



## 4a Discharge permit application – general discharge to water

Please answer all questions fully. The questions provide a guide in order to satisfy the minimum information requirements that must be included with your application as prescribed in Schedule 4 of the Resource Management Act 1991 (RMA). Depending on the scale of your proposed activity, more detailed information and an Assessment of Environmental Effects (AEE) will be required to support the resource consent application.

Officers from the Greater Wellington Regional Council's (GWRC) Environmental Regulation department are available to assist with filling out this form or to clarify information to include with your application. Up to 1 hour of free pre application advice is available to you.

**This form is required to be filled out in conjunction with Form 1 Resource Consent Application**

### Part A: General information on nature and scale of your activity

**1. Is this application a renewal of an existing discharge permit?**

Yes  No  If Yes, what is the discharge permit number? WAR/WGN WGN 090091 (27209)

**2. What is/are the contaminant(s) of concern in the discharge?**

(A contaminant is any substance which is likely to change the water into which it is discharged in any way. Water can also be a contaminant)

The herbicide haloxyfop. Haloxyfop will be applied in the form - emulsifiable concentrate containing 100g/L haloxyfop-R as the methyl ester.

**3. What is the source of the contaminant and/or process that results in the discharge? (e.g. municipal wastewater, industry, water treatment, rural activity/agricultural production - cows, pigs, poultry, contaminated stormwater, other)**

The source of the contaminant is the Biosecurity Department of the Greater Wellington Regional Council. The herbicide will be discharged over no more than a two week period, a maximum of twice per year. A helicopter will be used to aerial spot spray Manchurian wild rice within the operational area. In areas that are inaccessible via helicopter, a boat will be used to access stands of Manchurian wild rice. These stands will be controlled using a motorized gun and hose unit that is mounted to the boat. In both circumstances, the application rate is 7.5 millilitres of haloxyfop per 1 litre of water.

**4. If from municipal wastewater what is the current and future size of the population the treatment plant will serve, and what is the proposed operational life of the treatment plant and associated pipework?**

N/A

5. Is the contaminant treated in any way before being discharged?

Yes  No

6. Name the treatment system and describe the treatment process (include the design specifications such as the capacity of the system):

The contaminant (haloxyfop) is mixed with water at a rate of 7.5 millilitres of haloxyfop per 1 litre of water.

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7. If sludge/solid waste is generated as part of the treatment process, please state what happens to this sludge. (Note: an additional consent will be required for the discharge of sludge to land).

N/A

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8. Describe the contaminant and expected quality of the discharge after treatment but before it enters its receiving environment:

Please provide the results from any water quality testing of the discharge. If you do not have this information, you will need to test your discharge. Indicate which contaminants have been identified in the discharge by ticking the box(es). Explain how the samples were taken (e.g. spot sample or composite sample) and attach the sampling results (laboratory analytical certificates) to this application.

Temperature °C

pH

Suspended solids g/m<sup>3</sup>

BOD<sub>5</sub> g/m<sup>3</sup>

Faecal coliforms cfu/100 mL

Heavy metals g/m<sup>3</sup>

Toxic substances (e.g. PAHs, phenols) g/m<sup>3</sup>

Dissolved and total nutrients g/m<sup>3</sup>

Ammonia g/m<sup>3</sup>:

Oil/grease g/m<sup>3</sup>

Date(s) sample taken: Please see attachment

Name of sampler: Please see attachment

Location(s) sample taken: Please see attachment

Date(s) of analysis: Please see attachment

Analysis conducted by: Please see attachment

Indicate the sampling area(s) on the locality map (question 20).

Where appropriate describe the following:

*Physical characteristics of the discharge* (such as temperature, suspended solids, turbidity)

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*Inorganic chemical characteristics of the discharge* (such as pH, free ammonia, organic nitrogen, total kjeldahl nitrogen, nitrites, nitrates, inorganic phosphorus, sulphate, metals)

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*Organic chemical characteristics of the discharge* (such as BOD<sub>5</sub>, VOC's)

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*Biological characteristics of the discharge* (such as faecal coliforms, specific micro-organisms, toxicity)

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9. What is the name of the waterbody into which the discharge will be made (e.g. name of stream, river, lake, bay, harbour, catchment, etc)?

Te Harakeke Wetland and Ngarara Stream

10. Describe the present state of the waterbody at the proposed location of the discharge.

Parameters to include in your description are flow information, water colour/clarity, width of channel, average depth, land use surrounding the waterbody, bed material (e.g. rocky, silty, etc), bank material, streamside vegetation, erosion, fish life, invertebrate life, aquatic plants.

Description as per proposed Natural Resources Plan - Schedule A3: Wetlands with outstanding indigenous biodiversity values.

See email from Biodiversity Advisor Aprille Gillon.

Greater Wellington Regional Council's Environmental Science department may be able to assist you with flow or water quality data if you have no information. Please note some applications may require a professional ecological assessment.

11. What is the quality of the receiving waterbody before the discharge? Provide sample results and interpretation of these results (e.g. against guideline values).

Please see attachment

12. Provide details of the expected quality of the receiving waters (AFTER the point of discharge, at a point after reasonable mixing). Provide sample results for existing discharges or provide anticipated results.

Please see attachment

Indicate which contaminants have been identified in the receiving waters by ticking the box(es). Attach the sampling results (laboratory analytical certificates) to this application

Temperature °C

pH

Suspended solids g/m<sup>3</sup>

BOD<sub>5</sub> g/m<sup>3</sup>

Faecal coliforms cfu/100 mL

Heavy metals

Toxic substances

Nitrates

Ammonia and dissolved reactive phosphorus

Dissolved Oxygen g/m<sup>3</sup>

Date(s) sample taken: \_\_\_\_\_ Name of sampler: \_\_\_\_\_

Location(s) sample taken: \_\_\_\_\_

Date(s) of analysis: \_\_\_\_\_ Analysis conducted by: \_\_\_\_\_

Please indicate the sampling locations (i.e. upstream, downstream, point of discharge) on the locality map (question 20)

13. Describe the method of discharge. Describe what measures will be put in place to prevent erosion or scour at the point of discharge.

N/A

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14. Describe the discharge outlet structure (e.g. 300mm pipe, multi-port diffuser, gravel trench etc.)

N/A

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15. Is the discharge continuous  or intermittent ?

