<i>Brown Trout, Rainbow Trout</i>	<i>S: BT Mid May to Mid Sept, RT July to Nov</i>
		<i>Salmon</i>	<i>S: April-Sept</i>
<i>Greys River and Tribs</i>	<i>SC</i>	<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
<i>Hinds River NB</i>	<i>MC</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
<i>Hook River</i>	<i>SC</i>	<i>Brown Trout, Rainbow Trout</i>	<i>S: BT Mid May to Mid Sept, RT July to Nov</i>
		<i>Salmon</i>	<i>S: April-Sept</i>
<i>Kaiapoi River opposite boat ramp</i>	<i>WMKI</i>	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Morven Drain @ Makikihi</i>	<i>SC</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>

<i>Opihi River</i>	SC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
		<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
		<i>Canterbury mudfish around Rangatira Creek</i>	<i>S: July-Sept M: N/A</i>
		<i>Longfin eel</i>	<i>M: Jul-Nov sea to FW and March-May FW to sea</i>
<i>Orari River @ Ohapi Ck Conf</i>	SC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>O'Shaughnesseys Drain</i>	MC	<i>Brown Trout, Rainbow Trout</i>	<i>S: BT Mid May to Mid Sept, RT July to Nov</i>
		<i>Salmon</i>	<i>S: April-Sept</i>
<i>Ohau River and Fraser Stream</i>	SC	<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
<i>Okuti River</i>	MC	<i>Lamprey</i>	<i>S: Oct-Nov M: Sea to FW April-Aug, FW to Sea Jul-Aug</i>
<i>Otipua Creek</i>	SC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Otuikaikino Creek</i>	WMKI	<i>Non-Migratory galaxiids</i>	<i>S: May – September M: N/A</i>
		<i>Salmon</i>	
		<i>Lamprey</i>	<i>S: Oct-Nov M: Sea to FW April-Aug, FW to Sea Jul-Aug</i>
<i>Parakanoi Drain</i>	MC	<i>Brown Trout, Rainbow Trout</i>	<i>S: BT Mid May to Mid Sept, RT July to Nov</i>
		<i>Salmon</i>	<i>S: April-Sept</i>
<i>Pareora River</i>	SC	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
<i>Pareora River Lagoon</i>	SC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Rakaia River</i>	MC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Rangitata River</i>	SC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
		<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
<i>Saltwater Creek</i>	NC	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Seadown Drain</i>	SC	<i>Brown Trout, Rainbow Trout</i>	<i>S: BT Mid May to Mid Sept, RT July to Nov</i>

		<i>Salmon</i>	<i>S: April-Sept</i>
<i>Selwyn River</i>	<i>MC</i>	<i>Canterbury Mudfish</i>	<i>S: July-Sept M: N/A</i>
<i>Taranaki Creek @ Box Bank</i>	<i>NC</i>	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Tengawai River</i>	<i>SC</i>	<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
		<i>Longfin eel</i>	<i>M: Jul-Nov sea to FW and March-May FW to sea</i>
		<i>Lamprey</i>	<i>S: Oct-Nov M: Sea to FW April-Aug, FW to Sea Jul-Aug</i>
		<i>Freshwater mussels and koura</i>	<i>Year round</i>
<i>Waihao River</i>	<i>SC</i>	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
		<i>Canterbury mudfish</i>	<i>S: July-Sept M: N/A</i>
		<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
		<i>Lamprey</i>	<i>S: Oct-Nov M: Sea to FW April-Aug, FW to Sea Jul-Aug</i>
<i>Waimakariri River (Tidal area)</i>	<i>WMKI</i>	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
<i>Waitaki River (upper catchment wetlands, mainstem and Welcome Creek area)</i>	<i>SC</i>	<i>Inanga</i>	<i>S: Jan-June M: Aug-Nov</i>
		<i>Canterbury mudfish</i>	<i>S: July-Sept M: N/A</i>
		<i>Non-migratory galaxiids</i>	<i>S: May – September M: N/A</i>
<i>Washdyke Creek</i>	<i>SC</i>	<i>Banded Kokopu</i>	<i>S: May – September M: N/A</i>
		<i>Kōaro</i>	<i>S: May – September M: N/A</i>
		<i>īnanga</i>	<i>S: Jan-June M: Aug-Nov</i>
		<i>Canterbury mudfish (especially Papaka Stream)</i>	<i>S: July-Sept M: N/A</i>
<i>Windermere Drain</i>	<i>MC</i>	<i>Brown Trout, Rainbow Trout</i>	<i>S: BT Mid May to Mid Sept, RT July to Nov</i>
		<i>Salmon</i>	<i>S: April-Sept</i>

APPENDIX 6

Spill Response Plan

For the Rivers Section under the Defences Against Water Code of Practice

PURPOSE:

To manage and contain accidental spills of fuel, transmission fluid, oils, agrichemicals or any other hazardous substances anywhere in Canterbury.

This plan outlines how to safely identify and contain hazardous substances spills, procedures for cleaning up and disposing of contaminated material and reporting of spills in accordance with the Defences Against Water Code of Practice.

This response plan does not apply to inside the chemical stores at the depots as these have spill procedures specific to the site. A spill report should still be completed for spills at the chemical store.

PROCEDURE:

Assess the risk

- Know the chemical/substances that you are using – use inventory sheets to keep track of stock, and make sure all containers are clearly labelled.
- Make sure you have up to date Material Safety Data Sheets (MSDS) available to you at all times.
- Identify the areas that could be affected by a spill – both the immediately surrounding area and downstream should a spill enter a waterway.

