Arkansas Department of Environmental Quality
Clandestine Laboratory
Remediation Cleanup Standards

May, 2008

Purpose of these Standards

Pursuant to Arkansas Code, Annotated, §§ 8-7-1401 *et seq,* all clandestine laboratory cleanup contractors certified by the Arkansas Department of Environmental Quality (ADEQ) are required to follow the standards contained in this document.

These standards are to be implemented in cleaning up contamination most frequently associated with the illicit production of controlled substances and do not address every possible situation. If a situation is not described in these standards or clarification is desired, please contact ADEQ for further guidance.

These standards have been compiled utilizing the most current and up to date methods for the clean up of former controlled substance production sites. Standards and methods may change without notification, therefore these standards are subject to change as standards and methods change. Updates to this document will be made as necessary and without formal notification.

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CLEANUP OF CLANDESTINE LABS
1.0 INTRODUCTION

ADEQ has established the following standards as per the provisions of A.C.A. §§ 8-7-1401, (Act 864 of 2007) et seq.

During the methamphetamine manufacturing process, chemical compounds become airborne (volatilized) and settle out, depositing onto walls, ceilings, appliances, floors, carpets, and other typical household items throughout the building's interior. In addition, chemicals used to make the illegal drugs may be spilled during handling or during the manufacturing process. The presence of these chemicals may pose health threats to building occupants and potential liability to property owners.

Chemicals associated with other drug manufacturing methods are not specifically addressed in this document. In addition, as the availability of precursor chemicals is restricted by law enforcement, and as meth manufacturers become more creative, chemicals not listed in Table 1 may be used as alternatives. In all cases, whether dealing with a meth lab or other drug manufacturing, the inventory of chemicals discovered at the site will dictate the precautions taken by the first responders, and the measures necessary for site cleanup. In general, the cleanup procedures discussed in this document should be sufficient to address most chemicals associated with drug lab sites; however, the presence of exotic chemicals should be discussed with the certified clandestine laboratory remediation contractor and/or ADEQ.

This document specifies the cleanup standards that ADEQ has identified for properties affected by the illegal manufacture of methamphetamine and for owners to have their property declared "ready for reoccupation" after being decontaminated. The document describes the methods to remove residual contamination from building interiors and the methods to demonstrate that appropriate cleanup standards have been met via sampling and laboratory analyses. This document provides the standards for the cleanup and evaluation of building interiors that have been contaminated from activities associated with the manufacture of methamphetamine. These standards are to be followed when cleaning up any residual contamination found at clandestine meth lab sites after gross chemical removal and before reoccupation.

2.0 PRELIMINARY SITE ASSESSMENT

Prior to beginning cleanup of a former meth lab, the certified contractor shall conduct a preliminary assessment to determine what chemicals are involved, the manufacturing method, and whether the property is fit or unfit for use as is. There are many meth "recipes" and manufacturing methods. Identifying the chemicals used and the drugs being made at the laboratory will help to determine what kind of chemical sampling may be necessary. ADEQ will collect historical and drug manufacturing information for each clandestine laboratory, this information can be accessed at www.adeq.state.ar.us.

2.1 Methods of Manufacturing

There are three main methods used to manufacture methamphetamine. These are the phosphorus, birch, and amalgam or P2P methods. While variations of these methods can be used, the phosphorus and birch methods are the main cooking methods and are the two primary methods that have been found throughout the United States. The following sections provide a brief overview of the chemicals or

precursors used and wastes generated by each method. Several of the listed chemicals are commonly used in household products but are not generally stored in the quantities required to manufacture illegal drugs.

2.1.1 Phosphorus Method

The phosphorus method is also called the Red P; HI, Hypo Method; or the Red, White, and Blue method. Chemicals commonly associated with this method include hydriodic acid (HI), hydrochloric (muriatic) acid, sulfuric acid, sodium hydroxide (lye), sodium chloride (salt), red phosphorus, hypo phosphorous acid, phosphorous acid, iodine, isopropyl alcohol, ethyl alcohol (ethanol), methyl alcohol (methanol), hydrogen peroxide, naphtha (Coleman fuel), charcoal lighter fluid (mineral spirits and petroleum distillate), acetone, benzene, toluene, ethyl ether (starting fluid), Freon, hydrogen chloride gas, and chloroform. Other chemicals that may be used include acetic acid and methyl ethyl ketone (MEK). Wastes generated during manufacturing include potentially flammable extraction process sludges, phosphine gas, HI, hydrogen chloride gas, phosphoric acid, and yellow or white phosphorus. This method of production is believed to be capable of producing the greatest amount of contamination.