16. What will be the maximum discharging period?

Please see attachment ..... hours per day

Please see attachment ..... days per week

Please see attachment ..... weeks per year

17. Describe the expected volume and frequency of the discharge?

Maximum flow rate Please see attachment ..... litres per second

Maximum daily discharge Please see attachment ..... cubic metres per day

Average Dry Weather Flow Please see attachment

Peak Wet Weather Flow Please see attachment

Max. Volume per annum Please see attachment

18. Does the discharge also involve:	Outlet structure?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	Diversion?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	Discharge to air (odour)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	Discharge to land?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

If you answered yes to any of 17 above, a separate consent application may be required. Give details of these other discharges below unless separate consent applications forms have been completed (in order to assess if further consents are required):

19. Is there any odour associated with the discharge?

No

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20. Give details of other discharge(s) occurring to the waterbody (e.g. wet weather overflows).

Describe the location, activity and source of these discharge(s) and any other details you are able to provide:

None known.

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## 21. Locality map and system design

Show the location of your proposed discharge. The sketch or plan should include, but not be limited to discharge point(s), sampling locations, location of neighbouring properties, roads, waterbodies (including streams, wetlands and drains), and other significant landmarks. Alternatively you may wish to attach a plan/aerial photograph showing the above information.

Maps are attached.

Note: Remember to indicate where north is and relevant location information e.g. distance and direction to nearest town/city. Name the waterbody(ies) shown on the map.

**Part B: Assessment of effects on the environment (AEE)**

**1. Within a reasonable distance downstream or in the vicinity of the discharge are there any:**

- (1) Obvious indications of the presence of biota (e.g. birds/nests, fish, eels, insect life, aquatic plants)? Yes  No
- (2) Areas where food is gathered (e.g. watercress, fish, kaimoana, blackberries)? Yes  No
- (3) Water abstractions? Yes  No
- (4) Wetlands (e.g. swamp areas)? Yes  No
- (5) Recreational activities carried out (e.g. swimming, fishing, canoeing)? Yes  No
- (6) Areas of particular aesthetic or scientific value (e.g. archaeological sites)? Yes  No
- (7) Areas or aspects of significance to iwi that you are aware of? Yes  No

**2. If you have answered yes to any of the above, please provide further information, including the distance of these activities from your proposed discharge point(s) and a description of what effects the discharge may have on them.**

Please see attachment

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**3. What steps do you propose to take to mitigate these effects?**

Please see attachment

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[Continue on a separate page if necessary]

**4. If there any other discharges within the same catchment, what is the combined effect of these discharges (including the proposed discharge) on the receiving environment?**

N/A

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**5. What is the length and width of the proposed zone of non-compliance (if any) to allow for reasonable mixing of the discharge in the receiving waters? How were the dimensions of this zone determined and what degree of dilution (e.g. 100:1) is provided by the end of the zone? Note: In some waterbodies it may not be reasonable to have a non-compliance zone.**

N/A

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6. Describe any noticeable change in the colour/clarity of the receiving waters that may result from the discharge:

N/A

7. What environmental effects were considered when choosing the proposed method of disposal and location (e.g. water table, dilution rates/mixing potential, proximity to waterbody)?

Environmental effects considered as per report produced by the EPA -Using Herbicides to Control Aquatic Pest Plants

<https://www.epa.govt.nz/assets/Uploads/Documents/Hazardous-Substances/Guidance/Using-herbicides-to-control-aquatic-pest-plants.pdf>

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8. What alternative methods of treatment and disposal/discharge locations were considered?

See attachment.

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## Part C: Assessment against statutory documents

1. Part 2 of Resource Management Act 1991 (RMA)

Have you provided an assessment against Part 2 (Purpose and Principles) of the RMA?

<http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM231904.html>

Manchurian wild rice is highly invasive. It displaces native vegetation by outcompeting for light, nutrients and space. It can restrict the movement of water and it causes sediment build-up in waterways, increasing the risk of flooding. Therefore, considering the potential risk that Manchurian wild rice presents, the control of Manchurian wild rice most certainly promotes the sustainable management of natural and physical resources.

2. Regional Policy Statement (RPS) & Regional Freshwater Plan (RFP) & Regional Coastal Plan if applicable (RCP)

Have you provided an assessment of the proposal against the relevant objectives, policies and rules of the Regional Policy Statement (<http://www.gw.govt.nz/rps/>), Regional Freshwater Plan (<http://www.gw.govt.nz/Regional-Freshwater-Plan/>) and Regional Coastal Plan (<http://www.gw.govt.nz/guide-to-the-regional-rules-and-regulations/>)?

N/A

**3. Proposed Natural Resources Plan (PNRP)**

Have you provided an assessment of the proposal against the relevant objectives, policies and rules of the Proposed Natural Resources Plan? <http://www.gw.govt.nz/proposed-natural-resources-plan/>

Yes, pre application consultation undertaken with Hugh Dixon-Paver.

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**4. Other relevant statutory documents**

Have you provided an assessment against all other relevant statutory documents? e.g National Policy Statement for Freshwater Management (<http://www.mfe.govt.nz/fresh-water/freshwater-management-nps>), National Environmental Standard for Sources of Drinking Water (<http://www.mfe.govt.nz/fresh-water/reform-programme/sources-drinking-water-nes/about-standard>)

GWRC is part of the MPI led 'National Interest Pest Response' (NIPR) programme, with the aim to contain Manchurian wild rice within the Kaipara District and to eradicate it from every other site in New Zealand. GWRC has a contract with MPI whereby both parties desire to work together because both organisations have biosecurity responsibilities for the control of MWR. Manchurian wild rice is an unwanted organism and notifiable organism under the Biosecurity Act 1993: propagation, spread, display and sale are prohibited.

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**5. Permitted activities**

Will you be undertaking any permitted activities as part of the proposed activity? <http://www.gw.govt.nz/regional-plans-policies-and-strategies/>

Ground spraying

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**6. Other activities that are part of the proposal**

Are there any other activities that are part of the discharge which may require consent?

N/A

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**7. Value of investment**

If you are applying to replace an existing consent, please provide an assessment of the value of the investment to which the activity relates.

Under the proposed Natural Resources Plan, Te Harakeke Wetland is defined as outstanding for it's indigenous biodiversity values. The control of Manchurian wild rice will further enhance these values.

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## Part D: Monitoring and management of your activity

1. **What monitoring and management do you propose to ensure any potential adverse effects on the environment are avoided, remedied or mitigated?** (e.g. discharge monitoring, receiving water monitoring, ecological surveys, toxicity tests). Include details on what is to be monitored, when, how, and why.

