Government of **Western Australia**
Department of **Health**

Guide for testing and remediation of methylamphetamine and illicit drug residues in residential properties

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Contents

1 Purpose of this Guide

This Guide describes a procedure for the testing and remediation, including validation, of residences contaminated by manufacturing (clandestine drug laboratories, clan labs) or smoking illicit drugs, especially crystal methylamphetamine (meth, ice). Noting that there is considerable commonality in the management procedures, where guidance differs from that for smoke-related contamination items relating to **drug manufacturing** are highlighted in bold. The differences are summarised in Appendix 1.

2 Scope

The document is intended for illicit drug contamination testing and remediation companies operating in Western Australia investigating and managing surface residues. It may be relevant to others involved in the associated regulatory, assessment or management processes.

Service providers will still need to take account the site circumstances and evolving best practices along with their relevant experience in applying this guidance for illicit drug residue work.

The process outlined here is designed to reduce surface residue levels below those that may pose any risk to human health and below any national health investigation level (HIL) for the relevant drug.

Although the guidance is suitable for all illicit drug residues, the emphasis in relation to smoke residues will be on those from meth due to their frequency and potential health risks.

3 Background

Although property contamination from manufacture of illicit drugs has been of concern since the early 2000s, impacts from smoking meth have only been recognised as a potential risk for occupants in the last 5 or so years, primarily due to increased property drug residue testing.

The national guidance on illicit drug manufacture contamination management is the Clandestine Drug Laboratory Remediation Guidelines 2011 (National Guidelines) published by the Commonwealth Department of Home Affairs.

Two of the main documents that help to characterise surface contamination from smoking meth and so inform management guidance are the Assessment of contamination levels in methamphetamine-tested properties in New Zealand and the Methylamphetamine Smoke House Research Report.

The above work, together with other documents listed in the Bibliography section, underpin this guide and the management principles in Section 4.

4 Basic management principles

The management principles are outlined below.

- Where a property is assessed for possible illicit drug residue, it can be assumed that the source is smoking meth unless there is a reasonable suspicion or evidence of a clan lab, as outlined in 6.1 and 6.1.1. Illicit drug residue is approximately 100 times more likely to be present as a result of illicit drug use (i.e. meth smoke houses) than manufacturing (i.e. clan lab).
- Surface residue from smoking meth will often be present at relatively low levels, averaging below 3 µg/100cm^2 for positive wipe samples (but with single measurements ranging up to 30 µg/100cm^2), as compared with manufacturing the drug which may generate a much larger range of average levels and could exceed 100 µg/100cm^2.
- The National Guidelines HIL for meth of 0.5 µg/100cm^2 apply regardless of whether residues found are from smoking or manufacture.
- Residue from smoking other illicit drugs, such as cannabis or cocaine, may be remediated utilising the same remedial methods used for smoking meth. More rigorous methods are outlined for any illicit drug manufacturing, including meth**.**
- Although contamination from meth manufacture normally will be substantially higher than from smoking meth, if the Nazi/Birch production method has been used, as is common in Western Australia, the associated process and relatively smaller-scale production results in lower concentrations than labs using other (e.g. phosphorous) methods.
- Any meth or illicit drug impacts can be widespread on surfaces within a building or structure due to dispersal during smoking or manufacture (or both) and since smoking may occur in multiple locations.
- Any surface impacts will tend to increase vertically (relative to the surface material), for instance on walls. However, horizontal surfaces may also have substantial contamination due the settling of dust impacted by illicit drug aerosols.
- The main exposure pathway for contaminated surfaces is dermal absorption and ingestion via repeat surface contact and hand to mouth behaviours, most relevant to infants and young children. Inhalation exposure at higher surface contamination levels (e.g. surface meth impacts > 40 µg/100cm^2) may be relevant and is the subject of further research.
- For meth smoke residues, transfer from any impacted surfaces by re-aerosolisation to other surfaces, including clean furniture, new fixtures, items moved into a home, or remediated surfaces, is expected to be negligible. **However, this may not be so for the high levels associated with manufacture, or with situations of forced air flows over highly contaminated surfaces.**
- The nature of the material and any surface coating are factors that influence the level of residue and remediation outcome. Non-permeable or highly polished surfaces often yield higher readings and are most easily cleaned. The ease of cleaning will be less so for other surfaces and the residual meth or other drug residue may be less likely to be released in normal exposure situations.

- Unless contamination levels for different surfaces in a room vary greatly, those surfaces with the greatest readily and frequently contactable areas, for instance bench tops, door handles, walls (at child height) and floors, will pose the greatest exposure risk and should be the primary targets for remediation.

5 Proper and ethical process

For any illicit drug assessment or remediation, service providers need to have the necessary competencies, follow regulatory guidance, and maintain strict ethical standards. Service provider requirements vary across Australian jurisdictions. In Western Australia (WA), the Department of Health (DoH) lists companies that have been reviewed as capable of sampling, remediation and laboratory analysis work in accordance with available guidance in Companies qualified for testing and remediating drug residues.

Competency requirements include:

- appropriate qualifications and training
- relevant experience
- familiarity with and adherence to local regulatory guidance material
- availability of resources and operational processes.

It is also important that any service provider hold relevant insurance policies, especially professional indemnity insurance and public liability insurance, at levels which cover the nature and value of the relevant work and any liability which may arise from a failure of that work.

This document is the primary reference for illicit drug assessment and management in WA. For matters not addressed in WA guidance, national or other regulatory guidance from other jurisdictions may be referenced and used, followed by, if necessary, established industry practices. The approach used would need to be fully justified in associated reporting.

In public health-related matters, including house habitability, local government, may direct action in accordance with this or other guidance material as part of directions or notices issued under the *Health (Miscellaneous Provisions) Act 1911,* with non-compliance subject to infringements.

In some situations (e.g. contractual or other service provision arrangements), the Department of Consumer Protection will be the main arbiter of a dispute. That agency may draw upon the DoH expertise in this regard, including referencing guidance.

Normally the assessment, remediation and validation activities are three distinct areas of work, although the service provider who does the assessment would also be best placed to do the validation, especially since the remediation process may be based on their recommended remediation action plan.

In undertaking any estimate of work or undertaking the work itself, a service provider should maintain strict ethical standards including:

- only undertaking work for which they have the necessary qualifications or competencies
- properly interpreting the significance of the residue levels identified
- ensuring remediation work is appropriate and justifiable (proportionate) to address the level of contamination or risk identified
- giving consideration to what is reasonably practicable, subject to client needs and protective precautionary principles
- having no conflicts of interest, for instance the testing or validation entity should be different from the company that undertakes the remediation.

6 Investigation and assessment

The following sequence of activities is likely to apply in seeking to address or manage potential illicit drug contamination.

- **Preparation**, necessary prior to each of the following activities.
- **Investigative sampling and assessment**, including development of a sampling plan, and remediation action plan (RAP) if contamination is identified.
- **Remediation**
- **Validation**

For properties that have been identified as clan labs by government agencies such as the WA Police Force, there may be a written regulatory direction about what needs to be done, often issued by the Local Government Authority. Accompanying documentation for clan labs typically include a WA Police Force Clandestine Laboratory Attendance and Notification Form and a Clandestine Drug Laboratory Contamination Report from the ChemCentre.

For each of the sampling, remediation and validation tasks an associated report should be prepared, as indicated in Section 9, Reporting.

The management process is shown as a flow diagram in Figure 1. At each stage the owner needs to be consulted, and insurance company and/or regulatory authority, before proceeding

