



Biodiversity Offset Area –

Land Management Action Plan 2018-19

Orica Mining Services – Kurri Kurri NSW – August 2018

This Land Management Action Plan was produced for Orica Mining Services in August 2018 to outline the management work during 2017/2018 and ongoing requirements for the Kurri Kurri site Biodiversity Offset area for 2018-19.

SUBMITTED	DATE	REVISION
Ryan Bremmell	21/08/2018	Draft 1
Ryan Bremmell	24/08/2018	Final

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24/08/2018
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Daniel Lewer (Senior Consultant– Managing Director) – HUNTER LAND MANAGEMENT PTY LTD

Cover Photo: Fox visiting a bait station in Autumn 2018 1080 Baiting Program



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Introduction

For the past 6 years Hunter Land Management (HLM) carried out weed and pest control at the Orica Biodiversity Offset Area (BOA) at Kurri Kurri NSW (see Figure 1). This includes both primary and secondary treatment of the targeted weeds as identified in the Biodiversity Offset Area Vegetation Management Plan (Umwelt 2012) and 1080 Wild Dog and Fox Baiting in 2017/2018. The most recent weed control was conducted under the 2017-18 Weed Action Plan which was developed in July 2014. The creation of the 2013-14, 2014-15, 2016-2017, 2017-2018 and 2018-2019 Land Management Action Plan (LMAP) is an evolution of this plan of management. This LMAP identifies further issues which are not only impacting on the ability to control weeds at the site but broader land management issues which are impacting on the overall health of the BOA.

Hunter Land Management undertook the following methodology to develop this Land Management Action Plan in 2018-19 for Orica Mining Services Biodiversity Offset area at Kurri Kurri NSW to observe and record noxious and environmental weeds, erosion, waste, fence condition and any vertebrate pest signs in the area. Other land management issues affecting the health of the biodiversity area were also noted.

1. Land Management Actions 2017-18

The two main land management actions which were undertaken on site during 2017/2018 including weed and pest control. A weed control campaign was undertaken in the high priority area during May 2018 along with a vertebrate pest control (1080 baiting) program was undertaken in May/June 2018. Details of these programs can be found below.

1.1 Weeds

Weed control at the site has been effective over the 2012-18 control period with a large reduction in density and species present. Primary control has seen a major reduction in large volumes of major weeds. Weeds controlled during this recent control period are listed below:

Lantana

Lantana camara (see Plate 1 below)



Plate 1: Dead Lantana controlled in the 'High Density' area in 2013-14

A majority of the 'low density' (see Figure 2) area still remains clean with it being close to weed free, as there were no observed weeds during the monitoring surveys. The size of the area declared as "low density" or weed free has increased in the past 12 months.

The 'medium density' weed areas (see Figure 2) were a majority of the works was undertaken during 2017/18 with field notes including;

29/5/18 - Cut and paint lantana using 8L of roundup Biactive mixed 1:1

30/5/18 - Cut and paint lantana using 8L of roundup Biactive mixed 1:1

Previously mapped "high density" weed areas are no longer present on-site due to the successful weed control in the areas.