The permit holder shall sample the immediate area that haloxyfop is discharged to immediately before, and within 48 hours following discharge. The sample points will be agreed upon between the Greater Wellington Regional Council's Biosecurity Department and Environmental Science Department. Please see the map attached showing the current monitoring and sampling locations. Details that shall be sampled and recorded prior to discharge are: pH; dissolved oxygen; temperature; acid herbicides trace in water. Details that shall be sampled and recorded after discharge are: pH; dissolved oxygen; temperature; acid herbicides trace in water; fish kills.

2. **What contingency measures are proposed to deal with any system malfunction or failures so as to prevent unauthorised, uncontrolled, or only partially treated discharge to the environment?**

In the event of an accidental spill or uncontrolled discharge, the discharge of haloxyfop shall cease immediately, and the permit holder shall immediately contact the Manager, Environmental Regulation, Greater Wellington Regional Council. All other parties which provided written approval shall also be contacted immediately. The discharge shall not re-commence until the Manager, Environmental Regulation, Greater Wellington Regional Council, is satisfied.

3. **Describe how the equipment controlling the discharge to prevent equipment failure will be maintained and operated** (e.g. measures to exclude stormwater from the system, desludging, equipment maintenance).

Please see the following SOPs:

<http://ourspace.gw.govt.nz/ws/hazrsk/sops/SOP%20Biosecurity%20Operation%20of%20Motorised%20Spraying%20Equipment.docx>  
<http://ourspace.gw.govt.nz/ws/hazrsk/sops/SOP%20Biosecurity%20Management%20of%20Contracted%20Aerial%20Herbicide%20Application%20%5B1510682%5D.docx>

4. **What will be done to minimise and remediate any effects in the event of equipment failure?**

Regular servicing and maintenance of the aircraft, spray vehicle and spraying equipment aims to negate the possibility of equipment failure. If equipment was to fail, it would be highly unlikely that any spray mix would leak out and/or enter the water body. If required, there is a spill kit located in the GWRC vehicle located on site.

**Continuation page**

Question 1 continued

Signs shall be erected at access points around Te Harakeke Wetland and Ngarara Stream to notify the public that spraying of herbicide is being carried out. The signs shall be erected a minimum of two working days prior to the activity commencing and shall remain in place for a minimum of five days after the last discharge. The signs shall contain, but not be limited to, the following information:

- Warning to the public that haloxyfop is being discharged
- Date and time that haloxyfop discharge is to commence
- Location that the haloxyfop discharge will occur
- Date and approximate time that discharge is to finish
- Contact phone numbers for public enquiries.

The permit holder shall record at each discharge of haloxyfop:

- The location of the discharge
- The date of the discharge
- The times of the discharge
- The volume of concentrated haloxyfop mixed and discharged.
- Any complaints made by members of the public
- Any incidents involving the spilling of haloxyfop into a water body
- Any other relevant or unusual observations

## Part B: Assessment of effects on the environment (AEE)

1. Within a reasonable distance downstream or in the vicinity of the discharge are there any:

- (1) Obvious indications of the presence of biota (e.g. birds/nests, fish, eels, insect life, aquatic plants)? Yes
- (2) Areas where food is gathered (e.g. watercress, fish, kaimoana, blackberries)? No
- (3) Water abstractions? No
- (4) Wetlands (e.g. swamp areas)? Yes
- (5) Recreational activities carried out (e.g. swimming, fishing, canoeing)? No
- (6) Areas of particular aesthetic or scientific value (e.g. archaeological sites)? Yes
- (7) Areas or aspects of significance to iwi that you are aware of? Yes

2. If you have answered yes to any of the above, please provide further information, including the distance of these activities from your proposed discharge point(s) and a description of what effects the discharge may have on them.

- (1) Birds/nests, fish and eels may be impacted by the noise created by the helicopter. Therefore, flying is limited to two hours, on no more than two occasions per year. Aquatic plants may be affected by the application of haloxyfop. In order to mitigate the risk of non-target damage, a member of GWRC biosecurity will be present for all aerial and boat control operations to correctly identify stands of Manchurian wild rice.

Haloxyfop has been used to control Manchurian wild rice over water for the past ten years. Over the course of these ten years, the environmental impact has been less than minor (please see water quality results attached). Over the long term, the control of Manchurian wild rice is beneficial and will assist the growth of indigenous vegetation.

- (3) We are intending to control Manchurian wild rice within Te Harakeke Wetland. The potential impacts this may have include: impacts on native flora and fauna; impacts on water quality. It is worth noting that haloxyfop will not be applied directly to water. Manchurian wild rice is an emergent plant that grows up to 3m tall. Haloxyfop will only be applied to this emergent vegetation and the herbicide will be metabolised by the plant. The opportunity for haloxyfop to enter the water via spray drift is very minimal.
- (6) Te Harakeke Wetland is an area of aesthetic and scientific value. The control of Manchurian wild rice contributes to both the aesthetic and scientific values of the site. How? MWR is highly invasive, it can form permanent stands in water margins and in dry land, replacing all other species. It can cause silt to accumulate, alter water systems, cause flooding and destroy habitat for aquatic fauna and flora.
- (7) Active consultation with iwi is currently underway.

### 3. What steps do you propose to take to mitigate these effects?

#### **Aerial control**

Manchurian wild rice will be spot sprayed using the herbicide haloxyfop. Haloxyfop will be mixed at a rate of 7.5 millilitres of herbicide per 1 litre of water. Aerial spraying will be conducted using a forward mounted lance with 3 nozzle heads.

The helicopter pilot will hold the correct and current CAA and Growsafe certifications to undertake work.

### **Ground control**

Where Manchurian wild rice is inaccessible from the air, stands will be sprayed using a motorised gun and hose unit mounted to a boat. Haloxyfop will be mixed at a rate of 7.5 millilitres of herbicide per 1 litre of water. The applicator will hold a current Growsafe and/or Registered Chemical Applicator certificate.

For both control methods, the following steps will be taken:

- Spray solutions are applied strictly to manufacturer's or label recommendations;
- No mixing or diluting of chemicals takes place within 20 metres of a water body;
- All practicable steps are taken to avoid release of agrichemical over open surface water or wetland;
- No spraying is undertaken and no herbicide drift occurs outside the operational area;
- Public notifications have been undertaken in accordance with the Regional Air Plan requirements for aerial agrichemical application;
- No agrichemicals are sprayed, or applied as powders, on or above surface water bodies, artificial watercourses, a bore, or spring unless they are registered for use over waterbodies and/or a resource consent has been obtained;
- Compliance with the requirements of all other Regional Plan rules (i.e. proposed Natural Resources Plan).