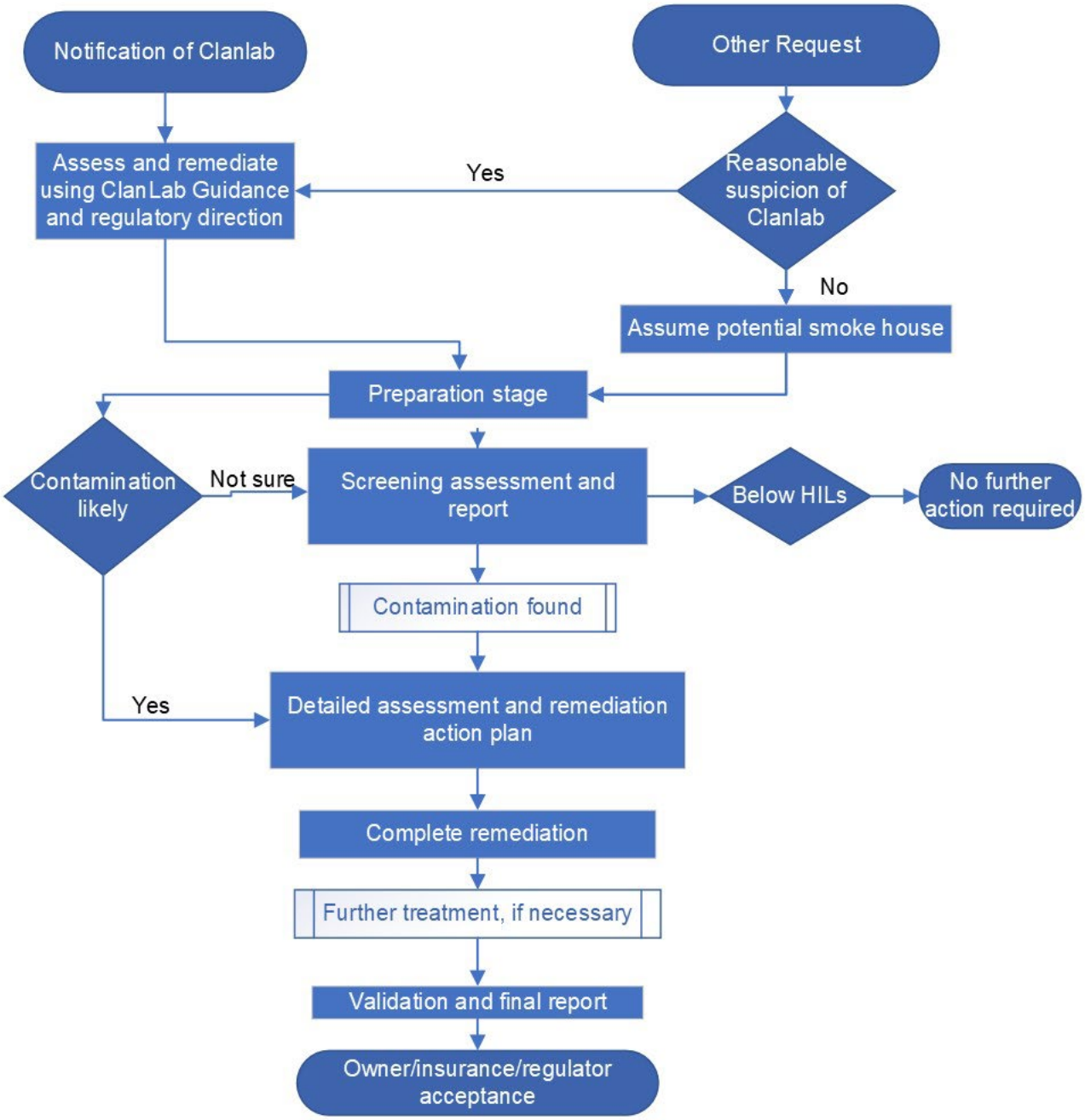

Figure 1 Management Stages

6.1 Preparation

A service provider should prepare and execute the work based on the client's requirements, site circumstances, the company's own procedures, the advice from this Guide and any regulatory direction that is provided.

In addressing a client's needs, it may be appropriate to refine these needs based on informing the client about illicit drug contamination risks and management, to ensure the agreed work is commensurate with what is realistically warranted and is not excessive.

Additional considerations, which will also inform the development of a sampling plan, include:

- the availability of documentation or results associated with previous relevant activities, investigations or testing at the premises
- anecdotal information about activities at the site that may have resulted in contamination e.g. how many possible smokers, duration of possible contaminating activities, and likely impacted areas
- identifying any other risks that may need to be managed to protect personnel such as electrical hazards, property condition, presence of drug use paraphernalia (e.g. hypodermic needles etc), aggressive dogs or uncooperative or even belligerent occupants
- availability of building plans to guide work and assist report writing, and identifying any areas that are inaccessible
- any information on possible previous cleaning or redecoration, and possibly locations of removed furniture that may interfere with identifying contamination
- an on-site visit to inform the subsequent work, including viewing the outside areas.

6.1.1 On-site visit

An on-site visit is recommended but may not be necessary depending on the nature of the available information before finalising and commencing planned activities.

An on-site visit can identify relevant safety, assessment or remediation issues not apparent from available information alone.

The first step is to undertake a systematic walkthrough of the relevant buildings and surrounding areas, preferably accompanied by the owner or someone familiar with the location and the relevant activities which may have occurred.

It is important to note evidence of illicit drug manufacture such as:

- **chemical staining or residues (e.g. white caustic)**
- **associated discarded equipment**
- **empty cold and flu (pseudoephedrine) blister packs**
- **other related materials as detailed in Appendix 2.**

Extra care will need to be taken where any unknown or suspicious chemicals or chemical containers (including gas cylinders) are identified.

Suspicion of drug use or the presence of surface residue alone is not generally justification to support a recommendation for occupants to vacate a property. However, when the property is occupied, a competent person may recommend that it be vacated if documentation, forensic, analytical or physical evidence or other material facts suggest the occupants may be at an unacceptable risk.

6.1.2 Health and safety

During the preparation stage, any site-specific health and safety issues should be identified, and control measures proposed to mitigate these issues, and be further adjusted when necessary.

In most cases, a service provider should have existing safe work procedures for working in illicit drug contaminated environments and have appropriate training, supervision, protective equipment, waste disposal and incident response procedures.

The minimum level of personal protective equipment would normally include gloves, P2 mask, shoe covers, work boots and a first aid kit.

Any enclosed spaces, including residence and outbuildings, should be ventilated to the extent practical prior to entry and work.

The relevant workplace legislation in WA relating to hazardous substances management is the *Work Health and Safety (General) Regulations 2022*.

If a property has not been vacated, the occupants or their animals may also pose a safety concern. WorkSafe provides guidance on potential for aggression in the workplace at: www.commerce.wa.gov.au/worksafe/aggression-workplace-toolkits-and-information-resources

In case of an illicit drug laboratory, the range and degree of hazards may be greater especially if it was not identified as part of police operations, and therefore associated equipment and chemicals may remain on site. If this evidence is found, the police should be notified.

A particular concern with some clan labs is possible presence of residual airborne aerosols or gases. These will depend on the type of drug and process and are likely to be a greater risk if the activity was recent and the related area unventilated.

To help ensure that safety precautions are appropriate to the nature of a site, the example 'Site Entry – Safety Analysis Checklist' at Appendix 3 may be of assistance.

6.2 Sampling and assessment

6.2.1 Health investigation levels

Health investigation levels (HILs) have been established for many drugs and chemicals associated with their illicit manufacture. For Australia including WA, these are listed in the Clandestine Drug Laboratory Remediation Guidelines (National Guidelines). The HILs describe the concentrations of a contaminate above which further appropriate investigation and evaluation will be required. Though not intended for the purpose, they are often adopted as clean up or remediation target levels, since it can be reasonably assumed that those substances present at levels below the HILs are unlikely to pose a significant risk to human health. However, a case may be made to apply a site specific clean up goal based on the site's individual risk circumstances, and in consultation with DoH.

The National Guidelines were developed for illicit drug manufacturing activities and the HILs consider exposure through air and soil as well as indoor surfaces, and also

different user situations, for instance commercial as well as residential. If there are soil or groundwater impacts, it may be necessary to apply HILs from the *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).*

The primary illicit drugs of concern that have Australian HILs are meth and MDMA. There are also HILs for individual chemicals that are present in products used for various methods of manufacture. However, some manufactured illicit drugs and associated chemicals do not have HILs, for instance cannabis oil extraction. As discussed later, some remediation in these cases is still warranted.

For commonly smoked drugs, surface residue can be measured against a HIL for meth and MDMA, but not for tetrahydrocannabinol (THC, from cannabis), heroin and cocaine. All five drugs have been found as contaminants at drug seizure sites in WA, often together. For those without an established HIL, it is not known what surface levels may constitute a public health risk. However, based on their chemistry and exposure characteristics they are likely of less concern than meth smoke residue.

DoH considers that if testing is prompted for illicit drug-related contamination, it should normally only focus on meth, unless other chemicals with HILs are being investigated associated with drug manufacture, such as MDMA, lithium and iodine.

If there are specific concerns about THC (there may be odour from cannabis smoking), heroin or cocaine, they can be sampled for using the same processes (not presumptive testing) and, if found they should be remediated as per general procedures outlined in this Guide.

6.2.2 Sampling plan and methodology

The main reasons for sampling are usually to identify or screen for the presence of residues, to characterise the nature and extent of any residue (detailed assessment), or to validate the effectiveness of any remediation.

A sampling plan should always be prepared and provided to client to keep them informed on what to expect. The data objectives for the sampling plan should be clearly articulated.

Normally the main target areas for sampling will be surfaces within buildings to which occupants may be exposed. **For possible manufacture situations it may be necessary to undertake more extensive sampling, including indoor air, ventilation systems and/or waste disposal (e.g. drains, outdoor soils).**

The sampling plan should take account of the client needs, data gaps, site circumstances (preferably based on a visual site inspection) and the information provided in this Guide. In many cases the sampling plan may be based on a standard approach and amended to the specific circumstances.