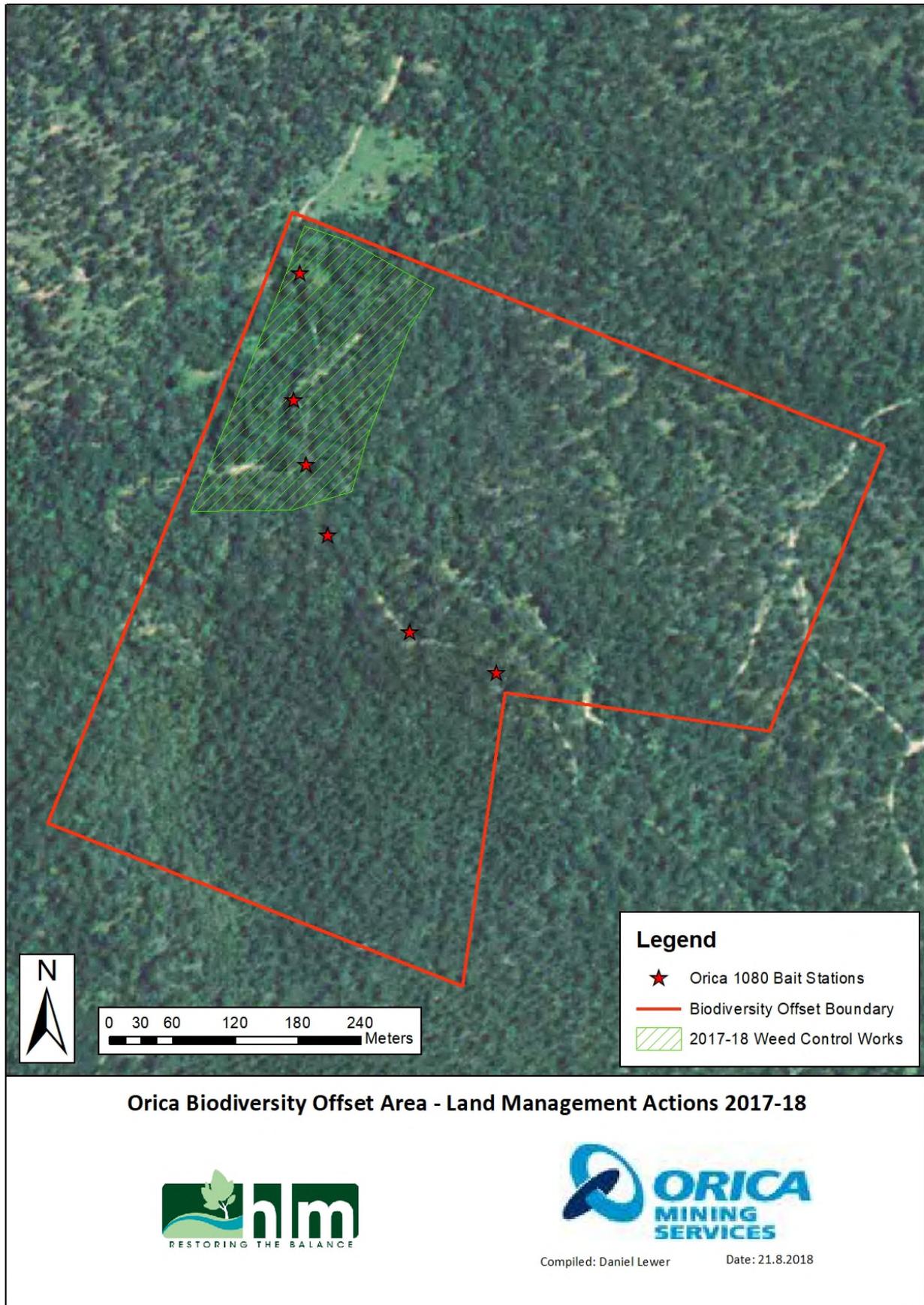


Figure 1: Orca Biodiversity Offset Area – Land Management Actions 2017-2018

1.2 Vertebrate Pest Control – 1080 Baiting

A 1080 baiting program was undertaken from 17th May 2018 through to 14th June 2018 at the locations described in Figure 1.

A total of 6 bait stations were used to present the 1080 baits. Each station consisted of a small dirt/sand mound where the processed meat injected with Sodium monofluoroacetate (1080 poison) was placed inside. The meat bait is tethered using a bamboo skewer to hold the bait in place. The skewer acts as an indicator as to whether the bait has been tampered with or taken. This ground baiting method aligns with the Code of Practice and Standard Operation Procedures – Ground Baiting of Wild Dogs and Foxes with 1080 – produced by NSW DPI.

Each station was checked on at the completion of a month's presentation with all baits not taken, removed by HLM during this check. The remaining baits are buried onsite at a depth not less than 500mm away from all water courses (as per the Pesticide Control Order 2008).