### **8. What alternative methods of treatment and disposal/discharge locations were considered?**

Ground application was considered as an alternative method of control. However, using a motorised gun and hose unit within a wetland presents several problems. Much of the MWR is standing in water and is therefore inaccessible. Wading through the wetland to control MWR from the ground creates a health and safety risk for the operator.

Further to this, controlling MWR from the ground is less effective as it is difficult to discover infestations. Aerial control work has proved to be much more successful to find and control infestations of MWR.



## ANALYSIS REPORT

<b>Client:</b>	Greater Wellington	<b>Lab No:</b>	1900761	SPv1
<b>Contact:</b>	Kieran McLean C/- Greater Wellington The Regional Council PO Box 41 Masterton 5840	<b>Date Received:</b>	22-Dec-2017	
		<b>Date Reported:</b>	17-Jan-2018	
		<b>Quote No:</b>		
		<b>Order No:</b>	Paid by Credit Card	
		<b>Client Reference:</b>		
		<b>Submitted By:</b>	Kieran McLean	

Sample Type: Aqueous						
Sample Name:	Sample Point 1 14-Dec-2017 4:30 pm	Sample Point 1 15-Dec-2017 10:30 am	Sample Point 2 15-Dec-2017 11:30 am			
Lab Number:	1900761.1	1900761.2	1900761.3			
Individual Tests						
pH	pH Units	7.2	7.6	6.9	-	-
Acid Herbicides Trace in Water by LCMSMS						
Acifluorfen	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Bentazone	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Bromoxynil	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Clopyralid	g/m <sup>3</sup>	< 0.00006	< 0.00006	< 0.00006	-	-
2,4-Dichlorophenoxyacetic acid (24D)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
2,4-Dichlorophenoxybutyric acid (24DB)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Dicamba	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Dichlorprop	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Fluazifop	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Fluroxypyr	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Haloxyfop	g/m <sup>3</sup>	< 0.00004	< 0.00004	0.00027	-	-
2-methyl-4-chlorophenoxyacetic acid (MCPA)	g/m <sup>3</sup>	0.00017	< 0.00004	0.00005	-	-
2-methyl-4-chlorophenoxybutanoic acid (MCPB)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Mecoprop	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Oryzalin	g/m <sup>3</sup>	< 0.00006	< 0.00006	< 0.00006	-	-
2,3,4,6-Tetrachlorophenol (TCP)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
2,4,5-trichlorophenoxypropionic acid (245TP,Fenoprop, Silvex)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
2,4,5-Trichlorophenoxyacetic acid (245T)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Pentachlorophenol (PCP)	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Picloram	g/m <sup>3</sup>	< 0.00006	< 0.00006	< 0.00006	-	-
Quizalofop	g/m <sup>3</sup>	< 0.00004	< 0.00004	< 0.00004	-	-
Triclopyr	g/m <sup>3</sup>	0.00045	0.00005	0.00020	-	-

**Analyst's Comments**

The in-house QC procedure for Acidic Herbicides analysis showed lower than expected recoveries for fluroxypyr, MCPB, oryzalin and picloram (49%, 54%, 51% and 51% respectively). The corresponding sample result was accepted because the Laboratory Control Sample (LCS) spike recovery was within the expected ranges (105%, 106%, 95% and 102% respectively). This indicates that the low sample spike recovery was due to the matrix of the sample that was spiked.



# SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Acid Herbicides Trace in Water by LCMSMS	Acid Herbicides in water, trace level	0.00003 - 0.00004 g/m <sup>3</sup>	1-3
pH	pH meter. APHA 4500-H <sup>+</sup> B 22 <sup>nd</sup> ed. 2012. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field.	0.1 pH Units	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.



Graham Corban MSc Tech (Hons)  
Client Services Manager - Environmental



**ANALYSIS REPORT** Page 1 of 2

<b>Client:</b>	Greater Wellington	<b>Lab No:</b>	1900761	POPVI
<b>Contact:</b>	Kieran McLean C/- Greater Wellington The Regional Council PO Box 41 Masterton 5840	<b>Date Received:</b>	22-Dec-2017	
		<b>Date Reported:</b>	17-Jan-2018	
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		<b>Submitted By:</b>	Kieran McLean	

Sample Type: Aqueous					
Sample Name:	Sample Point 1	Sample Point 1	Sample Point 2		
	14-Dec-2017 4:30 pm	15-Dec-2017 10:30 am	15-Dec-2017 11:30 am		
<b>Lab Number:</b>	1900761.1	1900761.2	1900761.3		
Acid Herbicides Trace in Water by LCMSMS					
<b>Analytes Detected:</b>	2	1	3		
Haloxyfop	g/m <sup>3</sup>		0.00027		
2-methyl-4-chlorophenoxyacetic acid (MCPA)	g/m <sup>3</sup>	0.00017	0.00005		
Triclopyr	g/m <sup>3</sup>	0.00045	0.00005	0.00020	
Individual Tests					
pH	pH Units	7.2	7.6	6.9	-

Please refer to the detection limits table for the list of analytes screened and their detection limits.

**Analyst's Comments**

The in-house QC procedure for Acidic Herbicides analysis showed lower than expected recoveries for fluroxypyr, MCPB, oryzalin and picloram (49%, 54%, 51% and 51% respectively). The corresponding sample result was accepted because the Laboratory Control Sample (LCS) spike recovery was within the expected ranges (105%, 106%, 95% and 102% respectively). This indicates that the low sample spike recovery was due to the matrix of the sample that was spiked.