The plan may include provision for additional sampling or analysis based on the initial findings, especially if presumptive tests are positive.

Any validation testing will also require a plan, although this confirmatory work may be much simpler than the original investigative sampling.

Indoor surface samples should be collected using NIOSH Method 9111 Methamphetamine on Wipes by Liquid Chromatography/Mass Spectrometry. While this method specifically relates to meth, the sampling procedure are suitable for other drugs such as MDMA. NIOSH method 9111 states a sample is collected using a solvent soaked wipe and is swabbed across a 10 cm x 10 cm (100 cm^2) surface area, defined by a disposable template, with 3 passes (alternating in direction). The NIOSH recommended solvents for the wipe are methanol or isopropanol. Use of methanol may be preferable, depending on laboratory practices, as it may be a more effective solvent for collecting some illicit drugs, such as meth.

The swabbing process may vary a little, based on laboratory guidance, or as outlined in NIOSH Method 9111 to take account of methanol versus isopropanol as the swab's solvent, or if the surface tested is rough rather than smooth.

6.2.3 Screening assessment

This is primarily undertaken when there is little information or evidence of illicit drug activity at a property, with view to demonstrating its absence or, if found, prompting the need for a detailed investigation.

Discrete wipes for individual laboratory analysis are the preferred choice for screening, taking account of cost and timing issues and their reliability and quantitative results.

Presumptive tests or laboratory composites may be used for screening, subject to proven reliability and proper practice. In all cases surface sampling area should be consistent with NIOSH 9111; i.e. over a 10 cm x 10 cm surface area.

Consideration should be given to the accuracy and reliability of any presumptive test selected for use. The presumptive test has been developed primarily for meth contamination and for the purposes of this Guide should indicate a positive or negative result for meth above or below the HIL for a high-use residential setting of 0.5 µg/100cm^2. These results can help direct the need for any further characterisation and sampling.

To allay any uncertainty about the reliability of a new presumptive test, in the absence of external independent verification, it is advisable that for every 5 negative results, a discrete wipe sample be taken from the most suspect location and submitted for laboratory analysis. If ongoing experience indicates that the presumptive tests are consistently reliable then the additional confirmatory laboratory analysis process during screening sampling can be discontinued.

The use of field composites for screening is not supported; being 10 cm x 10 cm swab samples that are aggregated by the tester on site into a single tube prior to sending to the laboratory for testing.

The use of laboratory composites for screening is acceptable provided that indoor surface samples are collected in accordance with NIOSH 9111. When submitted, the laboratory extracts each sample as an individual sample, but then combines equal portions of the extracts to form a new sample, being the laboratory composite. The laboratory composite is analysed. Since the remainder of each parent sample is still retained initially by the laboratory, each can still be

separately analysed (de-composited) to get a specific result, should the composite result indicate that this is necessary.

A laboratory composite should not consist of not more than 5 discrete samples across multiple rooms.

Note that the composite sample result cannot be directly compared with the HIL. The composite result is more accurately reported, consistent with NIOSH 9111, as the result per total surface wipe area (e.g. per 500 cm^2 for a 5-sample composite) and must not be modified or reported as a result over 100 cm^2. Where a competent person interprets the composite result as an indication that the HIL could be exceeded in an area, some (depending on situational knowledge) or all the individual samples can be analysed (de-composited) to characterise the contamination against the HIL.

The communication and reporting of composite results must not include reference to a "theoretical maximum" as this is a misleading, artificial number and is highly unlikely to be represented of a real situation (given normal drug distribution patterns). This approach is known to have been used to misrepresent the level and extent of contamination to clients.

It should be noted that the results of presumptive and composite (on a combined basis) samples are for screening purposes and may not necessarily be acceptable for legal purposes.

Also, it is recommended that holding times for any laboratory composite are considered and that samples should not be de-composted and analysed after being held for four weeks, unless the laboratory can demonstrate the reliability of the process.

Other sampling may be considered. **For example, if manufacture is suspected or believed to have occurred then a portable photo-ionisation detector (PID) may be used to indicate the presence of volatile organic chemicals, such as solvents. Given the convenience of the PID and real-time results, each room in the house and any other suspect structure can be screened in this way.**

When initial sampling in a garden is prompted due to indicators of waste disposal from manufacture, this may include sampling the suspect material itself or soil that appears to be impacted. The chemical analysis should include analytes associated with the particular drug and the manufacturing process used, if known.

6.2.4 Detailed assessment

A detailed assessment may be undertaken, without initial screening, where there is supporting evidence or strong belief that a property is likely to be contaminated. This sampling provides quantitative measures of the level of surface contamination, which gives an indication of risk level and the type of remediation necessary. A detailed assessment may also follow from the screening assessment where positive results indicate residues present may be above health investigation levels.

If likely areas of manufacture are being assessed for volatile organic chemicals (VOCs) in air, whether or not based on previous PID positives, such air contamination should be sampled using a published reference method (e.g. AS 2986.1 – 2003 Workplace air quality

– Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography, Part 1: Pumped sampling methodology). For VOCs or any other relevant air contaminants, sampling should be based on the recommendation of the NATA accredited laboratory being used.

If soil contamination was identified in the garden associated with disposal of manufacturing waste, the area and depth of the contamination may need to be determined by more detailed sampling, unless the character of the chemical and type of contamination allows for progression to the remediation stage. For outdoor sampling, 30-50 grams of each waste material or relevant surface soil should be collected. The National Guidelines set out procedures for this type of sampling, and the HIL table lists chemicals commonly associated with drug manufacture, which can be used to determine the analytical suite.

6.2.5 Sample locations

Where indicated by the initial assessment, sampling should be undertaken in all rooms or indoor spaces that may be occupied or used on a regular basis (high-use areas). Those spaces will include connecting passages, and possibly also garages (especially with direct residential access) and sheds.

Levels of any surface residues can vary greatly due to many factors including: source and location, ventilation systems, type of surface material, whether cleaning has occurred, height and inclination (i.e. vertical or horizontal) of the surface.

In the first instance it is important to identify the presence of residue and the level of risk to inform a commensurate remediation process, while taking a sufficiently precautionary approach in situations of uncertainty.

Appendix 4 provides information on possible sampling locations, sample numbers/frequency, follow up sampling after initial positive sampling results and the nature of any remediation indicated. As highlighted in that guidance, the assessor or site-specific circumstances may dictate different patterns of sampling.

Important considerations in determining sampling locations and frequency for initial screening or detailed assessment include:

- implementing a consistent sampling approach, especially in relation to locations and surfaces, to the extent practical across all spaces in the property
- including sampling of high yielding surfaces in the initial assessment (e.g. oil-based paints, varnished timber, or tiles) and/or the most likely surfaces that residue may be found (such as stained materials), especially those with larger accessible surface areas
- increasing the number of sampling locations in larger spaces by taking an additional sample for each 10 m^2 or substantial part thereof of floor area
- using a higher sampling rate in kitchens, at least by twofold, because of the likelihood of association with contaminating activity, the high level of occupant time spent there, and the potential for food preparation on contaminated surfaces

- noting or avoiding sampling of areas where cleaning (e.g. countertops or floors) or new surface treatment (e.g. repainting) is likely to influence the result
- select areas for sampling that are accessible and likely to be most frequently used by occupants.

There is usually no need to sample inaccessible or maintenance access areas such as ceilings/ceiling fixtures and roof or crawl spaces, or locations that are atypical such as ventilation system surfaces, **except in cases where lab-type contamination may have occurred**.

Properties would not need to be tested for any migration of contaminant.

For clan labs, located under a common roof with other properties and where there is shared ventilation or air spaces, testing of connected spaces may be required. This would only be necessary where there is evidence of significant contamination of a property because of clan lab activities.

Any air sampling in properties where drug manufacture has occurred should target the likely air contaminants and likely contamination locations. This will be informed by the results of surface contamination sampling and of any PID (photo-ionisation detector) readings.

The air sampling should focus on VOCs or other airborne chemicals associated with the likely manufacture process that have HILs. Air sampling for meth is not warranted unless there is evidence of illicit drug manufacture and/or there are multiple surface residues results above 40 µg/100m^2.

6.2.6 Ventilation system sampling

Where there is evidence of drug manufacture or very high surface contamination (including through very heavy drug smoking), then sampling of certain types of ventilation/temperature control systems may be warranted.

For split system air-conditioning systems, it can simply be more cost effective to undertake remediation without testing, including filter replacement and cleaning of the internal unit.

Ducted evaporative systems do not typically have an extraction vent and airflow is normally positive (i.e. one way into the home), and as such these systems and ducting will not generally require any testing.