2.1.2 Birch Method

The birch method, also called the Anhydrous Ammonia or Ammonia or method is reportedly as common as the red phosphorus method. This method relies on a supply of anhydrous ammonia that is most commonly found in commercial freezers and agricultural applications. Chemicals associated with this method include anhydrous ammonia, lithium metal, sodium metal, isopropyl alcohol, ethyl alcohol (ethanol), methyl alcohol (methanol), hydrogen chloride gas, hydrochloric (muratic) acid, sulfuric acid, sodium chloride (salt), toluene, naphtha, Freon, ethyl ether, chloroform, and MEK. Wastes generated during manufacturing include potentially flammable extraction process sludges and hydrogen chloride gas.

2.1.3 Amalgam Method

The third method used to produce methamphetamine is known as the amalgam or P2P method. This method uses phenyl2propanone (P2P) and methylamine as precursors. Mercuric chloride, lead acetate, and many other chemicals are used in the synthesis of methamphetamine via the amalgam method. This cooking method can result in lead and mercury contamination, but it is the least common method because of the limited availability of the precursor since it became regulated, the length of time needed to produce the desired drug, low yield, and low concentration of the finished product.

2.2 Hazards Associated with Clandestine Laboratories

Most of the chemicals used to produce illicit methamphetamine fall within three categories: solvents, metals and salts, and corrosives (i.e., strong acids and bases). Each category has similar toxic and physical properties. Risk of injury from chemical exposure may occur depending on the toxic properties of the chemicals, the physical state (i.e., liquid, gas, or solid), the concentration, and the duration and route of exposure. Most people are aware that skin contact with a strong acid or base can result in injury to the body. However, some people may not be aware that exposure to low or moderate levels of some chemicals over a long period may result in absorption by the body, which can lead to other health effects. Absorption of chemicals by the body may occur through one or more of the following routes of exposure:

- Inhalation (respiratory),
- Skin or dermal exposure (via direct contact with the skin),
- Ingestion, and
- Injection (via skin puncture with a needle or other sharp object).

The chemicals classified as solvents or corrosives may exist as gases or liquids and thereby produce the greatest potential for inhalation exposure. Chemical substances in the form of fine powders, or particulates, also pose an inhalation hazard if environmental factors such as air movement keep them suspended in the air.

The final methamphetamine product has considerable potential for adverse effects on the drug user. Toxic properties of the drug include agitation, psychosis, seizures, respiratory arrest, and death. In addition, drugs produced in clandestine laboratories contain numerous contaminants and byproducts that do not have predictable effects on the drug user.

After removal of the illicit laboratory equipment and chemicals by law enforcement (gross chemical removal), residual amounts of some chemical substances may persist on building surfaces and furnishings as a result of spills during methamphetamine production and deposition of volatilized contaminants. Until the residual contamination is completely removed, exposure to it poses a health risk to building occupants where the laboratory was located. Exposure for an extended period of time (months to years to lifetime) is known as chronic exposure. Not much is known regarding the chronic health effects from methamphetamine laboratories. However, there is scientific evidence that the chemicals used to manufacture methamphetamine can cause a variety of health effects, including cancer, brain/nervous system injury, injury to the liver and kidneys, birth defects, and reproductive disorders. Table 1 lists the physical and health hazards posed by some of the chemicals found at illicit meth labs.

The potential for exposure to meth lab residues on surfaces and porous articles (e.g., furnishings) depends on:

- Accessibility of residues and frequency of direct contact: The likely use of a contaminated area is an important factor in estimating frequency of contact. For example, residues in a kitchen or bathroom of a house will likely be contacted more frequently than residues in a garage;
- Ability of volatile residues to become airborne: For example, residues in ventilation systems may be dispersed throughout a residence; and
- Characteristics of the inhabitants or users of the contaminated site: For example, toddlers who crawl on contaminated carpet or floors will have high frequency of contact with toxic residues over a considerable area of skin. These residues may directly irritate the skin and/or be absorbed into the body through the skin. In addition, hand to mouth behavior exhibited by young children will allow chemicals to be ingested into the body. Hand to eye behavior can introduce toxic materials to the eyes. Although all people exhibit these behaviors, infants and toddlers are at greatest risk.

However, if appropriate decontamination procedures are followed, buildings can be reoccupied, because there is no scientific evidence to suggest unacceptable human health risk would occur after thorough decontamination.

2.3 Development of Cleanup Standards

ADEQ established an internal work group to identify methamphetamine manufacturing methods used in Arkansas and to evaluate existing heath-based standards for chemical compounds found at meth labs.

ADEQ determined that there are currently no health-based standards for methamphetamine and that few applicable standards exist for many of the other chemical substances found at meth lab sites. ADEQ also found that a very small percentage of states have adopted detailed regulations for illegal drug laboratory cleanup. The work group identified chemicals used and/or generated during the manufacturing process; researched established risk-based criteria for each chemical and recommended the standards specified in Table 2.