**SUMMARY OF METHODS**

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Acid Herbicides Trace in Water by LCMSMS	Acid Herbicides in water, trace level	0.00003 - 0.00004 g/m <sup>3</sup>	1-3
pH	pH meter. APHA 4500-H <sup>+</sup> B 22 <sup>nd</sup> ed. 2012. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field.	0.1 pH Units	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Graham Corban MSc Tech (Hons)  
Client Services Manager - Environmental



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**Detection Limits**

Analytes	Detection Limit
Individual Tests	
pH	0.1 pH Units
Acid Herbicides Trace in Water by LCMSMS	
Acifluorfen	0.00004 g/m <sup>3</sup>
Bentazone	0.00004 g/m <sup>3</sup>
Bromoxynil	0.00004 g/m <sup>3</sup>
Clopyralid	0.00006 g/m <sup>3</sup>
2,4-Dichlorophenoxyacetic acid (24D)	0.00004 g/m <sup>3</sup>
2,4-Dichlorophenoxybutyric acid (24DB)	0.00004 g/m <sup>3</sup>
Dicamba	0.00004 g/m <sup>3</sup>
Dichlorprop	0.00004 g/m <sup>3</sup>
Fluazifop	0.00004 g/m <sup>3</sup>
Fluroxypyr	0.00004 g/m <sup>3</sup>
Haloxypop	0.00004 g/m <sup>3</sup>
2-methyl-4-chlorophenoxyacetic acid (MCPA)	0.00004 g/m <sup>3</sup>
2-methyl-4-chlorophenoxybutanoic acid (MCPB)	0.00004 g/m <sup>3</sup>
Mecoprop	0.00004 g/m <sup>3</sup>
Oryzalin	0.00006 g/m <sup>3</sup>
2,3,4,6-Tetrachlorophenol (TCP)	0.00004 g/m <sup>3</sup>
2,4,5-trichlorophenoxypropionic acid (245TP, Fenoprop, Silvex)	0.00004 g/m <sup>3</sup>
2,4,5-Trichlorophenoxyacetic acid (245T)	0.00004 g/m <sup>3</sup>
Pentachlorophenol (PCP)	0.00004 g/m <sup>3</sup>
Picloram	0.00006 g/m <sup>3</sup>
Quizalofop	0.00004 g/m <sup>3</sup>
Triclopyr	0.00004 g/m <sup>3</sup>





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## ANALYSIS REPORT

Page 1 of 3

<b>Client:</b>	Greater Wellington Regional Council	<b>Lab No:</b>	1726044	SPv1
<b>Contact:</b>	Kieran McLean C/- Greater Wellington The Regional Council PO Box 41 Masterton 5840	<b>Date Received:</b>	18-Feb-2017	
		<b>Date Reported:</b>	06-Mar-2017	
		<b>Quote No:</b>	83676	
		<b>Order No:</b>	229660	
		<b>Client Reference:</b>		
		<b>Submitted By:</b>	Kieran McLean	

### Sample Type: Aqueous

	Sample Name:	S1 17-Feb-2017 9:50 am	S2 17-Feb-2017 10:30 am			
	Lab Number:	1726044.1	1726044.2			
OrganoNitrogen & Phosphorus pesticides, trace, liq/liq GCMS						
Acetochlor	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Alachlor	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Atrazine	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Atrazine-desethyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Atrazine-desisopropyl	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Azaconazole	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Azinphos-methyl	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Benalaxyl	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Bitertanol	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Bromacil	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Bromopropylate	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Butachlor	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Captan	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Carbaryl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Carbofenothion	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Carbofuran	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Chlorfluazuron	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Chlorothalonil	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Chlorpyrifos	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Chlorpyrifos-methyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Chlortoluron	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Cyanazine	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Cyfluthrin	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Cyhalothrin	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Cypermethrin	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Deltamethrin (including Tralomethrin)	g/m <sup>3</sup>	< 0.00006	< 0.00006	-	-	-
Diazinon	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Dichlofluanid	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Dichloran	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
Dichlorvos	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Difenoconazole	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Dimethoate	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Diphenylamine	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Diuron	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Fenpropimorph	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Fluazifop-butyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Fluometuron	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Flusilazole	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-



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**Sample Type: Aqueous**

<b>Sample Name:</b>		S1 17-Feb-2017	S2 17-Feb-2017			
		9:50 am	10:30 am			
<b>Lab Number:</b>		1726044.1	1726044.2			
OrganoNitrogen & Phosphorus pesticides, trace, liq/liq GCMS						
Fluvalinate	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Furalaxyl	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Haloxypop-methyl	g/m <sup>3</sup>	< 0.00004	0.00008	-	-	-
Hexaconazole	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Hexazinone	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
Kresoxim-methyl	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Linuron	g/m <sup>3</sup>	< 0.00005	< 0.00005	-	-	-
Malathion	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Metalaxyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Metolachlor	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Metribuzin	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Molinate	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Myclobutanil	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Naled	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
Norflurazon	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Oxadiazon	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Oxyfluorfen	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Paclobutrazol	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Parathion-ethyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Parathion-methyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Pendimethalin	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Permethrin	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Pirimicarb	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Pirimiphos-methyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Prochloraz	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
Procymidone	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Prometryn	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Propachlor	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Propanil	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
Propazine	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Propiconazole	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Pyriproxyfen	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Quizalofop-ethyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Simazine	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Simetryn	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Sulfentrazone	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
TCMTB [2-(thiocyanomethylthio)benzothiazole, Busan]	g/m <sup>3</sup>	< 0.00008	< 0.00008	-	-	-
Tebuconazole	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Terbacil	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Terbufos	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Terbumeton	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Terbutylazine	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Terbutylazine-desethyl	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Terbutryn	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Thiabendazole	g/m <sup>3</sup>	< 0.0002	< 0.0002	-	-	-
Thiobencarb	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Tolyfluanid	g/m <sup>3</sup>	< 0.00002	< 0.00002	-	-	-
Triazophos	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Trifluralin	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-
Vinclozolin	g/m <sup>3</sup>	< 0.00004	< 0.00004	-	-	-

## SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
OrganoNitrogen & Phosphorus pesticides, trace, liq/liq GCMS	Liquid/liquid extraction, GPC (if required), GCMS analysis	-	1-2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Graham Corban MSc Tech (Hons)  
Client Services Manager - Environmental





**ANALYSIS REPORT** Page 1 of 5

<b>Client:</b> Greater Wellington	<b>Lab No:</b> 1569018	POPv1
<b>Contact:</b> A Perrie	<b>Date Registered:</b> 16-Apr-2016	
C/- Greater Wellington	<b>Date Reported:</b> 28-Apr-2016	
The Regional Council	<b>Quote No:</b> 75466	
PO Box 41	<b>Order No:</b> 219450	
Masterton 5840	<b>Client Reference:</b> SW Haloxyfop	
	<b>Submitted By:</b> A Perrie	

Sample Type: Aqueous			
<b>Sample Name:</b>	MWR Bridge	MWR #2	
	15-Apr-2016	15-Apr-2016	
	10:10 am	10:30 am	
<b>Lab Number:</b>	1569018.1	1569018.2	
OrganoNitrogen & Phosphorus pesticides, trace, liq/liq GCMS			
<b>Analytes Detected:</b>	1	1	
Terbutylazine g/m <sup>3</sup>	0.00006	0.00007	
Multiresidue Extra Pesticides Trace in Water samples by Liq/liq			
<b>Analytes Detected:</b>	None	None	
Organochlorine Pesticides Trace in water, By Liq/Liq			
<b>Analytes Detected:</b>	None	None	

Please refer to the detection limits table for the list of analytes screened and their detection limits.