For ducted air-conditioning systems, of most concern is likely to be any ducting or equipment acting as contamination reservoirs and releasing potentially contaminated air into living spaces. For such systems it is recommended that a discrete swab for laboratory analysis is taken from the ducting just inside the vent (within arm's reach), or if this impractical, e.g. for fibrous surfaces, then of the vent opening/grille.

6.2.7 Quality control

To ensure the integrity of the sampling and its results it is important to:

- ensure the sampling equipment and materials are properly stored and are within use-by dates, if applicable
- collect samples in accordance with the sampling method (e.g. NIOSH Method 9111 or manufacturer instructions), label with sufficient information to identify the location of the sample, if possible, take a photo of the location
- change disposable gloves and templates between each sample
- protect other associated materials against cross contamination and, if necessary, clean
- take a field blank sample for every 20 samples
- complete a chain of custody form
- provide suitable storage and transport of samples intended for laboratory analysis.

6.2.8 Interpretation of results

If properly conducted screening sampling does not indicate residues present above health investigation levels, then further assessment or management would normally not be necessary.

If screening sampling indicates contamination above the HIL is likely, then those impacts will need to be quantified by further laboratory-related sampling and/or analysis.

Any living area deemed to exceed the relevant HIL will need to be remediated. One or more marginal exceedances should be considered in the context of the site circumstances, and it may be determined that the HIL is not exceeded for the assessed space or room. Any such decision regarding exceedance of HILs would need to be justified and documented.

High yielding surfaces may sometimes give high results, such as near or above 15 µg/100cm^2. Sampling of high yielding surfaces is used to optimise identification of presence of the drug. There may be much lower levels on the walls which will better determine the level of overall risk to occupants.

In the absence of any evidence or suspicion of illicit drug manufacture, the residue found would normally be attributed to smoking the relevant drug and is usually found at a relatively low level. However, heavy meth smoking can sometimes result in high levels of contamination.

Meth smoke residue is often characterised by averages of less than 3 µg/100cm^2, usually centred in personal (e.g. toilet, bedrooms) and communal spaces, such as lounge rooms. Individual outlier levels of up to 30 µg/100cm^2 are possible. Meth manufacturing contamination is likely to have averages into the multiples of 10 µg/100cm^2, with individual samples of more than 100 µg/100cm^2. Residue from manufacturing is often most concentrated where water, sinks, electricity, and preparation areas are available, such as kitchens or laundries. More pronounced concentration gradients are also commonly observed in sampling results moving away from the manufacture areas. Passive and active ventilation will spread the illicit drug aerosol extensively in either case. Also worth noting is that drug manufacturers will commonly also be drug users or smokers and the two patterns may superimpose.

Most illicit drug residues, especially if consistent with the corresponding typical patterns, should be deemed as drug smoking related and managed accordingly.

If the property was notified as a clan lab there may be a direction to remediate it on this basis without further risk assessment.

For some illicit drugs and chemical residues associated with any manufacturing methods, there may be no HILs. In these cases, remediation may still be undertaken, taking into account any regulatory direction, and be done to the extent that is reasonably practicable.

Manufacturing illicit drugs other than meth is normally identified as part of a clan lab investigation. They include the extraction of cannabis oil (from cannabis plant), making of gamma-hydroxybutryric acid (GHB), preparation of "homebake" heroin, and the extraction dimethyltryptamine (DMT) (from some types of vegetation). These substances generally pose a relatively low risk of secondary exposure and the processes, particularly the extractions, will not involve drug aerosol generation, in which case, contamination is generally localised from spillage.

Drug manufacture situations which may pose a high risk and need expert advice would include manufacture or processing of any synthetic opioid, such as fentanyl and its analogues.

If ventilation duct sampling has been conducted, remediation/replacement of the ducting system could be prompted if the swipe sample exceeds 2 µg/100cm^2.

While the nature and extent of surface residue can be characterised from sampling data, confirmation of the source and length of time since the residue has been present is not possible to determine from sample results alone. Determining culpability may need to rely on contextual information such as the presence of activities suggesting drug use or making, including those listed in Appendix 2.

If there are concerns about THC, heroin or cocaine or other smoked drugs without HILs, they can be sampled for using the same processes (not presumptive testing) and, if found, remediated as outlined in this Guide. The justification for remediation should take account of the likely length, level and frequency of use. In the case of these drugs, if there is confidence that remediation has been properly conducted based on this Guide there is no need for validation sampling as there are no published specific clean-up targets for these drugs.

Illicit drug impacts, whether from manufacture or smoking, that require management, should prompt the preparation of a remediation action plan.

7 Remediation action plan

The remediation action plan (RAP) is best developed by the professional who conducted the assessment report because the assessment provides key site-specific information including the characterisation of the contamination. Therefore, the assessor is required to have sufficient expertise and experience to determine the type and extent of remedial work that is required.

An illicit drug cleaning company will have its own standardised procedures and equipment which may cause it to vary from the RAP. Ideally, the owner, the tester and the cleaning company should discuss the preferred way to undertake the cleaning/remediation, which is justifiable, cost-effective, and consistent with this Guide and **any other regulatory requirements**.

The recommended remediation should be based on the level of contamination. **More rigorous measures, including removal and disposal of impacted items, is warranted if there is heavy contamination or evidence of manufacture.**

Important additional considerations that affect exposure potential and therefore remediation action include the:

- accessibility of impacted items or structures, especially for children
- ease and cost of cleaning those elements vs replacement
- owners' emotional attachment to those elements.

In basic terms the RAP should normally outline:

- the nature of acceptable occupancy during the process
- what areas and materials need to be remediated, or, if necessary, disposed of including justification for any significant disposal of items or stripping
- broad guidance on how they should be remediated
- the applicable remediation standard, where available
- contingency measures for initial remediation failure
- how remediated areas should be validated.

The remediation and validation processes are described in much more detail in subsequent sections of this Guide.

7.1 Occupancy

If contamination is localised, then occupants may remain living in other non-impacted parts of a property. However, it is recommended that they are not present during the cleaning process. For instance, occupation might occur if contamination above the HIL is confined to one bedroom or in the garage. However, contamination may affect multiple areas, some of which may be important for the proper functioning of a household, such as a kitchen. In these cases, the size and extent of the remediation may prompt temporary relocation of any occupants.

Any advice provided to occupants which suggests that vacating the property is required due to risk must be justified. Depending on the circumstances, where residue is identified above HILs the short-term on-going occupation of a property, pending remediation, may present a lower risk than the loss of a secure place of residence, noting that occupants already may have lived in the property for some time.

7.2 Remediation areas

Any areas or materials known or reasonably considered to be contaminated should be identified for remediation. If the sampling process demonstrates residue on a surface area above the HIL, 0.5 µg/100cm^2 for meth, the impacted surfaces should be treated as contaminated and, depending on the site-specific circumstances and sampling data objectives, possibly other surfaces in the room that are represented by the sample results. In some cases, residue on high yielding surfaces, such as doors, might be significant while the wall residues are below-HIL; which might just prompt cleaning of the high yielding surfaces.

In some cases, area or surface specific remediation may be possible, especially if informed by the results of representative sampling. It is also worth noting that some clients such as insurance companies may prefer precautionary broad rather than targeted cleaning.

In the case of any notified clan lab, the production area/s should be remediated, unless directed otherwise, even if there is no corresponding HIL e.g., THC. Depending on the aerosol dispersal character of the manufacture process and local ventilation systems, other rooms may need to be assessed for remediation.

The RAP should preferably list or depict these areas in the form of a table, property plan or both, with the associated residue levels included. Figure 2 provides an example of such a graphic, with the red areas subject to remediation based on HIL exceedances.