2.4 Required Cleanup Standards

The standards for methamphetamine and volatile organic compounds (VOCs) are applicable to any property where methamphetamine has been manufactured using the phosphorus, birch, or amalgam method. The lead and mercury standards are applicable only to those properties where the amalgam method was used. The cleanup standards specified in Table 2 apply only to meth labs. Standards for other types of drug laboratories, such as those for LSD and ecstasy have not yet been developed. Property owners working on cleanup of non-meth drug manufacturing sites should contact ADEQ for advice regarding sampling and cleaning of those sites.

Property owners should be aware that lead and mercury were commonly added to paints in past years, and in some areas, lead and mercury are present from natural (mineralogical) sources. Background concentrations of mercury and/or lead may result in false positives in excess of the cleanup standards. If a background source is known or suspected, background concentrations must be determined and the applicable cleanup standard would equal background plus the cleanup standard.

2.5 Cleanup Process

Initially, the cleanup process begins after one of the two following scenarios:

1) A drug bust is made and a hazardous materials (HAZMAT) team under contract to law enforcement officials is responsible for the removal of the illegal drug laboratory and associated chemicals (gross chemical removal). At this point, law enforcement personnel are responsible for:

   - securing the property;
   - removing people from the contaminated property;
   - posting a notice of removal;
   - notifying ADEQ; and
   - contacting the property owner.

The property will then be placed on the ADEQ list of contaminated properties and will remain on this list until a certified clandestine laboratory contractor hired by the property owner remediates the property to the standards contained herein.

2) The property owner suspects or finds evidence that a laboratory used for the manufacturing of a controlled substance on his or her property. At this point the property owner is responsible for:

- notifying local law enforcement authorities;
- contacting a certified clandestine laboratory contractor who inspects the property;
- If the presence of a meth lab is confirmed the contractor shall notify ADEQ and the property will be placed on the list of contaminated properties;
- The property will remain on this list until a certified clandestine laboratory contractor remediates the property to the standards contained herein.

Cleanup standards for methamphetamine are deemed applicable to all meth lab sites, no matter which of the three cooking methods was used.

Requirements

The property cannot be reoccupied until pre-cleanup samples indicate that decontamination activities are not warranted or until decontamination activities have been performed and samples have been collected and analyzed to confirm that the cleanup standards in Table 2 have been met. For multi-unit properties, such as hotels, motels, and apartment buildings, occupants must vacate only the hotel/motel room or apartment unit where illegal lab operations or paraphernalia were located, unless the remaining units in that building share a common, forced air ventilation system.

Owners of multi-unit properties that share such a ventilation system shall at a minimum, sample the ductwork and ventilation registers in all units that share the ventilation system for methamphetamine. If the sample results indicate that methamphetamine concentrations are above the required cleanup level in Table 2, the certified clandestine laboratory contractor must decontaminate the ventilation system and conduct additional sampling and testing to determine if other surfaces in those units require decontamination.

Pre-cleanup sampling is not required. Certified clandestine laboratory contractors may decide to collect pre-cleanup samples if they wish to prove that decontamination is not necessary for rooms located away from drug lab activities or when it is believed that pre-sampling will reduce overall decontamination costs.

Requirement

If pre-cleanup samples are collected, the sampling and laboratory testing procedures described in Section A must be utilized.

Much of the decontamination guidance involves removal of potentially contaminated items such as carpets, countertops, sinks, toilets, and bathtubs. In some instances, removal of an item may not be necessary if it can be sufficiently decontaminated and verified with analytical results. The property owner should be aware that it may be more cost effective to remove and dispose of certain furnishings and appliances (e.g., carpet, upholstery, draperies, and stoves/ranges), rather than to try to decontaminate them.

3.0 DECONTAMINATION PROTOCOLS

Decontamination activities pose the risk of potential exposure to hazardous substances and chemicals. Only certified clandestine laboratory contractors shall be used for the investigation and remediation of contaminated properties.

3.1 Safety During Decontamination Activities

Certified contractors shall meet the worker safety requirements of OSHA 29 CFR 1910.120 during all investigation and remediation activities.

3.2 Areas of Contamination

Potential areas of contamination include:

Processing or "cooking" areas: Contamination in these areas may be caused by spills, boilovers, explosions, or by chemical fumes and gases created during the heating and distilling portions of the "cooking" process. Indoor areas affected may include floors, walls, ceilings, used glassware and containers, working surfaces, furniture, carpeting, draperies and other textile products, plumbing fixtures and drains, or heating and air conditioning vents. Outdoor cooking areas could involve picnic tables, camping stoves, or other outdoor areas where cooking could occur.