**Analyst's Comments**  
It has been noted that the method performance for Sulfentrazone for ONOP analysis is not acceptable therefore we are unable to report this compound at this present time.

**SUMMARY OF METHODS**

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Multiresidue Pesticides Trace in Water by Liq/liq GCMS	Liquid/liquid extraction, GPC (if required), GC-MS analysis	-	1-2
Multiresidue Extra Pesticides Trace in Water samples by Liq/liq			
Bendiocarb	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Benodanil	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Bifenthrin	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00002 g/m <sup>3</sup>	1-2
Bromophos-ethyl	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Bupirimate	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Buprofezin	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Captafol	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.0002 g/m <sup>3</sup>	1-2
Carboxin	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Chlorfenvinphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2



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Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Chlorpropham	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Chlozolinate	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Coumaphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Cyproconazole	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Cyprodinil	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Demeton-S-methyl	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Dichlobenil	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Dichlofenthion	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Dicofol	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.0002 g/m <sup>3</sup>	1-2
Dicrotophos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Dinocap	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.0003 g/m <sup>3</sup>	1-2
Disulfoton	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
EPN	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Esfenvalerate	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Ethion	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Etrimfos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Famphur	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fenamiphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fenarimol	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fenitrothion	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fenpropathrin	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fensulfthion	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fenthion	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Fenvalerate	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Folpet	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Hexythiazox	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.0002 g/m <sup>3</sup>	1-2
Imazalil	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.0002 g/m <sup>3</sup>	1-2
Indoxacarb	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Iodofenphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Isazophos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Isofenphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00002 g/m <sup>3</sup>	1-2
Leptophos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Methacrifos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Methidathion	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Methiocarb	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Mevinphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Nitrofen	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Nitrothal-isopropyl	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Oxychlorodane	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00002 g/m <sup>3</sup>	1-2
Penconazole	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Phorate	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Phosmet	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Phosphamidon	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Propetamphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00006 g/m <sup>3</sup>	1-2
Propham	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Prothiofos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Pyrazophos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Pyrifenox	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Pyrimethanil	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Quintozene	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Sulfotep	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Tebufenpyrad	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00002 g/m <sup>3</sup>	1-2
Tetrachlorvinphos	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2
Thiometon	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00008 g/m <sup>3</sup>	1-2
Triadimefon	Liquid / liquid extraction, GPC (if required), GC-MS SIM analysis. Roos et al (modified).	0.00004 g/m <sup>3</sup>	1-2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Peter Robinson MSc (Hons), PhD, FNZIC  
Client Services Manager - Environmental Division