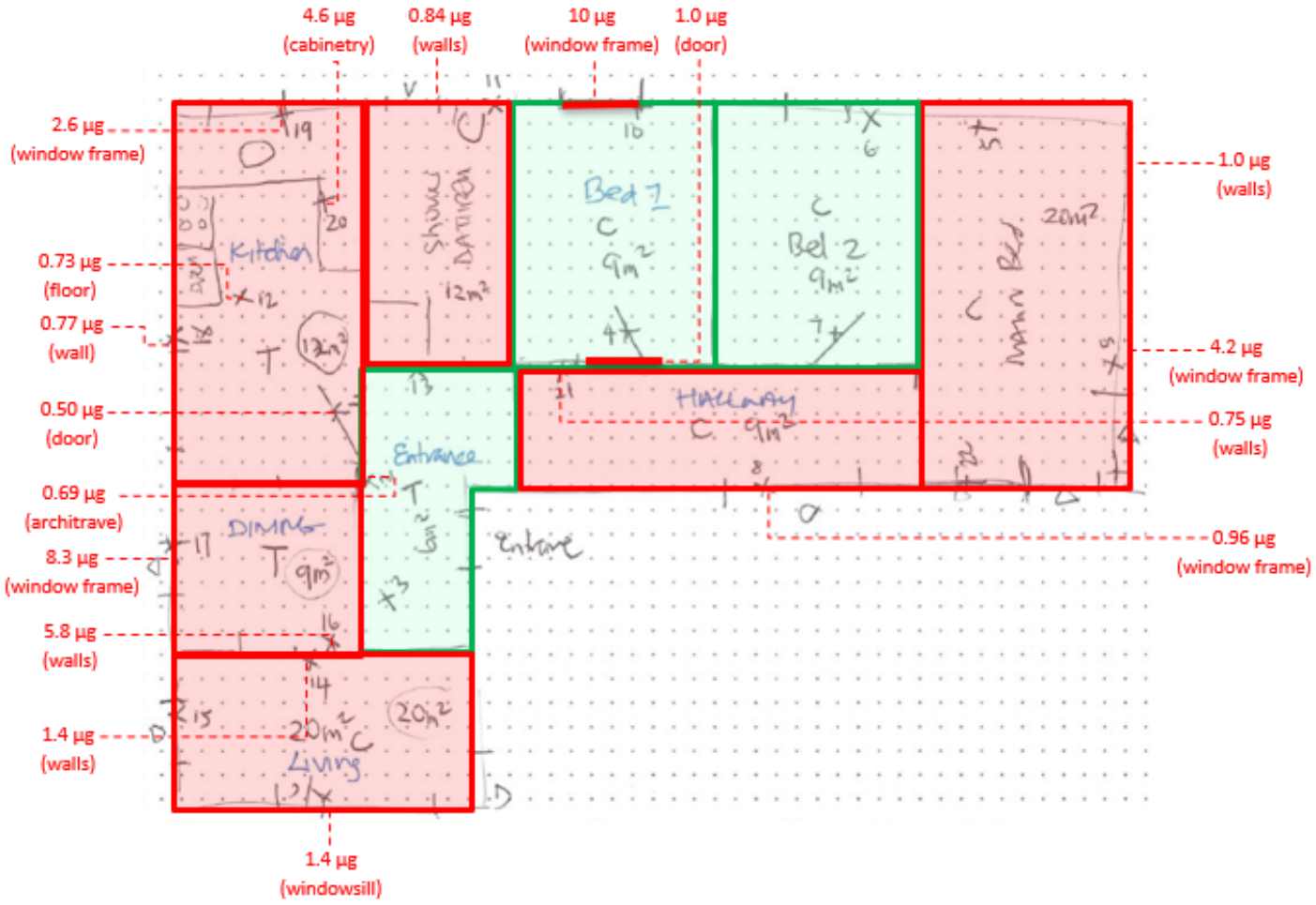

Figure 2 Site Plan

7.3 Remediation procedure

The different identified contaminated components of the property may often prompt differing remediation procedures and can include:

- internal building structural surfaces
- personal possessions present during manufacture or smoking
- household goods and equipment
- furniture and fixtures such as inbuilt cupboards, windows and floor coverings
- **garden areas**
- **ventilation/air-conditioning systems**.

The remediation processes normally will be outlined to some extent in the RAP and remediation options are described in more detail in the remediation section of this Guide.

Although other areas not intended for occupation may have some residues, e.g. roof voids and drains, in the case of a smoke house, the exposure potential, especially to vulnerable receptors such as infants and young children, would normally be marginal and do not normally require any investigation or consideration for remediation for protection of public health.

The RAP should recommend the validation sampling methodology. This guidance should be consistent with Section 8.

8 Decontamination

The remediation company may develop its own scope of work based on the objectives of the RAP, this Guide (including Appendix 4) and discussions with the owner and the assessor. The remediator should be independent to the assessor and not be involved in the sampling or validation testing.

The key elements of the remediation process may include some or all the following:

- ventilating all impacted and work areas, where practical
- establishing a personal protective equipment (PPE) change area,
- establishing a decontamination area for items that will be cleaned on-site
- relocating impacted movable items for decontamination or disposal
- cleaning interior surfaces using high-efficiency particulate air (HEPA) filter vacuum
- cleaning the necessary interior surfaces using an appropriate solution e.g., detergent water solution
- cleaning on-site impacted movable items and removing to a clean area,
- remediating the impacted fixed surfaces
- **remediating any external areas associated with manufacture waste disposal**
- undertaking repeat cleaning based on the results of validation sampling
- disposing of waste liquids and solids through drains or at a suitable waste facility, respectively
- preparing a decontamination report on completion of the process.

Items and spaces not contaminated or which have been cleaned and validated should be isolated from ongoing remediation work. Depending on the contamination distribution in a property, it may be desirable to undertake the remediation in a particular directionally flow through the property.

The approach to remediation will be informed by the level of contamination and what is reasonably practicable to achieve. It may be sufficient to undertake selected area cleaning or to vary the remedial approach for different surfaces, even in the same room e.g. where high yielding surfaces such as entry doors indicate contamination while walls do not. In the case of kitchens, some surfaces may lend themselves to cleaning such as laminate, while any untreated timber may warrant stripping out. For any such practicable, selective remediation, there would need to be sufficient confidence based on the testing and the site circumstances.

At high levels or where residue is suspected or known to be the result of illicit drug manufacture the remediation may need to be more intensive and on-site cleaning of movable objects may not be viable. Also, if a laboratory was large, very dirty or subject to an explosion or fire, then remediation may include stripping out and/or demolition of items that are damaged or not practicable to remediate.

Although remediation processes are recommended commensurate with proper management of illicit drug contamination, it is at the discretion of the tester or remediator to customise the

approach based on associated uncertainties or site circumstances However, risk-based justification should be provided and documented where procedures differ from this Guide.

8.1 Area ventilation

The areas requiring ventilation would normally be those which are contaminated, and any spaces being used for cleaning movable items on-site or areas for PPE donning/doffing.

Ventilation consists of natural cross ventilation from opening of doors and windows and/or the use of fans and blowers in the relevant rooms where necessary. Using any existing forced ventilation system, optimised to source outdoor air, may also be worth considering for a presumed smoke house, as this will only help purge the likely low levels of contamination within the system. **However, such a system should not be used if a property is known/suspected of illicit drug manufacture associated with aerosol generation.**

Ventilation should commence as part of the initial setting up of the remediation each day and continue during that work. The need for it afterwards will depend on the nature of the cleaning chemicals used and be based on the remediator's preferred approach.

8.2 Change and work areas

The change area will depend on the remediator's procedures and deployed facilities e.g., dedicated decontamination vehicles. In certain cases, it may occur outdoors including in a covered area such as a carport.

Some items may be suitable for cleaning using the washing machine or dishwasher. For (re)moveable items that can be cleaned on-site, this should be done in designated work area dedicated to this activity.

The main work area can be an existing clean one in the property or one that is minimally contaminated, for instance with a sampling result of about 1 µg/100cm^2 or less. There should be no carpets or soft furnishings present. It could be in a garage or carport given their size and opportunities for ventilation.

The designated work area should be as close as practical to the rooms being cleaned to minimise cross-contamination along the transfer route.

8.3 Relocation of removable items

For non-vacated properties there will be potentially impacted removable items. In vacated premises some fittings may be removeable for cleaning separately to fixed surfaces, e.g. window furnishing like curtains and blinds.

For presumed drug smoke house situations, the low-level residue likely associated with most movable items, would mean that washable items can be retained once they are cleaned.

For illicit drug making situations or where there is heavy contamination, the opportunity to effectively remediate and retain removable items will be reduced, for practicality and risk reasons.

Noteworthy is the difference between items present during smoking **or manufacturing activities**, and those introduced after those activities ceased, such as new occupants bringing

their possessions into a previously contaminated property. For the latter, the potential for residue to transfer to the introduced items would be low, depending on the level of residues present and time since the new occupation.

For smoke contamination situations, personal and household goods that most likely warrant decontamination or possibly disposal are anything exposed or used over an extended period in a high drug use area and that have not been washed or cleaned.

In the case of illicit drug manufacture or other heavy meth contamination, the following items would likely need to be disposed of:

- **materials that are visibly stained, emitting odour (noticeable in ambient air), damaged, or likely to have been used in illicit drug production processes, such as storage structures for precursor chemicals**
- **materials that are absorbent and difficult to clean, including paper materials (books, documents), and soft furnishings such as couches, rugs, mattresses, pillows and heavy curtains**
- **items with a high potential for human contact and not able to be readily decontaminated, such as children's toys, bottles and possibly food-preparation surfaces and smaller kitchen items.**

Items that would normally be remediated rather than disposed of would include all large kitchen appliances such as fridges/freezers, cook tops and ovens etc and electronic devices, given their high value and impervious surfaces.

Any item for disposal should be made unusable to ensure it is not re-cycled or re-used.

