
METHAMPHETAMINE TESTING USING FIELD COMPOSITE SAMPLES

TECHNICAL NOTE

Field Composite samples are collected from up to five individual locations, and are sent to Analytica for testing. They can be tested using Individual Analysis, or Laboratory Composite Analysis. This Technical Note describes these options, and how to interpret the results from them.

Background

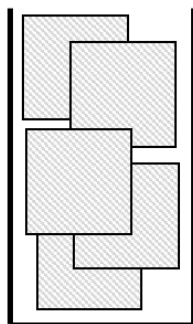
'The New Zealand Standard for Testing and Decontamination of Methamphetamine-contaminated Properties' (NZS 8510) was published by Standards New Zealand in June 2017. Included in there is the option of suitably qualified samplers collecting Field Composite samples from properties that can be used for screening or post-decontamination analysis of the property.

Samplers are responsible for collecting samples that are compliant with NZS 8510.

Individual Analysis

An Individual Analysis occurs when each Field Composite sample is tested individually by the lab, and a separate result is given for each Field Composite sample.

**Individual Field
Composite tubes
(up to 5 wipes each)**



**Each sample is tested
individually in the
laboratory**



What results are given?

The report provided for Individual Analysis tells you the total level of methamphetamine, amphetamine, ephedrine and pseudoephedrine found in each Field Composite sample. This result is a total of all the wipes in a tube. This result cannot be directly compared with levels specified in NZS 8510.

An example of this is shown below. In this example the methamphetamine result for 'Sample 4' is 3.63 µg/sample, from a 5 sample composite. This result is above the level of 1.5 µg/100 cm² specified in NZS 8510. Because there were 5 locations sampled the result is actually from a 500 cm² area and hence can't be directly compared to the NZS 8510 level.

It is best to interpret a Field Composite result as the 'worst case scenario' – that is, the level in one of the wipes if it had all of the contamination and all other wipes had none. Using 'Sample 4' as an example, the result is 3.63 µg/sample. This is above the NZS 8510 threshold of 1.5 µg, meaning that it is possible that one of the samples has methamphetamine at a level above the NZS 8510 threshold. The only way of knowing if one of those samples was that high would be to go back to the property and carry out more sampling using Discrete kits. As the wipes are all combined into the same tube at the time of testing it is not possible to separate out the individual wipes and accurately test them.

Results Summary

Methamphetamine and Related Compounds

Field Composites

Laboratory ID	Sample ID	Samples in Composite	Methamphetamine	Amphetamine	Ephedrine	Pseudoephedrine
			µg/sample	µg/sample	µg/sample	µg/sample
			0.04	0.04	0.04	0.04
XX-00004-1	Sample1	5	3.50	0.11	<0.04	0.34
XX-00004-2	Sample2	2	0.13	0.05	<0.04	0.10
XX-00004-3	Sample3	3	1.81	0.08	<0.04	0.22
XX-00004-4	Sample4	5	3.63	0.16	0.04	0.44

What are the advantages of Individual Analysis of Field Composite samples?

- The report provides a result for each individual Field Composite tube, each of which represents a total of up to five locations.
- Initial sampling in the field is quick (and therefore less expensive) as less set up and handling per sample is required.

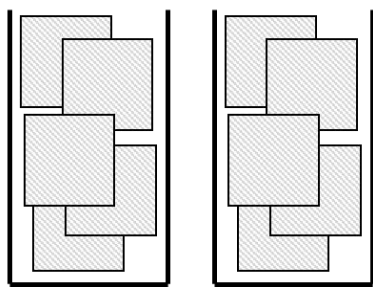
What are the disadvantages of Individual Analysis of Field Composite samples?

- Individual Analysis costs more, as each sample has to be individually run on the laboratory instrument.
- Results only give you a total result of the combined wipes in a Field Composite tube. It is not possible to subsequently test each wipe individually to get a result per location.

Laboratory Composite Analysis

Laboratory Composite Analysis sees Field Composite samples being prepared individually, but a sub-sample of up to 2 samples are combined together to form a single composite sample that is run on the laboratory instrument.

**2 Field Composite tubes
(up to 10 wipes)**



**Combined into a single
sample at the laboratory**



What results are given?

The report provided for Laboratory Composite testing tells you the level of methamphetamine, amphetamine, ephedrine and pseudoephedrine found in the composite sample. This result is the average of **the 2** samples included in the composite sample, and cannot be directly compared with NZS 8510.

An example of this is shown below:

Results Summary

Methamphetamine and Related Compounds

Lab Composite of Field Composite Samples

Laboratory ID	Sample ID	Samples in Composite	Methamphetamine	Amphetamine	Ephedrine	Pseudoephedrine
	<i>Units</i>	-	$\mu\text{g/sample}$	$\mu\text{g/sample}$	$\mu\text{g/sample}$	$\mu\text{g/sample}$
	<i>Reporting Limit</i>	-	0.04	0.04	0.04	0.04
XX-00003-1	Sample1	5				
XX-00003-2	Sample2	5				
XX-00003-3	2 Sample Composite (XX-00003 #1-2)	2	1.81	0.08	<0.04	0.22

In this example, 2 Field Composite samples were submitted to the laboratory for Laboratory Composite testing. The result of 1.81 μg of methamphetamine in the sample is the average of the 2 samples – but we can't work out the levels of individual samples without asking the laboratory to analyse them individually. Our laboratory retains the original Field Composite samples for three weeks after initial testing, and these can be tested individually on request.

A Theoretical Maximum Level is also displayed on the Laboratory Composite report (see below). This value is calculated from the composite result, by multiplying the composite result (1.81 µg in this example) by the number of samples included in the composite (2 in this example). The Theoretical Maximum Level is a 'worst case scenario' – if just one of the Field Composite samples included in the composite had all of the contamination, and all other samples had no contamination.

Theoretical Maximum Levels

Laboratory ID	Sample ID	Samples in Composite	Theoretical Max Methamphetamine	Theoretical Max Amphetamine	Theoretical Max Ephedrine	Theoretical Max Pseudoephedrine
	<i>Units Reporting Limit</i>	-	µg/sample 0.04	µg/sample 0.04	µg/sample 0.04	µg/sample 0.04
XX-00003-3	2 Sample Composite (XX-00003 #1-2)	2	3.63	0.16	0.04	0.44

In this example, the Theoretical Maximum Level is 3.63 µg/sample. This is well above the NZS 8510 threshold of 1.5 µg, meaning that it is possible that one or more of the samples contain methamphetamine at a level above the NZS 8510 threshold. The only way of knowing which of the samples is high is to request Individual Analysis of the samples or to go back to the site and carry out more sampling using Discrete kits. Individual re-test results of the 2 samples in the composite only give you a total result of the wipes in each Field Composite tube. It is not possible to test each *wipe* individually.

What are the advantages of Laboratory Composite testing?

- It is much cheaper to test a group of samples using a Laboratory Composite Analysis than to test each sample individually. This allows for a cost effective up-front screening test of a property.
- It is of particular benefit in a situation where there is thought to be a low risk of the property being contaminated with methamphetamine.
- Samples are held for three weeks after testing, and can be tested individually if required during that time.

What are the disadvantages of Laboratory Composite testing?

- This type of testing does not initially give you a result per individual sample. Since the result is an average of all the samples included in the composite, a Theoretical Maximum Level must be used to see if there is a risk of any one of the samples having a high level of methamphetamine.
- As such, the test is useful for confirming that a property is not contaminated (if the Theoretical Maximum Level is below 1.5 µg/sample) but cannot be used to investigate levels of contamination without further Individual Analysis or resampling.

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