Results

Name	Date Laid	Check 1 Date	Check 1 Species	Check 2 Date and Removal	Check 2 Species
BS 1	17-05-18	25-05-18	Wild Dog	14-06-18	Fox
BS 2	17-05-18	25-05-18	Fox	14-06-18	No sign
BS 3	17-05-18	25-05-18	Wild Dog	14-06-18	Fox
BS 4	17-05-18	25-05-18	No sign	14-06-18	Fox
BS 5	17-05-18	25-05-18	Fox	14-06-18	Wild Dog
BS 6	17-05-18	25-05-18	Fox	14-06-18	Fox

2. Land Management Actions 2018-19

This section provides actions to address ongoing issues outlined in the previous section and in the “Orica Richmond Vale Biodiversity Monitoring Report – 2018” Umwelt, August 2018. The more holistic approach will help to significantly increase the biodiversity value of the BOA. Table one provides the suggested schedule for action in accordance with this plan.

2.1 Weeds

Weeds to be targeted in 2018-2019 include;

- Lantana (*Lantana camara*)
- Paddy’s Lucerne (*Sida rhombifolia*)
- Cobblers Pegs (*Bidens pilosa*)
- Flatweed (*Hypochaeris radicata*) and
- Fireweed (*Senecio madagascariensis*).

The control methods to be used for weed management in 2018-2019 should include:

Hand Removal Methods

Digging out plants: Plants with bulbs, tubers and corms must be completely removed from the soil by digging out. Often these plants will reproduce from broken off pieces.

Crowning: This technique is useful for weeds such as asparagus fern, which have their growing points below the surface of the soil. (Corms, rhizomes or tufted fibrous root systems).

Hand pulling: Hold the plant stem as close as possible to the base of the plant. Gently tug the plant. This will loosen the soil and allow the plant to come free. The plant may be hung up off the ground or piled in a heap.

Winding up: This process is suitable for plants with surface or climbing runners such as moth vine.

Herbicide Control Methods

Foliar Spraying (High Volume Spray, Low pressure back pack type)

This method requires spot spraying foliage of plants using knock down or selective herbicides.

Splatter Gun

This involves using gas powered splatter guns to distribute high concentration herbicide onto plant foliage.

Cut, Scrape and Paint (Cut Stump)

This is suitable for coppicing and suckering woody weeds such as Privet and Green Cestrum, or any weeds which are too large for hand-pulling or have long taproots. This method provides for no soil disturbance and weed eradication is successful. The cut surface is treated with a systemic herbicide immediately after cutting.

ACTION - Continue weed control focusing on Low Density Weed Areas in Figure 2 using methods outlined above during the 2018-2019 period.