Household goods would not need to be packaged or wrapped for relocation within a property because of the limited opportunity of contact cross-contamination.

Some of the impacted goods may be more suitable for off-site cleaning, such as the laundering of heavy curtains or bedcovers, subject to agreement by the laundering facility. In these cases, they should be bagged or wrapped in heavy plastic during transfer to the facility.

Household items and materials to be disposed to landfill will normally be considered general waste and will not fall into a hazard waste category. Disposal at landfill should be directly into the landfill to ensure materials are not removed from transfer stations and re-cycled. Australian research has indicated that meth contamination will normally degrade quickly in a landfill environment and not pose any risk to health or the environment.

8.4 Cleaning process

8.4.1 HEPA vacuuming

After anything removable is taken from the impacted area, HEPA vacuuming is appropriate **especially in situations of illicit drug manufacture or heavy meth contamination**.

HEPA vacuuming of impacted carpets should occur to minimise transfer of any contamination during carpet disturbance regardless of whether they will be remediated or removed for disposal.

HEPA vacuuming should be focussed on accessible horizonal surfaces, particularly floors but also counters and windowsills. Vacuuming the ceiling is not justified **except perhaps in cases of drug manufacture in that room.**

8.4.2 Surface clean

Cleaning solutions or products used will depend on what is available and the remediator's related experience. Normally for the low-level contamination associated with a smoke house, an alkaline detergent in water would be suitable. **For higher level contamination, such as may be associated with drug manufacture, especially on permeable surfaces, there may be a need to employ a more intensive cleaning approach, including use of stronger cleaners designed to remove the specific illicit drug, such as meth.**

In any case, the chemicals should be relatively safe to use, for either workers or occupants, and be applied based on manufacturer's instructions.

Cleaning may be done on a whole space or targeted surface basis depending on the results of the sampling and the site circumstances. Surface specific cleaning is a more likely option in smoke house situations. Appendix 4 provides additional guidance on selective remediation of areas as informed by sampling.

The process should consist of the chemical clean followed by rinsing with clean water, for as many times as necessary. However, if meeting the HIL or other criterion (e.g., site-specific target) is not achieved after three wash cycles then other remediation methods may need to be considered. The final cleaned surface should be pH neutral and free from the cleaning chemicals.

The clean should start high up on the surface, such as a wall, and move downward, including windows, doors (both sides) and the external surfaces of any built-in cabinetry**. Cleaning of the ceiling or associated fixtures like fans or lights is not normally considered necessary unless they are discoloured, the associated wall contamination is high (e.g. above 5 ug/100cm^2 for meth) or illicit drug manufacture in that area could have occurred.**

The normal practice is applying (e.g. spray or foam) the cleaning product in conjunction with agitation and scrubbing and allowing adequate dwell time for the chemicals to work. After rinsing the surfaces down with water, it is normal to wipe the decontaminated surfaces with clean water (e.g. wet disposable cloths) to ensure all residual chemicals have been removed and the surfaces are pH neutral. For any fixed window treatments, light switches or power points (both with power off), hand wiping of external surfaces would also be necessary. Cleaning and decontamination techniques should adopt cross contamination minimisation methods from room to room. This may mean cloths, water, scrubbing pads and other cleaning apparatus are changed prior to commencing decontamination of a new room.

After each cleaning cycle, the surfaces should be allowed to dry. Consideration should be given to taking validation samples at this point, especially for minimally contaminated surfaces, as this may avoid unnecessary extra cleaning cycles. Normally these cycles of cleaning would not need to go beyond three.

8.4.3 Carpets

It is possible that any carpet present may be remediated and retained in low contamination situations, particularly associated with smoke houses.

Disposal, normally still after HEPA vacuuming, would be warranted due to carpet age, low value, **higher level of room contamination, associated illicit drug manufacture**, or because it will be compromised by the cleaning process for the hard structure surfaces.

If a carpet is to be retained, then to the extent practical it should be protected from flooding by the cleaning process on surrounding surfaces. After the adjacent hard surfaces are validated as clean, it should be subject to steam cleaning with detergent and hot water at or above 100°C using a truck mount system.

If in doubt, throw it out!

8.4.4 Ventilation systems

For presumed smoke houses, the ventilation system in the impacted rooms should have all accessible surfaces HEPA vacuumed and solvent wipe cleaned as part of a repeat cycle process associated with adjacent areas, and any filters replaced.

A similar treatment also applies in drug manufacture situations. However, if the system has intra-room ducting then remediation or replacement of that ducting may be necessary if it appears to exceed the trigger value in 6.2.8. Any ducting remediation would normally involve pumping in appropriate cleaning products by ventilation professionals while running the system to ensure that the chemicals move through all the ducting.

8.4.5 Plumbing and drains

The flushing of drains would only normally be warranted in cases where drug manufacture has occurred. If substantial contamination is suspected in these systems (such as in the case of septic systems), it may be necessary to contact the Local Government first.

8.4.6 On-site item cleaning

The main methods of on-site item cleaning consist of wiping down or a combination of HEPA vacuuming and steam cleaning. **Any such cleaning is normally only suitable for some smoke house impacted items.**

Cleaning of goods with hard and largely impermeable surfaces, e.g. metal, glass, plastic or varnished wood, usually consists of thoroughly wiping all surfaces in a systematic manner with a suitable chemical mixture. The mixture might be sugar soap, or the formula used for the normal clean of a room. The final wipe/clean should be with clean water only

Items with fabric surfaces, such as rugs and some furniture are best cleaned by HEPA vacuuming followed by steam cleaning, with one cycle of each normally being adequate.

As they are cleaned the items should be taken back to the original now remediated and validated locations, or, if necessary, taken to another clean space for temporary storage.

8.5 Work area decontamination

After all the on-site impacted goods are cleaned and relocated, the work areas should be subject to the same HEPA vacuuming and repeat solvent clean as outlined above.

8.6 External area remediation

Normally external contamination from illicit drug activities, i.e., garden, is only associated with disposal of waste from manufacture. This residue may sit on and/or seep into the soil. In rarer situations it may affect groundwater.

In many cases such contamination may be dealt with by removal of any bulk surface material plus excavation down to the level of likely chemical penetration. In more complicated or substantial soil or groundwater contamination situations, it may be necessary to seek the guidance of a qualified environmental consultant. The National Guidelines provide further information.

8.7 Follow-up treatment

In most cases it would be expected that the described procedures would be adequate and be confirmed by validation testing, which only needs to be applied to the relevant walls or surfaces.

If any of the validation samples exceeds the relevant HIL of 0.5 µg/100cm^2 for meth, then further remediation may be warranted for contactable surface areas.

For validation tests at 1.5 ug/100cm^2 (meth) or below this might consist of one or more chemical and water rinse cycles, with further validation testing.

After this further work, if a sub-0.5 ug/100cm^2 sample result is not achieved but is close, it is possible that the relevant surfaces can be treated with two coats of a suitable encapsulant paint, normally oil based for painted surfaces or epoxy type lacquers for stained and unpainted timbers. Cross contamination minimisation techniques will need to be adopted to ensure that contamination from 1st coat to 2nd coat does not occur and also that there is no cross contamination from one room to another room. Often this is done by changing rollers, trays and paint for each room.

In some cases, repainting may be included in the scope of work following repairs or expected or resulting damage to walls from the cleaning process.

For residual contamination above 1.5 µg/100cm^2(meth), it may be necessary to resort to more intensive cleaning procedures or other measures to ensure the HIL is achieved in locations where exposure may occur. **For drug manufacture the residual contamination levels may be so high that it would be more practicable to strip the relevant material.**

8.8 Other measures

If a contaminated area is not considered suitable for standard cleaning processes or if they have proven ineffective and residual contamination remains, then other methods may need to

be employed. These include encapsulation, stripping back or stripping out, and in more extreme cases even demolition, such as contamination associated with a **lab fire or explosion**.

For some items such as untreated wooden doors or fixtures, the replacement cost may be less than the cleaning costs, especially given the difficulty of remediating these porous materials.

8.9 Waste disposal

Advice from the Department of Water and Environmental Regulation is that all solid waste, including household goods for disposal (made unusable), should be wrapped or bagged in heavy plastic and disposed of at a Class 2 waste facility, or transfer station for this purpose. A record of this disposal should be retained and made available to the property owner or agent if requested.

Liquid waste from washings may be disposed of through the sewage system, if connected. Otherwise, it may need to be captured, contained and disposed of as per the solid waste.

9 Validation

Final validation clearance should be prior to relocation of any retained items and the re-occupancy of the property.

Validation sampling should be done by a qualified service provider who is independent of the remediation company. There is value in having the initial investigative service provider, who prepared the RAP, also doing the validation testing.