Reduce the risk

Agrichemicals

- Where possible, store chemicals and mix chemicals on site in a position where they are unable to enter water if they are spilled, and must be at least 20 metres away from any surface water body, well or community drinking supply protection zone.

- Follow the manufactures instructions for safe handling and mixing of agrichemicals, and follow the guidelines in the Rivers Section Handbook for Spraying (2021) for preparation for spraying.
- Do not tip spray container rinsing's onto the ground or into any drainage network. Rinsing's must be tipped back into the main spray tank.

Fuels and oils

- Refuelling of mobile plant should be done outside of the river bed on an impermeable base, however if this is not possible a drip try must be used.
- For non-mobile plant, refuelling must be done with a drip try or other spill-containment installed.
- Conduct regular maintenance checks on all vehicles and machinery to minimise the chances of fuel or oil leaks or hose blow outs.
- Have a spill kit available on site, which can be used to contain and clean up spills of chemicals, fuels and other hazardous substances.
 - A spill kit contains equipment used to clean up a spill such as a shovel, broom, drain covers, sandbags, booms and absorbent material. All spills need to be handled with compatible materials.
 - The kit should also contain equipment for storing and disposing of spilled material such as safe containers, bags, and drums.

Response plan for hazardous substances spills.

This spill response plan must be given and explained to all staff. It is important to have regular training and practice runs on spill response to ensure that you know what you are doing should a real spill occur.

Step 1: Health and Safety

Yours and your work colleague's safety is the number one priority during a spill response. Do not attempt to clean up a spill of hazardous material if you do not have the correct personal protective equipment on. PPE that must be used includes items such as gloves, protective clothing, appropriate footwear, respirators and eye protection.

Step 2: Identify the substance spilt

Determine what the spilt substance is – fuel, oil, agrichemical etc. This then determines how the spill is dealt with as different substances react differently. Consult the MSDS sheet for the substance for guidance.

Step 3: Stop the spill

If safe to do so, stop any further material from leaking – for example rolling chemical drums around so that the hole is at the top, turn off the tap or valve, plug the leak.

Step 4: Contain the spilt material

Aim to control the spread of the spill as quickly as possible to minimise the affected area. Ensure that it is safe to undertake the following actions before doing so. Also ensure that people are not walking through the spill and spreading it on their footwear.

Agrichemical

If the chemical has been spilled on the ground and is in a granulated form, cover the spill with plastic to stop it blowing around with the wind. The spill and any contaminated ground must be scooped up and placed in a disposal container and disposed of at the appropriate facility. If the granules have been spilt into a water body, if possible attempt to scoop out the granules before they can become fully diluted.

If the chemical is in a liquid form, there is little that can be done to contain chemical spill into the waterway. Minimise the effect of the spill by stopping the material getting into the water as quickly as possible. If the liquid chemical has been spilt onto the ground, the material and any contaminated ground must be scooped up and placed in a suitable container and disposed of at an appropriate facility.

Hydrocarbons (fuel, oil)

Substances such as diesel and oil will float on top of the water surface, to prevent the spread of the spill downstream in a water body an absorbent boom should be used to contain the spill and absorbent pads can be used to mop up the spill. If the oil or fuel has been spilt on the ground, the ground

(dirt, gravels, sand, and any vegetation) must be scooped up and placed in a suitable container and disposed of at the appropriate facility.

Step 5: dispose of contaminated material

All spilled material and any contaminated material associated with the clean up of the spill must be disposed of at the appropriate facility, in most instances this will need to be at landfill.

Step 6: record and report details of the incident

Please use the Hazardous Substance spill record sheet (Attachment 1) to record the details of the incident.

Incidents of hazardous substance spillages into water bodies must be reported to the Incident Response Hotline at 0800 76 55 88 or ecinfo@ecan.govt.nz. The Incident Response team are trained in the clean up of hazardous substances spills, so are a useful resource for guidance on how to manage a spill.

Step 7: Restock your spill kit

Make sure any equipment used during the clean up of a spill is restocked in the spill kit.

Step 8: Review

Review the incident, and see how the incident could be avoided in future and make sure the findings of the review are implemented. This should also be recorded on the Hazardous Substances spill record sheet.

Contact details:

For a serious spill, contact the **Fire Service 111** and the **Incident Response Hotline 0800 76 55 88**

Call the office – Melissa 0275629969 or Leigh 0275497715

APPENDIX 7 EMERGENCY TELEPHONE NUMBERS

Environment Canterbury	
Manager Rivers	027 549 7715
Environmental Advisor	0275629969
Incident Response Hotline	03 366 4663 or 0800 76 55 88
District Councils	
Kaikoura	03 319 5026
Hurunui	03 314 8816
Waimakariri	03 3118900
Christchurch	03 941 8999
Selwyn	03 347 2800
Ashburton	03 307 7700
Waimate	03 689 8079
Timaru	03 687 7200
MacKenzie	03 685 0910
Waitaki	03 433 0300
Medical Officer of Health for Canterbury	
Christchurch and Timaru	03 364 1777
Rūnanga	
Kaikoura	03 3196523
Tuarhuriri	03 3135543
Taumutu	03 3712660
Arowhenua	03 6159646
Waiaho	03 6894726
Moreaki	03 439 4816
Koukourarata	03 365 3281
Onuku	03 381 2082
Wairewa	03 377 1513
Rapaki	03 328 9415
MPI	
MPI	0800 008333 or 04 894 0100
Department of Conservation	
Mahaanui	03 341 9100
Aoraki	03 435 1819
Raukapuka	03 693 1010
Twizel	03 435 0802
Waimakariri	03 313 0820
South Marlborough	03 572 9100
DOC Hotline	0800 362 468