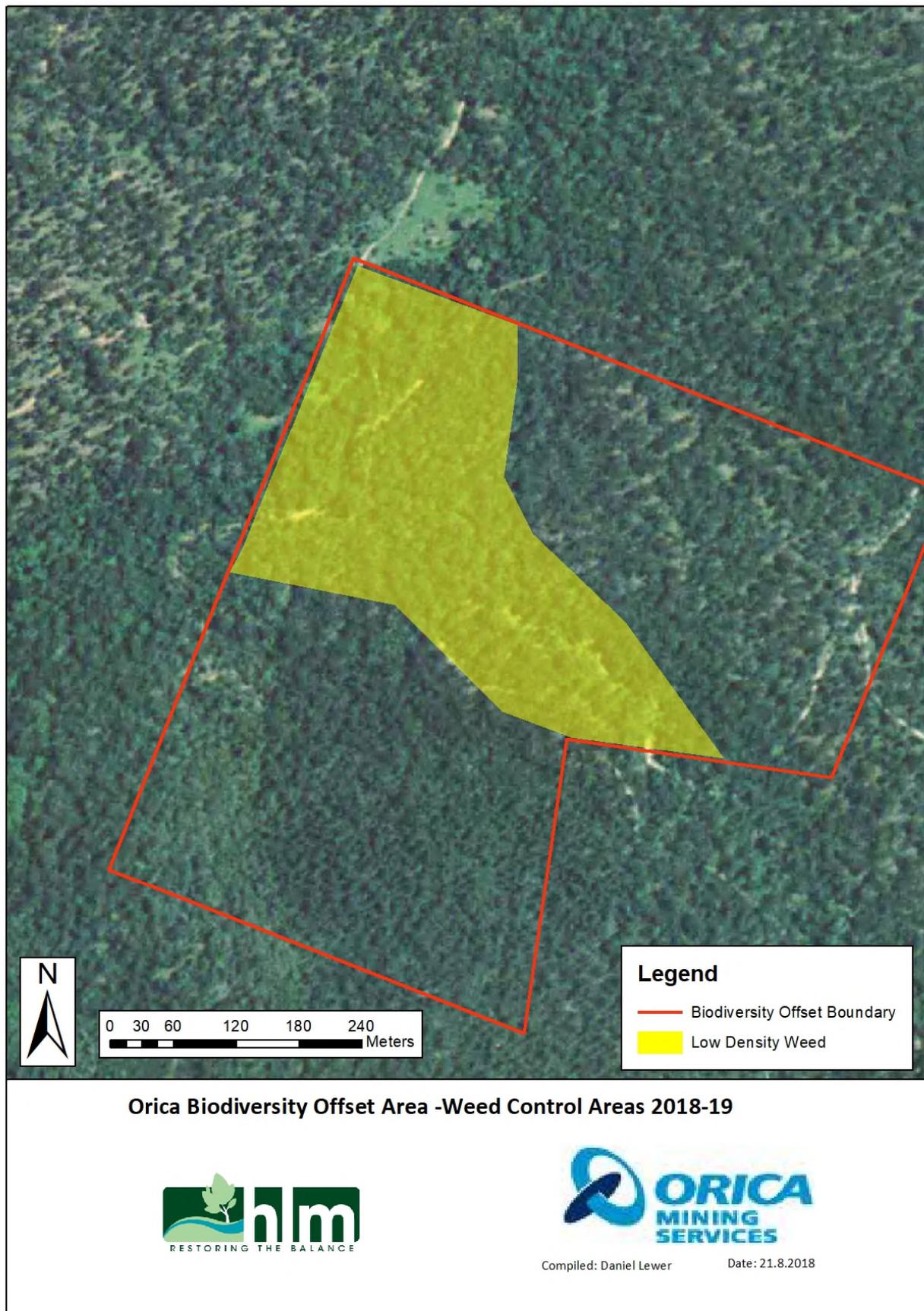


Figure 2: Orca Biodiversity Offset Area – Weed Action Plan 2018-2019

2.2 Monitoring Cameras

Install and maintain 2 motion sensor cameras on the site along track access to monitor both illegal access and pest animal presence.

ACTION – Purchase, install and maintain 2 motion sensor cameras to be checked and downloaded every 3/6 months

2.3 Vertebrate Pest Control

A 1080 baiting and/or soft jaw leg hold/cage trapping program should be undertaken on site to reduce feral predators preying on native animals in 2018-19. Pig Trapping should also be considered if feral pig activity remains during the management period. Motion sensor cameras should also be used through the program. Program should focus control on foxes and feral cats as per DPI guidelines.

ACTION - Conduct a 1080 baiting program targeting foxes and feral dogs. Undertake pig/dog trapping program if required from camera monitoring program.

2.4 Creek Erosion

Implementation of the stream remediation plan is to be continued to be investigated during this period as outlined previously in these annual reports. Its construction will halt the sources of the along with ongoing monitoring. The plan built upon the bed level survey completed during 2013-2014 and accurately assessed the requirements for remediation at the site. Plate 2 shows an actively eroding nick point at one of the tributaries of the main creek line to be addressed by the plan however this site is on the neighbouring State Managed land. This is a result of ongoing bed lowering erosion of the main creek line, resulting 'hanging tributaries' (e.g. a water fall is a hanging tributary). In the light soils of the site erosion easily occurs moving upstream to try and match the same bed level of the stream into which it is flowing. Hence if the main stream continues to erode the tributaries will also continue to erode.



Plate 2: Active erosion point on tributary to main creek

ACTION – Continue to investigate the stream remediation plan for the creek line during 2018-2019 including consultation with neighbours

2.5 Track Improvement and Access Maintenance

Use Earthmoving machinery to improve track access through the site for weed and pest management, firefighting and ongoing monitoring works. Machinery and gravel to be imported where required. An assessment of accessibility of the site inclusive of the biodiversity offset area and if required additional gates, fencing or rock barrier will be installed at access points.