Validation testing is used to demonstrate the effectiveness of the remediation process or to determine if further remediation is necessary. Validation testing is only necessary for illicit drug contamination where a HIL exists, such as for meth, and once there is confidence that a full remediation process, based on this Guide, has been implemented.

For validation purposes, all rooms or spaces where residue above health investigation levels is identified, and remediation conducted should have discrete wipe samples taken. Reliable presumptive tests may be used if justified, e.g. where remediation has only been required for high yielding non-porous surfaces and presumed to be present from drug smoking a reliable presumptive test may be sufficient.

In some cases, it may be sufficient to evaluate the general effectiveness of the remediation by undertaking limited validation sampling in the previously most impacted rooms. The samples might be taken corresponding to the area adjacent to the investigative sample.

If there is suspicion that the remediation process was deficient (e.g. focussed on the investigative sample area rather than evenly done across a whole room) then the validation sample may be done in an area that the tester deems equivalent to the normal validation location.

Laboratory composites may be useful for validation but should not exceed a composite of 5 samples and should be collected for each remediated space or room.

It is suggested that validation samples be taken directly below the investigation sample at about 60 cm above the floor, on the same surface material, being a level readily accessible to toddlers

or infants. Where this location is not possible or the surface type is different, then the validation sample can be adjacent to the investigation sample.

Validation sampling would normally:

- be located at 60 cm above floor level and below the point where any investigative sample had detected contamination and been subject to remediation
- occur after the property has “dried out” (at least two days after cleaning)
- as part of a clean/remediate and validate testing cycle until the affected areas are confirmed to be below the HIL.

For areas where encapsulation has occurred following cleaning then any validation sampling should be completed 7-14 days (based on climactic conditions at the time) after encapsulation to ensure adequate paint curing, and to allow any outward migration of the contaminant and its detection if movement had occurred.

10 Reporting

Reports associated with illicit drug contamination would normally consist of investigation and validation reports. The owner endorsed remediation action plan may be referenced in other reports or a separate remediation and clean up report provided.

Guidance on the composition of a Sampling Plan (6.2.2) and a Remediation Action Plan (7.0) are provided earlier in this Guide.

For management required by a regulatory notice, such as for notified illicit drug production facilities, the report may need to be directed to that authority for review and approval.

Each report should include the following basic elements, specific to the work involved:

- contents page
- property details
- scope of the report
- any service limitations, conditions or exclusions
- activity and report dates
- relevant contextual information, including previous work undertaken, or any redecorating or refurbishment
- personnel who conducted the work, and their qualifications
- applicable regulations or government guidance
- the methodology used (including justification)
- a property graphic of activity locations.
- conclusions
- any relevant photographs, suitably annotated
- sample locations and an indication of the sample position with respect to the remainder of the room
- copies of any previous relevant documentation, such as Police reports
- copies of associated laboratory results.

In addition to the above, the different types of activity should include further elements.

10.1 Sampling report

This may be a detailed investigation and assessment report or a screening report indicating whether contamination is present, or likely to be present at above HILs.

In any case, in addition to the general report elements outlined earlier, the following information specific to the sampling process should be reported:

- table of sample locations, results, including quality control, and interpretation of results in relation to any HIL
- justification for sampling at variance with this Guide
- recommendations on next steps (if necessary) which may include:
  - the need or not for remediation,
  - draft remediation action plan (see Section 7)
  - occupancy arrangements in the interim and during the remediation.

10.2 Decontamination report

In the first instance a remediation action plan should be prepared to help inform the decontamination procedures and validation process. The plan may be attached to other reports. A decontamination report may also be provided separate to the validation report and remediation action plan and it can be finalised when validation sampling confirms the property meets necessary standards.

In addition to the standard report elements, a decontamination report (or section of a report) should include:

- a statement that the remediation company is independent of the testing firm
- details of how and where remediation was undertaken, based on the remediation action plan (RAP)
- any variations from the RAP or this Guide and the justification for these
- information about the disposal of associated waste materials
- information of any further remediation conducted due to the initial validation not being able to confirm HIL compliance
- confirmation of the reinstatement of utilities and return of furniture and effects as necessary.

10.3 Validation report

The validation should be conducted by a qualified person independent of the remediation company, but who may have been involved in the investigative sampling and RAP preparation.

Additional report elements specific to the validation should include those listed below:

- a statement that the validation company is independent of the remediation service provider
- details of the sampling done, based on the validation sampling plan
- any variations from the RAP or this Guide and the justification for these
- table of sample locations, results, including quality control, and interpretation in relation to any HIL or clean-up criteria
- recommendations for further remediation if necessary, plus the associated validation

- issue of a contamination clearance statement, in conjunction with the remediation company, and re-occupancy recommendations.

It may be necessary to have an initial and then a final report if the first round of validation sampling indicates exceedances that prompt further remediation and related validation sampling.

11 In conclusion

This Guide attempts to address new illicit drug contamination management challenges, such as smoke-related contamination, as well as revising the approach taken to clandestine drug laboratory contamination in a practical but protective manner taking account operational and regulatory experience and on the latest scientific research.

It will continue to be revisited and revised as new information or unforeseen issues emerge. To assist in the process and to facilitate its implementation, the DoH welcomes feedback and requests for advice as per the contact points.

12 Useful links

Department of Health Illicit drug contamination

Department of Health Companies qualified for testing and remediating drug residues

Department of Home Affairs - Clandestine Drug Laboratory Remediation Guidelines 2011

National Environment Protection (Assessment of Site Contamination) Measure | National Environment Protection Council (nepc.gov.au)

NIOSH 2011, 'Method 9111 Methamphetamine on Wipes by Liquid Chromatography-Mass Spectrometry-SIM ', NIOSH Manual of Analytical Methods (NMAM), Fifth Edition, CDC, The National Institute for Occupational Safety and Health. www.cdc.gov/niosh/docs/2014-151/pdfs/methods/9111.pdf

13 Bibliography

Commonwealth Department of Home Affairs Clandestine Drug Laboratory Remediation Guidelines 2011

Department of Health 2021 - Methylamphetamine Smoke House Research Report enHealth

Russell, M, *et al*, Forensic Science International 304 (2019) 109971 Assessment of contamination levels in methamphetamine-tested properties in New Zealand

Standards New Zealand 2017 - Testing and decontamination of methamphetamine-contaminated properties: Standards New Zealand

Wright, J. 2019, Australian Voluntary Code of Practice Assessment, remediation and validation: Former clandestine drug laboratories and other methamphetamine contaminated properties

Appendix 1: Illicit drug smoking and manufacture-type residue – key differences

Overview

Property contamination from smoking an illicit drug is far more common than that from its manufacture. Consequently, for a property investigated for illicit drug contamination any positive result should be assumed to result from smoking. Management of "smoke-houses" is simpler and less expensive given the usually much lower surface residue levels found and the absence of other aerosolised contaminants. However, indicators of manufacture should be monitored for and if this activity is suspected or found then it should be managed as such.

The following table indicates the management differences between the two types of contamination.

Feature	Smoke Contamination	Lab-type Contamination
Distribution	Several nodes, often in private or communal areas	Usually most concentrated in a wet utility area; can be together with smoking
Concentration	Usually low-level, meth average 2.7 µg /100cm^2, with rare single readings up to 30 µg/100cm^2	May be multiple 10s to 100s µg/100cm^2 or more, though less so for Nazi-Birch method common in Western Australia
Preparation Information	Not subject to Police/LG notification	Often identified via Police/Local Government notification and direction
Health and Safety	Normally standard limited protective measures	Potentially much greater protection
HILs	Same surface HILs as National Guidelines	Same surface, soil and air HILs as National Guidelines
Sampling	Generally, 1 sample for each space and 1 extra for each further 10 m^2 or substantial portion thereof. See Appendix 4	As per smoke contamination with possible: – garden waste or soil sampling – suspicious stain sampling – VOC sampling – ventilation sampling
Assessment	Manage as smoke impacted if above HIL, no lab indicators, low average meth impact and distribution consistent with smoking	Manage as lab if notified or indicators of lab-like distribution pattern. Check triggers for ventilation ducting remediation
Remediation	- Passive and possibly active ventilation - Good potential to clean removable items and goods - HEPA vacuuming not always necessary - Normally no cleaning of ceiling and its fixtures - Potential for carpets to be cleaned - Standard solvent surface cleaning cycles - More scope for specific surface targeted cleaning	- Use passive ventilation, due to re-aerosolisation potential - Normally dispose of items that are stained, old/low value or have porous surfaces and high contact potential - HEPA vacuuming necessary - Carpets normally not retained - Possible cleaning of ceiling and fixtures - Standard solvent surface clean may require specific chemicals - Possible replacement of some structures - Whole area rather more likely than surface specific cleaning - Includes ventilation accessible surfaces and filters

Feature	Smoke Contamination	Lab-type Contamination
	- This clean includes ventilation system accessible surfaces, and filters - Drains and plumbing not flushed	- Cleaning or replacement of any impacted ventilation ducting - Drains and plumbing flushed - Removal of any garden chemical waste, and excavation, if necessary, of associated soil
Validation	Normally 1 sample per investigative sample positive (60 cm level) Possible use of presumptive test	Normally 1 sample per investigative sample positive (60 cm level) Remediation of ventilation ducting tested against criteria
Reporting	As indicated	As per smoke contamination

Appendix 2: Indicators of a Clandestine Laboratory

The manufacture of drugs requires specific pharmaceutical and chemicals as raw materials, equipment for chemical reactions, and will generate waste material that will require disposal.