**Detection Limits**

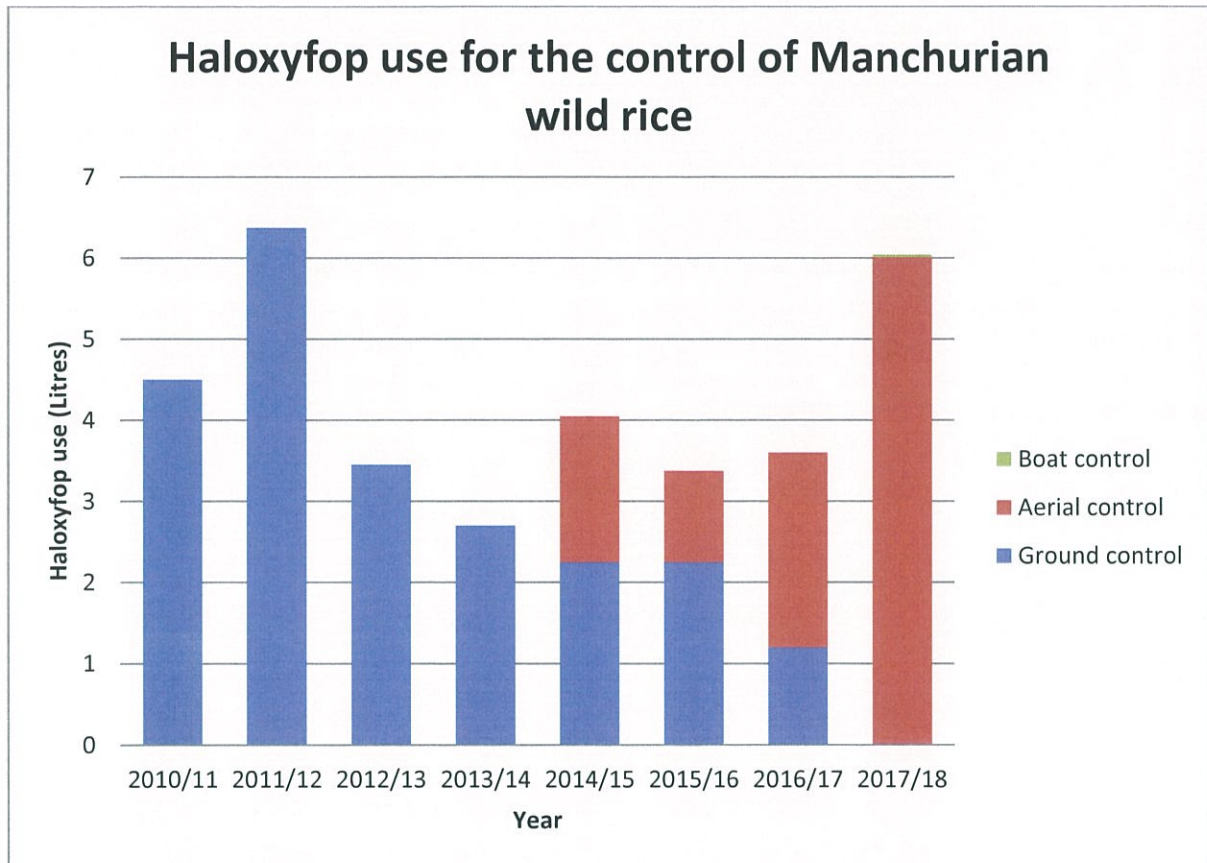
Analytes	Detection Limit	Analytes	Detection Limit	Analytes	Detection Limit
OrganoNitrogen & Phosphorus pesticides, trace, liq/liq GCMS		Oxadiazon	0.00004 g/m <sup>3</sup>	Dinocap	0.0003 g/m <sup>3</sup>
Acetochlor	0.00004 g/m <sup>3</sup>	Oxyfluorfen	0.00002 g/m <sup>3</sup>	Disulfoton	0.00004 g/m <sup>3</sup>
Alachlor	0.00004 g/m <sup>3</sup>	Paclbutrazol	0.00004 g/m <sup>3</sup>	EPN	0.00004 g/m <sup>3</sup>
Atrazine	0.00004 g/m <sup>3</sup>	Parathion-ethyl	0.00004 g/m <sup>3</sup>	Esfenvalerate	0.00004 g/m <sup>3</sup>
Atrazine-desethyl	0.00004 g/m <sup>3</sup>	Parathion-methyl	0.00004 g/m <sup>3</sup>	Ethion	0.00004 g/m <sup>3</sup>
Atrazine-desisopropyl	0.00008 g/m <sup>3</sup>	Pendimethalin	0.00004 g/m <sup>3</sup>	Etrimfos	0.00004 g/m <sup>3</sup>
Azaconazole	0.00002 g/m <sup>3</sup>	Permethrin	0.00002 g/m <sup>3</sup>	Famphur	0.00004 g/m <sup>3</sup>
Azinphos-methyl	0.00008 g/m <sup>3</sup>	Pirimicarb	0.00004 g/m <sup>3</sup>	Fenamiphos	0.00004 g/m <sup>3</sup>
Benalaxyl	0.00002 g/m <sup>3</sup>	Pirimiphos-methyl	0.00004 g/m <sup>3</sup>	Fenarimol	0.00004 g/m <sup>3</sup>
Bitertanol	0.00008 g/m <sup>3</sup>	Prochloraz	0.0002 g/m <sup>3</sup>	Fenitrothion	0.00004 g/m <sup>3</sup>
Bromacil	0.00004 g/m <sup>3</sup>	Procymidone	0.00004 g/m <sup>3</sup>	Fenpropathrin	0.00004 g/m <sup>3</sup>
Bromopropylate	0.00004 g/m <sup>3</sup>	Prometryn	0.00002 g/m <sup>3</sup>	Fensulfothion	0.00004 g/m <sup>3</sup>
Butachlor	0.00004 g/m <sup>3</sup>	Propachlor	0.00004 g/m <sup>3</sup>	Fenthion	0.00004 g/m <sup>3</sup>
Captan	0.00008 g/m <sup>3</sup>	Propanil	0.0002 g/m <sup>3</sup>	Fenvalerate	0.00004 g/m <sup>3</sup>
Carbaryl	0.00004 g/m <sup>3</sup>	Propazine	0.00002 g/m <sup>3</sup>	Folpet	0.00008 g/m <sup>3</sup>
Carbofenothion	0.00004 g/m <sup>3</sup>	Propiconazole	0.00004 g/m <sup>3</sup>	Hexythiazox	0.0002 g/m <sup>3</sup>
Carbofuran	0.00004 g/m <sup>3</sup>	Pyriproxyfen	0.00004 g/m <sup>3</sup>	Imazail	0.0002 g/m <sup>3</sup>
Chlorfluazuron	0.00004 g/m <sup>3</sup>	Quizalofop-ethyl	0.00004 g/m <sup>3</sup>	Indoxacarb	0.00004 g/m <sup>3</sup>
Chlorothalonil	0.00004 g/m <sup>3</sup>	Simazine	0.00004 g/m <sup>3</sup>	Iodofenphos	0.00004 g/m <sup>3</sup>
Chlorpyrifos	0.00004 g/m <sup>3</sup>	Simetryn	0.00004 g/m <sup>3</sup>	Isazophos	0.00004 g/m <sup>3</sup>
Chlorpyrifos-methyl	0.00004 g/m <sup>3</sup>	TCMTB [2-(thiocyanomethylthio) benzothiazole, Busan]	0.00008 g/m <sup>3</sup>	Isofenphos	0.00002 g/m <sup>3</sup>
Chlortoluron	0.00008 g/m <sup>3</sup>	Tebuconazole	0.00004 g/m <sup>3</sup>	Leptophos	0.00004 g/m <sup>3</sup>
Cyanazine	0.00004 g/m <sup>3</sup>	Terbacil	0.00004 g/m <sup>3</sup>	Methacrifos	0.00004 g/m <sup>3</sup>
Cyfluthrin	0.00004 g/m <sup>3</sup>	Terbufos	0.00004 g/m <sup>3</sup>	Methidathion	0.00004 g/m <sup>3</sup>
Cyhalothrin	0.00004 g/m <sup>3</sup>	Terbumeton	0.00004 g/m <sup>3</sup>	Methiocarb	0.00004 g/m <sup>3</sup>
Cypermethrin	0.00008 g/m <sup>3</sup>	Terbutylazine	0.00002 g/m <sup>3</sup>	Mevinphos	0.00008 g/m <sup>3</sup>
Deltamethrin (including Tralomethrin)	0.00006 g/m <sup>3</sup>	Terbutylazine-desethyl	0.00004 g/m <sup>3</sup>	Nitrofen	0.00008 g/m <sup>3</sup>
Diazinon	0.00002 g/m <sup>3</sup>	Terbutryn	0.00004 g/m <sup>3</sup>	Nitrothal-Isopropyl	0.00004 g/m <sup>3</sup>
Dichlofluanid	0.00004 g/m <sup>3</sup>	Thiabendazole	0.0002 g/m <sup>3</sup>	Oxychlordane	0.00002 g/m <sup>3</sup>
Dichloran	0.0002 g/m <sup>3</sup>	Thiobencarb	0.00004 g/m <sup>3</sup>	Penconazole	0.00004 g/m <sup>3</sup>
Dichlorvos	0.00008 g/m <sup>3</sup>	Tolyfluanid	0.00002 g/m <sup>3</sup>	Phorate	0.00008 g/m <sup>3</sup>
Difenoconazole	0.00008 g/m <sup>3</sup>	Triazophos	0.00004 g/m <sup>3</sup>	Phosmet	0.00004 g/m <sup>3</sup>
Dimethoate	0.00008 g/m <sup>3</sup>	Trifluralin	0.00004 g/m <sup>3</sup>	Phosphamidon	0.00004 g/m <sup>3</sup>
Diphenylamine	0.00008 g/m <sup>3</sup>	Vinclozolin	0.00004 g/m <sup>3</sup>	Propetamphos	0.00006 g/m <sup>3</sup>
Diuron	0.00004 g/m <sup>3</sup>			Propham	0.00004 g/m <sup>3</sup>
Fenpropimorph	0.00004 g/m <sup>3</sup>	<b>Multiresidue Extra Pesticides Trace in Water samples by Liq/liq</b>		Prothiofos	0.00004 g/m <sup>3</sup>
Fluazifop-butyl	0.00004 g/m <sup>3</sup>	Bendiocarb	0.00004 g/m <sup>3</sup>	Pyrazophos	0.00004 g/m <sup>3</sup>
Fluometuron	0.00004 g/m <sup>3</sup>	Benodanil	0.00008 g/m <sup>3</sup>	Pyrifenox	0.00004 g/m <sup>3</sup>
Flusilazole	0.00004 g/m <sup>3</sup>	Bifenthrin	0.00002 g/m <sup>3</sup>	Pyrimethanil	0.00004 g/m <sup>3</sup>
Fluvalinate	0.00004 g/m <sup>3</sup>	Bromophos-ethyl	0.00004 g/m <sup>3</sup>	Quintozene	0.00008 g/m <sup>3</sup>
Furalaxyl	0.00002 g/m <sup>3</sup>	Bupirimate	0.00004 g/m <sup>3</sup>	Sulfotep	0.00004 g/m <sup>3</sup>
Haloxypop-methyl	0.00004 g/m <sup>3</sup>	Buprofezin	0.00004 g/m <sup>3</sup>	Tebufenpyrad	0.00002 g/m <sup>3</sup>
Hexaconazole	0.00004 g/m <sup>3</sup>	Captafol	0.0002 g/m <sup>3</sup>	Tetrachlorvinphos	0.00004 g/m <sup>3</sup>
Hexazinone	0.00002 g/m <sup>3</sup>	Carbofenothion	0.00004 g/m <sup>3</sup>	Thiometon	0.00008 g/m <sup>3</sup>
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	0.0002 g/m <sup>3</sup>	Carboxin	0.00004 g/m <sup>3</sup>	Triadimefon	0.00004 g/m <sup>3</sup>
Kresoxim-methyl	0.00002 g/m <sup>3</sup>	Chlorfenvinphos	0.00004 g/m <sup>3</sup>	<b>Organochlorine Pesticides Trace in water, By Liq/Liq</b>	
Linuron	0.00005 g/m <sup>3</sup>	Chlorpropham	0.00008 g/m <sup>3</sup>	Aldrin	0.000005 g/m <sup>3</sup>
Malathion	0.00004 g/m <sup>3</sup>	Chlozolate	0.00004 g/m <sup>3</sup>	alpha-BHC	0.000010 g/m <sup>3</sup>
Metalaxyl	0.00004 g/m <sup>3</sup>	Coumaphos	0.00008 g/m <sup>3</sup>	beta-BHC	0.000010 g/m <sup>3</sup>
Metolachlor	0.00004 g/m <sup>3</sup>	Cyproconazole	0.00004 g/m <sup>3</sup>	delta-BHC	0.000010 g/m <sup>3</sup>
Metribuzin	0.00004 g/m <sup>3</sup>	Cyprodinil	0.00004 g/m <sup>3</sup>	gamma-BHC (Lindane)	0.000010 g/m <sup>3</sup>
Molinate	0.00008 g/m <sup>3</sup>	Demeton-S-methyl	0.00008 g/m <sup>3</sup>	cis-Chlordane	0.000005 g/m <sup>3</sup>
Myclobutanil	0.00004 g/m <sup>3</sup>	Dichlobenil	0.00004 g/m <sup>3</sup>		
Naled	0.0002 g/m <sup>3</sup>	Dichlofenthion	0.00004 g/m <sup>3</sup>		
Norflurazon	0.00008 g/m <sup>3</sup>	Dicofol	0.0002 g/m <sup>3</sup>		
		Dicrotophos	0.00004 g/m <sup>3</sup>		