ACTION – Employ earthmoving machinery to repair and upgrade track access into BOA

Table 1: Schedule of works.

	Timing				Budget Est.
	Jul – Sep 2018	Oct – Dec 2018	Jan- Mar 2019	Apr - Jun 2019	
Weed Control					\$5,000.00
Install and Maintain Monitoring Cameras					\$3,000.00
Vertebrate Pest Control (1080 baiting and possible pig trapping)					\$2,500 (Baiting) \$3,000 (Trapping)
Creek Erosion					\$20-25,000
Track Improvement and Access Maintenance					\$8,000.00
Monitor and evaluate – progress reports and 2019-20 management plan					\$3,750
TOTAL (approx.)					\$50,250.00

*HLM Rates Subject to review each financial year.

**Totals are estimates only and may vary slightly subject to factors such as amount of herbicide used etc.

3. Monitoring and Evaluation

Monitoring is a key component of this Management Plan. The main monitoring tool for this site will be the annual inspections conducted after 12 months in June 2019. This inspection forms the basis for ongoing weed monitoring at the site and assessment of effective control established throughout the 2018-19 management period. Weed control data will continue to be collected in the field using GPS technology, which provides the basis for mapping of control areas and planning for future works.

In addition to this all use of herbicide is managed in strict accordance with the label and conditions for spray such as wind, humidity and temperature. The 'Herbicide Application Record Sheet' (Appendix 1) is used to record all weather data throughout the day as well as the herbicide usage.

In addition to the annual monitoring inspections site monitoring will be conducted twice throughout the 12-month management period and a brief report provided outlining works completed, still to be done and any additional works which are not identified in the plan. This may include the control of new weeds, further waste, erosion and other issues which may or may not have been raised in this management plan.

Appendix 1. Herbicide Application Record Sheet

All chemical applications will require the detailed filling of this record sheet.



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DAILY REPORT SHEET
0001



Date:	Site: <input type="checkbox"/> Mine Site	Supervisor:	Project Manager:
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Job numbers	Times		Hours			
	Start Time	Finish Time	Normal Time	Time and a half	Double time	Total

Equipment/Plant used (tick if used)

Ute <input type="checkbox"/> Unit No:	Quikspray <input type="checkbox"/> Unit No:	Tractor <input type="checkbox"/> Make:	Mine radio: <input type="checkbox"/>	Other: (describe) <input type="checkbox"/>
Drivers/Operators:		Work Request Number		

Daily Breakdown

Time left depot:	Time arrived on site:	Crib break start/finish time:	Lunch break start/finish time:	Time left site:
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Chemical Use Record

Property/Holding: (residential address)

Applicator's Full Name:

Sensitive Areas (including distances, buffers): <div style="text-align:center"> <table border="1" style="margin:auto"> <tr><td> </td><td>N</td><td> </td></tr> <tr><td>W</td><td>Treated Area</td><td>E</td></tr> <tr><td> </td><td>S</td><td> </td></tr> </table> </div>		N		W	Treated Area	E		S		Comments (including risk control measures for sensitive areas):
	N									
W	Treated Area	E								
	S									

Application Data

Full Label Product Name:	Rate/Dose:	Water Rate @ L/ha:		
Permit No.:	Expiry Date:	Additives/Wetters:		
Total L/kg:	Applicators Initials:	Water quality(pH or description):		
Equipment type:	Nozzle Type:	Nozzle Angle:	Pressure:	Date Last Calibrated:

Weather Showers Overcast Light Cloud Clear sky

Rainfall (24 hours before and after)
 Before: mm During: mm After: mm

Time (show time in this column)	Temperature °C	Relative Humidity (%)	Wind Speed	Direction	Variability (e.g. gusting)
Start					
Finish					

Description of day's work completed/issues encountered:	Materials Used:
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HLM Staff Members Used O/N Allowance

Name:	Sign:	

Comment from / by Client

Client sign:	Client Name:
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Job Completed Job Ongoing Other Works