Some indicators of drug manufacture, particularly relating to the Nazi/Birch meth method, include:

- smell of ammonia, chlorine or solvents, especially if there is no swimming pool
- improvised alterations to the ventilation systems
- influenza tablet packaging, chemical containers and fertiliser bags in rubbish
- bottles or containers with two liquid layers, or inappropriate chemical containers
- containers with hosing e.g., red jerry cans with plastic hosing connected
- laboratory glassware and equipment
- staining of benches and other surfaces
- gas cylinders with blue stained brass valves
- large numbers of damaged lithium batteries
- soil staining or dead vegetation near drains/taps
- piles of white powder on the ground outside
- presence of small (matchbox sized) plastic bags and/or electronic scales.

Appendix 3: Site entry – example safety analysis checklist

Note that a site inspection may not be necessary even when safe to do so.

Notification received by:

☐ Notification Form ☐ NESR ☐ WAPOL Advice ☐ ChemCentre Advice

☐ Owner/Agent Information ☐ Other (describe) Click or tap here to enter text.

Information provided is adequate

☐ Yes ☐ No ☐ Maybe

If answer is no or maybe then additional information should be sought or a more cautionary approach taken to any site entry.

Hazard Identification and Rating

Presence of the following hazards (tick/comment):

Hazard	Likely	Unlikely	Not known	Comment
Clan lab/smoke house impacts	☐	☐	☐	
Other dangerous chemicals	☐	☐	☐	
Occupants	☐	☐	☐	
Physical/electrical/biological	☐	☐	☐	
Other:Click or tap here to enter text.				

Management Measure Selection

Use of the following management measures (tick/comment):

Measure	Yes	No/ NA	Not known	Comment
Ventilation	☐	☐	☐	
Owner/Agent escort	☐	☐	☐	
WAPOL escort	☐	☐	☐	
Movement plan, including time/contact controls	☐	☐	☐	
PPE	☐	☐	☐	
Other:Click or tap here to enter text.	☐	☐	☐	

Relevant PPE

☐ Respirator ☐ Gloves ☐ Safety Shoes ☐ Hard hat ☐ Eye protection ☐ Overalls

☐ Other Click or tap here to enter text.

Final Review and Decision

Based on data available, hazards identified and management measures is the site safe to visit?

☐ Yes Proceed with inspection but review process as necessary

☐ No Seek advice from line manager and/or expert external agencies

Name:Click or tap here to enter text. Date:Click or tap to enter a date.

Signature:

Appendix 4: Proposed Investigative Sampling and Response Guidance

The accompanying table suggests numbers and types of screening samples for measuring illicit drug surface residue in a residential property, using meth as the example. It should be noted that in each case of a presumptive test positive or laboratory composite equivalent, then contamination quantitation would be necessary. It may also be used as a basis for a detailed assessment.

The main associated sampling principles are provided below.

- Existing or potential future high-use areas in a property are to be included in testing. A high-use area is one easily accessed and where surfaces are regularly contacted by adults or children. This would not include above ceiling or sub-floor crawl spaces.
- To the extent practical, the sampling locations and surface types should be standardised.
- The number of samples for each space is influenced by what is already known or suspected about the site, any available results and the total area. Each additional 10m^2 or substantial part thereof of floor area should prompt a further sample.
- An increased sampling rate is indicated for kitchens, at least by twofold, given the likelihood of possible association with contaminating activity, the high level of occupant time and the potential for frequent surface contact and contact with food.
- The height of any screening sample should be about 180cm above floor level, since this is a reasonably accessible sampling height and residue normally increases on vertical surfaces with respect to floor level.
- Screening samples should focus on certain relevant high yielding and/or likely highly impacted surfaces (such as stained surfaces). High yielding surfaces would include those treated with oil-based paints, varnished timber, or tiles.
- Suitable sampling locations may be backs (into room) of entry doors if normally kept closed (bedrooms, toilets, bathrooms), cabinetry, wardrobe or closet doors, and possibly window frames (if not covered by curtains) or entry door frames suitable for the standard swabbing template.
- Where screening tests indicate residues are likely to be ≥0.5µg/100cm^2, confirmatory, quantitative samples should be taken on walls, being the likely largest accessible surface areas in a space,
- Avoiding sampling areas that may have been recently cleaned, encapsulated or may have been covered during the contaminating activity (e.g., where a picture may have hung on a wall).
- Horizontal surfaces such as floors and windowsills are normally not preferred testing locations since, although prone to residue impacts, their testing may be compromised by any unknown cleaning, or the nature of the surface material (e.g. carpets). Justification should be provided if used.

When in doubt, additional individual, discretionary samples would be appropriate to better inform any remediation.

Where there are mixed positive (≥0.5µg/100cm^2)/negative (<0.5µg/100cm^2) results, further assessment work by the tester may be necessary taking account of the number and magnitude of quantitative sampling results above 0.5 µg/100cm^2.

The table also guides the extent of the remediation, though this will need to take account the magnitude of the results. Any suggested responses need to consider both the impact level and remediation guidance in this Guide and be captured in a Remediation Action Plan.

Table 1 Sampling Guide

Floor Area	**Example floor areas**	**S1 Result**	**S2 Result**	**S3 Result**	**S4 Result**	**Sampling Sequence** (noting positive prompts quantitation)	**Remediation** (of associated space)
< $5m^2$	Toilet, bath, laundry	<0.5µg	NA	NA	NA	Single sample e.g., back of door or wall tile	None
		≥0.5µg	NA	NA	NA		Whole room remediation
$5m^2$ to $10m^2$	Bedroom, study, hall, (excl kitchen)	<0.5µg	NA	NA	NA	Single sample e.g., back of entry door, cabinetry or closet/robe door	None
		≥0.5µg	<0.5µg	<0.5µg	NA	Following positive S1, collect S2 on wall and S3 on other wall if S2 for higher certainty that walls are below HIL.	Remediate the high yielding and horizontal surfaces
		≥0.5µg	≥0.5µg	NA	NA	S1 and S2 sufficient for decision making	Whole room remediation
Kitchen		<0.5µg	<0.5µg			At least two samples e.g., cabinetry and door	None
		<0.5µg	≥0.5µg	<0.5µg	<0.5µg	Either S1 or S2 high yield surface is positive - prompts S3 and S4 on opposite walls	Remediate all high yielding and horizontal surfaces
		≥0.5µg	<0.5µg	<0.5µg	≥0.5µg	Any two positive results sufficient	Whole room remediation
		≥0.5µg	≥0.5µg				
$10m^2$ to $20m^2$	Lounge, master bedroom, dinning, family	<0.5µg	<0.5µg	NA	NA	S1 and S2 well separated, e.g., suitable doors or cabinetry	None
		≥0.5µg	<0.5µg	<0.5µg	NA	One positive S1 or S2 high yield surface prompts S3 on wall adjacent to positive result	Remediate positive high yielding surfaces
		<0.5µg	≥0.5µg	<0.5µg	NA		
		≥0.5µg	<0.5µg	≥0.5µg	NA	Any two positive results sufficient	Whole room remediation
		<0.5µg	≥0.5µg	≥0.5µg	NA		
		≥0.5µg	≥0.5µg	NA	NA		
> $20m^2$	Lounge, family, open space	<0.5µg	<0.5µg	<0.5µg	NA	S1, S2 and S3 well separated, e.g., suitable doors or cabinetry	None
		≥0.5µg	<0.5µg	<0.5µg	<0.5µg	S1 positive prompts S4 on adjacent wall	Remediate high yielding surfaces near S1 area
		≥0.5µg	<0.5µg	<0.5µg	≥0.5µg	S1 and S4 sufficient	Whole room remediation
		≥0.5µg	<0.5µg	≥0.5µg	<0.5µg	Two positives on high yield surfaces prompts further sampling on walls adjacent to highest reading	Remediate all high yielding and horizontal surfaces
		≥0.5µg	≥0.5µg	≥0.5µg		S1, S2 and S3 positives sufficient	Whole room remediation

This document can be made available in alternative formats on request for a person with disability.