Disposal areas: Indoor areas include sinks, toilets, bathtubs, plumbing traps and floor drains, vents, vent fans and chimney flues. Outdoor areas may include soil, surface water, groundwater, dumpsters, sewer or storm systems, septic systems and cesspools.

Storage areas: Contamination may be caused by leaks, spills or open containers.

Secondary areas: Locations where contamination has migrated, such as hallways or high traffic areas.

Common areas: Contamination may also be present in multiple dwelling structures and adjacent apartments or rooms, including contamination of floors, walls, ceilings, furniture, carpeting, light fixtures, blinds, draperies and other textile products. Commonly shared ventilation or plumbing systems in hotels and multiple dwellings may also be contaminated.

3.3 Cleanup Procedures for Structures

The removal of lab chemicals and equipment must be conducted by properly trained and equipped law enforcement and/or a HAZMAT cleanup team. After a site has been secured and no longer subject to criminal investigation, only a certified contractor shall be hired to cleanup any remaining contaminated materials. If suspicious containers or lab equipment are found on a property, untrained personnel should leave the area and contact the local fire department or law enforcement agency.

In most situations, cleanup/decontamination will involve one or more of the following measures.

Initial stabilization of the property through removal of chemicals, manufactured drugs, paraphernalia, or any other items needed by law enforcement authorities should occur before the cleanup. This process is called gross chemical removal.

Once gross chemical removal is completed, the property owner is responsible for hiring a certified clandestine laboratory contractor who will remove, dispose of, or clean, any remaining items at the property contaminated with residual contamination.

ADEQ has determined that the following three methods of decontamination are acceptable:

1) The property owner may determine that the most cost effective way to decontaminate the property is to demolish or gut the structure and properly dispose of the demolition debris.

2) The property owner elects to follow ADEQ recommendations regarding the disposal of all porous non-structural materials and/or ventilation system components. In this instance the methamphetamine standard listed in Table 2 will be the only analyte of concern. Surface wipe samples and vacuum samples for methamphetamine shall not exceed a concentration of 0.05 µg /100 cm^2.

3) The property owner desires to salvage or retain porous non-structural materials and/or ventilation system components. In this instance all of these materials shall be decontaminated following the procedures outlined in Section 3.5.1., and Section A, then analyzed for all of the contaminates related to the suspected method of production in Table 2.

Items removed from the property must be disposed of in accordance with applicable rules and regulations. As described above, contaminated areas are assumed to be those areas where chemicals were stored and/or used, cooking areas, and areas where chemicals may have been mixed or disposed of (such as toilets, sinks, bathtubs, and showers). Surfaces in these areas also may exhibit chemical staining or etching (from acids), depending on the method and chemicals used to manufacture the methamphetamine. The identification of heavily contaminated areas should be based on the following:

- Visual observations (staining or etching);
- Reports and/or photographs obtained from law enforcement officials that indicate the location of drug laboratory equipment and chemicals when the drug bust was made; and
- Field screening techniques (optional).

For example, if drug laboratory equipment and chemicals were documented in the kitchen and bathroom of a residence, and visual assessment did not note any chemical staining in any other room, then those two rooms (kitchen and bathroom) would be assumed to be heavily contaminated. The remaining rooms in the house (bedrooms, living room, utility room, and garage) would be assumed to have low level contamination. It is recommended that the hallway between the kitchen and bathroom also be considered a heavily contaminated area because this was likely a high traffic area between the two rooms.

3.3.1 Gross Chemical Removal

Initial stabilization of the property through removal of chemicals, manufactured drugs, paraphernalia, or any other items needed by law enforcement authorities should occur before the cleanup.

3.3.2 Airing Out

When solvents and other chemicals that may have soaked into the walls or furnishings are slowly volatilizing indoors, proper ventilation may safely reduce contamination and decrease odors. Venting may be necessary for several days after the gross chemical removal and before cleanup begins to allow volatile compounds to be dispersed, and good ventilation should be maintained during all phases of the cleanup. Care must be taken to ensure that vented contaminants are exhausted to the outdoors and not to the air intakes of adjacent structures. Windows should be opened and exhaust fans set up to circulate air out of the structure. During this time, the property will remain off limits to all people except the certified contractor, law enforcement, fire department, property owner, or ADEQ personnel.