Analytes	Detection Limit
Organochlorine Pesticides Trace in water, By Liq/Liq	
trans-Chlordane	0.000005 g/m <sup>3</sup>
2,4'-DDD	0.000010 g/m <sup>3</sup>
4,4'-DDD	0.000010 g/m <sup>3</sup>
2,4'-DDE	0.000010 g/m <sup>3</sup>
4,4'-DDE	0.000010 g/m <sup>3</sup>
2,4'-DDT	0.000010 g/m <sup>3</sup>
4,4'-DDT	0.000010 g/m <sup>3</sup>
Total DDT Isomers	0.00006 g/m <sup>3</sup>
Dieldrin	0.000005 g/m <sup>3</sup>
Endosulfan I	0.000010 g/m <sup>3</sup>
Endosulfan II	0.000010 g/m <sup>3</sup>
Endosulfan sulfate	0.000010 g/m <sup>3</sup>
Endrin	0.000005 g/m <sup>3</sup>
Endrin aldehyde	0.000005 g/m <sup>3</sup>
Endrin ketone	0.000010 g/m <sup>3</sup>
Heptachlor	0.000005 g/m <sup>3</sup>
Heptachlor epoxide	0.000005 g/m <sup>3</sup>
Hexachlorobenzene	0.00004 g/m <sup>3</sup>
Methoxychlor	0.000005 g/m <sup>3</sup>
Total Chlordane [(cis+trans)* 100/42]	0.00002 g/m <sup>3</sup>



## Haloxyfop use for the control of Manchurian wild rice



### Points worth considering

- Haloxyfop use increased from 2013/14 – 2014/15 with the introduction of aerial control work. Aerial control methods allowed operators to access stands of Manchurian wild rice that were previously inaccessible by land. Increased access to stands of Manchurian wild rice meant that more haloxyfop was used to control Manchurian wild rice.
- Haloxyfop use increased from 2016/2017 – 2017/2018. This can be explained by a change in control methods. The national standard for best practice states that Manchurian wild rice should be sprayed with haloxyfop two times per year during the growing season. In 2017/18 Greater Wellington Regional Council achieved two control operations, hence the increase in haloxyfop use.





# Mancharian Wild Rice Monitoring / Sampling Points

Topographic and Cadastral data is courtesy LINZ. LIDAR data is courtesy GNS. Regional Orthophotography is courtesy GNS. GNS NZAN 2010. 2013. Projection NZTM.

0 50 100 Meters

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 & Development

Document Path: \\isoler\VGW\_2015.mxd  
 Date: 15.04.2016





Location of proposed activity - Te Harakeke Wetland and Ngarara Stream, Waikanae