Protocol for Sampling

and Testing Blood Plasma for 1080

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1. Introduction

This sampling protocol has been prepared for general practitioners, pathology laboratories, and Medical Officers of Health (MOH), who may be involved in the process of sampling blood from patients to assess the possibility of recent (within 48 hours) exposure to 1080. It provides information on sampling, handling, transport, contact names, and the costs involved. Samples are received and analysed by the Toxicology Laboratory at Landcare Research, Lincoln.

Sodium monofluoroacetate (Compound 1080) is a highly water-soluble vertebrate pesticide, used in the control of possums and rabbits. Pest control operations using 1080, particularly the aerial distribution of 1080 baits, are closely monitored by Medical Officers of Health, and in some cases it may be specified that samples from waterways close to operational areas are tested for 1080 (see the Protocol for Environmental Water sampling and Testing Associated with 1080 Pest Control Operations).

Though the likelihood of the general public being exposed to 1080 as the result of pest control operations is considered low, circumstances may arise where people present themselves to their local GP and request a test for 1080 exposure.

This protocol may also be used by the Department of Conservation or local bodies to submit blood samples from animals where recent 1080 exposure is suspected.

2. Sampling

Blood samples will be taken in 10-mL vacutainer tubes (green top – sodium heparin) and spun down at a local pathology laboratory to provide plasma* samples for transport to the Toxicology Laboratory. Samples should be kept chilled (3-10°C) before despatching.

*The use of plasma samples instead of serum samples will be reviewed once a comparison of the behaviour of 1080 in the two materials has been assessed.

3. Sample integrity

The limit of detection for the testing method is some 500,000 times lower than the typical concentration in possum baits (the method limit of detection is 3 parts per billion (ppb) for blood samples). Hence the method for testing the sample is extremely sensitive and even minute amounts of

1080 may be detected. Sample containers must not, therefore, become contaminated with 1080 in any way, even externally.

4. Sample labelling

Samples must be labelled to uniquely identify each sample and include the date and time that the sample was taken. This information will be used to identify samples on the laboratory report. The laboratory report is confidential and will be disclosed to the submitting laboratory or the patient only, unless appropriate written permission is given. A sample form is included on the last page of this protocol and may be photocopied as required. It must accompany all samples submitted to the laboratory for testing. If submitting details are incomplete, the processing of the sample may be delayed until these can be supplied.

5. Transport Requirements

Blood plasma samples should be transported chilled (3 – 10°C) to the testing laboratory within 2 days of taking the samples. This is best accomplished by including freezer packs with the sample set and packing in a polystyrene chilly bin.

Samples are to be sent to:

Laboratory Manager
Toxicology Laboratory
Landcare Research
54 Gerald Street
Lincoln, Canterbury 7608

Samples should be sent by courier door-to-door. No special declaration is required.

On receipt, the samples will be entered in the laboratory sample register and placed in a freezer at -20°C to await analysis, or, if urgent, analysed immediately.

6. Testing Procedures

Samples will be entered on the laboratory work schedule and tested as soon as possible. Testing is usually completed within 7 working days (maximum 15 working days). The **24-hour service** for critical samples requires the following:

- Warning of 1 day before sample arrival

- Samples must be received at the laboratory by 10.30 am. on the day of testing
- The service will be available on a Friday only if a client representative will be available on Saturday to receive results
- No more than 10 samples can be tested on a 24-hour basis

Results will be available by 10 am on the following day.

Testing is carried out using the gas chromatography method TLM 005, "Assay of 1080 in water, soil, and biological materials by GLC". This method was developed by Landcare Research, Lincoln, based on the work of Ozawa & Tsukioka (1987, 1989).

Blood plasma samples, after precipitation with acetonitrile and separation of the protein, are added directly to 2% sodium chloride solution and are then ready for the derivatisation step.

The solution is acidified with hydrochloric acid and converted to the dichloroaniline derivative by using N,N'-dicyclohexyl carbodiimide (DCC) and 2,4-dichloroaniline (DCA). The derivative is cleaned on a silica solid-phase extraction cartridge, eluted with toluene, and quantified by gas chromatography with electron-capture detection. The limit of detection is 3 µg/L in a 2-mL plasma sample.

An IANZ-endorsed laboratory report will be provided to the client on completion of the work. The matching of results to patient details and interpretation of the results are the responsibility of the submitting medical practitioner.

7. Prices

The prices for testing for 1080 in blood plasma samples as of 1 July 2019 are as follows:

Standard rate	
1 – 3 samples	$820 per sample
4 – 6 samples	$628 per sample
>6 samples	$568 per sample

These prices are exclusive of GST. For a price for larger numbers of samples please contact the Laboratory Manager, Phone 03 321 9617; Fax 03 321 9998; e-mail: boothl@LandcareResearch.co.nz.

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8. References

Booth, L.H., Wright, G.R.G. 2016: Guideline for sampling and testing of water associated with monitoring of aerial 1080 baiting operations. *Landcare Research, Lincoln.*

Booth, L.H., Wright, G.R.G. 2016: Protocol for sampling and testing urine for 1080. *Landcare Research, Lincoln.*

Booth, L.H., Wright, G.R.G. 2016: Protocol for tissue sampling and testing for vertebrate pesticides in animals. *Landcare Research, Lincoln.*

Ozawa, H.; Tsukioka, T. 1987: Gas chromatographic determination of sodium monofluoroacetate in water by derivatization with dicyclohexylcarbodiimide. *Analytical Chemistry 59:* 2914–2917.

Ozawa, H.; Tsukioka, T. 1989: Determination of monofluoroacetate in soil and biological samples as the dichloroanilide derivative. *Journal of Chromatography 473:* 251–259.

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TOXICOLOGY LABORATORY

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SAMPLE DETAILS FOR 1080 IN BLOOD PLASMA

Analytical results for these samples will be reported to the client shown below only

Client details
Contact name:……...
Organisation:……
Address:……
Phone:……..Fax:……..
Date sample sent:……
Email address……

Invoice details (if different from client details)
Contact name:……...
Organisation:…….
Address:……
Phone:……..Fax:……..
Email address: ……..

Test requirements:
Urgent/standard* turnaround:…….

Sample identification	Date/Time taken	Remarks

*15 working days maximum

Please return to:

Laboratory Manager
Toxicology Laboratory
Manaaki Whenua - Landcare Research
54 Gerald Street
Lincoln 7608
Fax: 03 321 9998

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