3.3.3 Removal

Cleanup and decontamination will be completed by a certified clandestine laboratory contractor. Residual powders and liquids will be tested to determine their corrosivity, toxicity, and flammability. In cases where acids or bases are known to be sources of contamination, the potential for harmful effects may be reduced or removed through neutralization. Acids may be neutralized with solutions of sodium bicarbonate (baking soda), and bases may be neutralized by using weakly acidic solutions of vinegar or acetic acid in water. Solids should be scooped up and packaged for disposal. Liquids can be absorbed with clay (kitty litter or floor sweep) or other nonreactive material and packaged for disposal. If the property is on a septic tank system, the tank liquid will be tested to determine if it contains meth lab related chemicals. If meth lab chemicals are present, the contents of the tank will be disposed of as either a solid or hazardous waste, based on the results of analysis. Analysis of the septic tank contents will be based on chemicals determined to be part of the lab site chemical inventory (developed as part of the preliminary assessment).

3.3.4 Porous Materials

Porous non-structural materials, such as carpeting, drapes, furnishings, clothing, etc., can absorb vapors and may collect dust and powder from the chemicals involved in the manufacturing process. ADEQ recommends that these materials be removed and properly disposed of, however if the property owner decides to salvage or retain these items they should consult with their contractor to determine how best to decontaminate them. Prior to transporting waste to a landfill, the facility will be notified that the waste stream is from a former meth lab so that the landfill can take the proper measure to handle it appropriately.

3.3.5 Non-porous / Semi-porous Materials

Some non-porous and semi-porous surfaces (such as floors, counters, tiles, walls, ceilings, sinks, bathtubs, toilets, etc.) can hold contamination from the meth cooking process, especially in those areas where the cooking and preparation were performed. Cleaning these areas is very important as people may come in frequent contact with these surfaces through skin contact, food preparation, etc. If a surface has visible contamination or staining, complete removal and replacement of that surface section is recommended. This could include removal and replacement of wallboard, floor coverings and counters. If this is not possible, intensive cleaning with a detergent water solution or steam cleaning is recommended. Used wash water will be tested and disposed of properly. Analysis will be based on chemicals determined to be part of the lab site chemical inventory (developed as part of the preliminary assessment). With approval from the local publicly owned treatment works (POTW), it may be possible to discharge the wash water into the sanitary sewer.

3.3.6 Ventilation System

Ventilation systems tend to collect fumes and dust and redistribute them throughout a structure. The vents, ductwork, filters and even the walls and ceilings near ventilation ducts can become contaminated. ADEQ recommends that all ductwork, air filters, and vents be removed and properly disposed of, however if the property owner decides to salvage or retain these items they should consult with their contractor to decide how best to decontaminate them.

In motels, apartments, row houses or other multiple family dwellings, a ventilation system may serve more than one unit or structure. These connections must be considered when evaluating cleanup and testing procedures. Samples will be taken from adjacent or connected areas/rooms/units, working outward from the lab site until samples show low levels or no contamination.

3.3.7 Plumbing

Waste products generated during meth manufacturing are often dumped down sinks, drains and toilets. These waste products can collect in drains, traps and septic tanks, and can give off fumes. If staining is noted around sinks, toilets or tubs, or if a strong chemical odor is coming from household plumbing, the local POTW will be advised that chemicals associated with meth production might have been disposed of down the sanitary sewer. Do not conduct any invasive measures to eliminate the odors. If air reactive chemicals (such as phosphorus or lithium metal) are present, exposure of these chemicals to air may result in ignition. The plumbing system should be flushed with generous amounts of water to reduce the concentration of residual chemicals. If contamination of a septic tank or leach field is suspected, contact the Arkansas Department of Health to determine if the local individual sewage disposal system regulations address such an issue.

3.4 Pre-decontamination Procedures

Certified clandestine laboratory contractors conducting a meth lab cleanup shall perform a preliminary assessment (PA) of the site before the decontamination activities. The PA should include:

Collection and review of all available documents associated with the former illegal meth lab site to determine the cooking method used and the potential contaminates that may be encountered at the site.

1) Determination whether the site is safe for entry. Any reports of potential structural problems, fire, or explosion should be brought to the attention of a qualified engineer before entrance to the site.
2) Completion of a walkthrough examination of the site. It is recommended that pictures and drawings of the site be collected and maintained for the property owner's record. If quantities of unknown substances that may have been overlooked by law enforcement officials are found during the walkthrough examination, the seizing law enforcement agency shall be notified. Removal and identification of unknown chemicals or substances should be conducted by a HAZMAT team before any additional cleanup activity.

Once the PA is completed, the contractor shall develop a cleanup plan for the site. The following items shall be addressed in the cleanup plan:

1) Location and legal description of the meth lab.

2) A summary of materials removed from the site during the drug bust.
3) Contractor information.
4) A list of items to be removed from the premises.
5) A description of cleanup methods to be used.
6) A waste disposal plan.
7) A list of all required permits, such as disposal and burn permits.
8) Security provisions for the site.
9) A site safety plan that meets the requirements of OSHA 29 CFR 1910.120.

3.5 Removal of Furnishings and Household Contents

The disposition of the contents of a structure where a meth lab operated will depend on many factors, including an assessment of the degree of contamination, legal status of the resident or owner, and value of the items to the owner (e.g., precious heirlooms or sentimental items). The property owner should be aware that it might be more cost effective to discard certain items rather than decontaminate them. The following list provides some guidance regarding the disposition of site furnishings and household contents.

- **Food:** All food shall be discarded, including pet food;
- **Small and large appliances:** Stoves/ranges used to cook methamphetamine shall be discarded because it is too difficult to ensure that contamination is removed from all crevices. Large appliances, such as refrigerators, dishwashers, washers, and dryers, with no evidence of visual contamination can be decontaminated by washing exterior and interior surfaces with a hot water detergent solution and rinsing with clean water. The wash and rinse procedures shall be performed at least three times using clean fluids. Small appliances that are used for food preparation, such as toasters, microwave ovens, and coffee makers, shall be discarded;
- **Clothing, linens, and other fabric items:** Fabrics with obvious chemical staining or contamination shall be discarded. Washable fabrics, including bed linens, area rugs, and soft toys, shall be machine washed at least three times with a solution of hot water and detergent. Fabrics that cannot be washed with detergent and water shall be dry cleaned using a liquid solvent dry cleaning solution in a dry cleaning machine for at least 15 minutes see requirement below;
- **Dishes, flatware, and other hard (nonporous) household goods:** Any item that shows evidence of being used for the cooking process (e.g., staining and/or etching) shall be discarded. Washable items, including ceramics, hard plastics, metals, and glass, shall be washed and rinsed with hot water and detergent at least three times;
- **Household items made of wood and wood like composites:** The disposition of these generally porous items depends on the degree of contamination, surface finish (e.g., varnish, polyurethane), value, and ability of the item to be washed with a solution of hot water and detergent. If considered cleanable, these items should be washed at least three times and rinsed;
- **Upholstered furniture:** Disposal of these items is recommended, however if the property owner decides to salvage or retain these items they should consult with their contractor to decide how best to decontaminate them.
- **Household books and paper items:** Paper goods are extremely porous. Any paper items near the area of a known laboratory shall be discarded. Paper goods stored in filing cabinets, closed bookcases, or cupboards in rooms where wipe samples show low levels of contamination may be

salvageable.

Requirement

If any materials are removed from the property for cleaning (e.g., curtains, rugs), they shall be HEPA vacuumed before being removed from the site and the cleaning facility shall be notified in writing by the property owner or their contractor that the materials being cleaned are from a former illegal drug laboratory. The vacuum cleaner will be of commercial grade and equipped with a HEPA dust collection system.

3.5.1 Decontamination Procedure Requirements

Doors or other openings to areas assumed to have low level contamination will be cordoned off with plastic sheeting where possible to reduce the spread of contamination during decontamination of heavily contaminated areas.

Once the rooms have been emptied of the porous non-structural components and household items, the following procedures shall be used to decontaminate the building interior. These procedures generally require the use of a cleaning solution of hot water and detergent, unless otherwise specified.

Requirement

All areas of the premises shall be vacuumed, including the ceilings. Before vacuuming, all closets and cabinets will be opened, and cabinet drawers will be removed. The vacuum cleaner will be of commercial grade and equipped with a HEPA dust collection system. The following paragraphs provide decontamination guidelines for specific items such as kitchen countertops and bathroom fixtures. However, because each meth lab cleanup will be different, guidelines for general categories of building materials are also provided. In essence, all contaminated surfaces within a former meth lab shall be removed and replaced, or cleaned during decontamination activities.

- **Bathroom fixtures:** Remove and replace visibly contaminated (stained or etched) sinks, bathtubs, toilets, and shower stalls. Remove and replace all accessible plumbing traps. If a plumbing trap cannot be removed because of inaccessibility, then it shall be flushed with hot water and detergent solution for at least 5 minutes. All nonporous surfaces, such as bathtubs, toilets, mirrors, windows, tile flooring, and sinks that are not removed shall be cleaned. If cleaned, these surfaces shall be washed with a solution of hot water and detergent and then rinsed with hot water. This shall be done at least two additional times with clean wash and rinse water.
- **Kitchen/bathroom countertops:** Remove and replace all porous countertops and food preparation surfaces. Porous materials include wood and granite. Manmade solid surface countertops, such as Corian→, may be sanded to remove any contaminated material, washed with a solution of hot water and detergent, and rinsed with hot water. This shall be done at least two additional times with clean wash and rinse water.
- **Walls:** Walls in the immediate vicinity of the cooking area may be stained or may have absorbed some of the chemicals used in the manufacture of methamphetamine. Wall materials, such as

sheet rock, with visible staining or discoloration shall be removed and replaced. All other walls shall be washed with a solution of hot water and detergent, and rinsed with hot water. This will be done at least two additional times with clean wash and rinse water on each wall surface, unless the wall area is sampled and the sample results indicate that the cleanup standard has been met. It is recommended that all baseboards and window and ceiling trim in contaminated areas be removed and replaced. Walls with no evidence of staining shall be cleaned in accordance with the guidelines below for porous and nonporous surfaces, depending on the building material type.

- **Ventilation Systems:** ADEQ recommends that all ventilation ductwork, filters, and vents be removed and properly disposed of. Air handling units, heaters, air conditioners, and associated equipment may be decontaminated but requires specialized equipment. If the property owner decides to salvage or retain these items they should consult with their contractor to determine how best to decontaminate them.
- **Carpeting:** ADEQ recommends the removal and disposal of all carpeting, however if the property owner decides to salvage or retain these items they should consult with their contractor to determine how best to decontaminate them. Carpet must be misted with water before removal to prevent dust particles from becoming airborne. This is a protection measure for cleanup personnel. Once the carpeting and pad are removed, the nonporous sub floor shall be vacuumed with a HEPA vacuum.
- **Fans and Vents:** All floor and window fans shall be removed and disposed of. Exhaust vents such as those used above ranges/stoves shall be removed and replaced.
- **Ceilings:** Ceiling tiles, drop ceiling panels, and other types of ceilings (e.g., painted sheetrock, spray on textured ceilings) in the immediate vicinity of the cooking area shall be removed and replaced. Note: Some ceiling tiles and panels may contain asbestos, especially in older buildings. If the presence of asbestos is suspected, additional testing and safety precautions may be warranted to prevent exposure during the removal and cleaning process. Ceilings with no evidence of staining shall be cleaned in accordance with the guidelines below for porous and nonporous surfaces, depending on the building material type:

  Nonporous (i.e., smooth painted ceilings) shall be washed with a solution of hot water and detergent, and rinsed with hot water. This shall be done at least two additional times with clean wash and rinse water.

  Porous ceilings in areas of the premises not associated with the cooking process shall be vacuumed with a commercial HEPA equipped vacuum cleaner.
- **Windows/Glass:** All windows and glass surfaces shall be cleaned with a commercial glass cleaning compound at least three times, using clean solution each time.
- **Storage cabinets and closets:** The interior and exterior of all storage cabinets and closets shall be washed with a solution of detergent and hot water. This procedure will be done at least two additional times with clean wash and rinse water.
- **Electrical fixtures:** Electrical outlet covers, wall switch plate covers, and light fixtures shall be removed, washed in a solution of hot water and detergent, and rinsed with hot water. This will be done at least two additional times with clean wash and rinse water. Note: Remember to cut the

power when decontaminating or washing electrical fixtures and switches.

- **Remaining non-porous items, such as ceramic tile flooring, doors, vinyl or metal mini-blinds, and door and window hardware:** Remove and replace all visibly stained items. Items with no evidence of staining or etching shall be cleaned by HEPA vacuuming, then washed with a solution of hot water and detergent, and rinsed with hot water. The items shall be washed at least two additional times with clean wash and rinse water.
- **Remaining porous materials such as painted drywall, flooring (e.g., linoleum), ceiling tiles, and spray on wall or ceiling surfaces:** Remove and replace all visibly stained items. Note: Some ceiling and flooring tiles and sheet flooring products may contain asbestos, especially in older buildings. If the presence of asbestos is suspected, additional testing and safety precautions may be warranted to prevent exposure during the removal and cleaning process. Items with no evidence of staining shall be cleaned by HEPA vacuuming and detergent water cleaning. Hot water and detergent shall be injected into the porous materials under pressure to agitate and loosen any contamination. The water and detergent solution shall then be extracted from the porous material by a wet vacuum.

Requirement

If any materials are removed from the property for cleaning, they shall be thoroughly HEPA vacuumed prior to removal, and placed in plastic bags or visqueen for transport to the cleaning facility. The cleaning facility shall be notified in writing by the certified contractor that the materials being cleaned are from a former illegal drug laboratory.

- **Septic systems:** If a septic system is present, it shall be pumped out and the effluent discharged to the local publicly owned treatment works.

3.6 Waste Management

Decontamination activities will generate both solid waste (e.g., trash) and liquid waste or wastewater (e.g., used decontamination fluids). All wastes must be disposed of in accordance with applicable state and federal laws and regulations. In general, wastewater may be discharged to a sanitary sewer or septic system unless it contains concentrated decanted or spilled chemicals. Any waste materials determined to meet the regulatory definition of hazardous waste must be disposed of in accordance with applicable state and federal laws and regulations for those types of wastes. In some instances, small quantities of hazardous waste may be disposed of via the local household hazardous waste program with little cost to the property owner. The determination for final disposition of waste may require testing, and will be determined by the certified contractor.

3.7 Documentation of Decontamination Activities

It is recommended that the property owner maintain documentation of decontamination activities. Suggested documentation includes the following:

- Pre and Post Decontamination Documentation;

- Photographs (before, during, and after cleanup);
- Receipts from disposal companies;
- Receipts for rented equipment or cleaning supplies; and
- Notes or reports from contractors.

3.8 Post Cleanup Assessment for Structures

Cleanup and sampling of former meth labs will be conducted by a certified clandestine laboratory contractor (see Sections 4.0 and 4.1). Decisions regarding the sampling plan can be made based on the preliminary assessment information, chemicals used and duration of lab operation, the apparent extent and severity of contamination, and professional judgment. Variations of the cleanup and testing process may include:

- Sampling alone may be necessary when precleaning samples indicate low levels or no contamination in some areas.
- In contaminated areas, cleanup may be carried out without previous sampling if post cleanup sampling will be conducted.

After complete cleanup, small amounts of residual chemicals may remain. Post cleanup sampling shall be conducted after the residual cleanup. This assessment shall include sampling for meth residues on surfaces using a wipe sample. The procedure for collecting a wipe sample is included as Sections A and C. This procedure is in accordance with the OSHA Technical Manual (http://www.osha.gov/dts/osta/otm/otm_ii/otm_ii_2.html).

If the amalgam (P2P) method was used, testing must also include airborne mercury and lead, and surface sampling for lead. Risk based exposure limits for lead and mercury are provided in Table 2. Bear in mind that the possibility of obtaining false positives for lead and mercury exists because these materials used to be commonly added to paints.

If there is sufficient concern about residual vapor concentrations after cleanup, indoor air may be tested to determine the concentrations of specific chemicals. Sampling and testing shall be performed using recognized standards and written procedures designed to ensure accuracy, reproducibility, and relevance to onsite contamination.

Written documentation showing that the cleanup has been completed must be submitted to ADEQ. The final report should summarize the work performed; present data collected during the post cleanup assessment, and be signed by the certified contractor. ADEQ will review the report and determine whether the property is suitable for reoccupancy.

3.9 Reoccupancy of Structures

In order to determine acceptable risk-based concentrations for meth lab related chemicals, the work

group reviewed human exposure reference values for chemicals commonly associated with meth production. Based on this review and an evaluation of the cleanup standards currently in use by other states, ADEQ has established exposure limits for residual meth lab related chemicals, as shown in Table 2.

The methamphetamine cleanup level is based on what is believed to be conservative and protective, while at the same time achievable by cleanup contractors.

Testing for a limited suite of chemicals may be appropriate for "piece labs" that produce only precursors or do limited production steps, since meth may not be present at these labs. If the P2P method was used, testing should also include lead and mercury. Other compounds may also be tested for, as deemed necessary based on the preliminary assessment.

3.10 Cleanup Procedures for Soil, Groundwater and Surface Water

If areas of potential outdoor contamination are identified or suspected, further investigation of outdoor contamination will be necessary. Small areas of outdoor contamination may be dealt with by removal or treatment of contaminated soils or water (i.e., small areas of ponded water). Contaminated soil or water removed from the site must be characterized to determine if it contains a characteristic or listed hazardous waste, and must be disposed at an appropriately licensed solid or hazardous waste disposal facility. Analysis must be based on the lab site chemical inventory and manufacturing method used. If large areas of soil, surface water or groundwater contamination are present, characterization and cleanup of these areas will be conducted by a professional environmental contractor, in consultation with the certified contractor and ADEQ. In general, characterization and remediation of soil, surface water or groundwater impacts would include the following:

3.10.1 Source Identification

It is important to tie site characterization to the chemical storage and waste disposal information gathered on the site to ensure that assessment efforts look for potential contaminants in the places they are likely to be. This type of information can be gathered from observations made by law enforcement or HAZMAT personnel, or by conducting a site tour to note the property's condition, looking for evidence of contamination such as stained soil or stressed (dead or dying) vegetation.

It is important to evaluate both natural features and manmade structures, such as drainage systems, local topography, utilities, surface water bodies, easements and locations of buildings, because these features can influence the migration of contaminants and restrict access to portions of the site during remedial efforts. This information is used in conjunction with information regarding the subsurface characteristics at the site to evaluate contaminant migration pathways.

The amount of information that may need to be gathered will depend largely upon the characteristics of the release and the local hydrogeology. Relatively immobile contaminants (such as metals) that may

have been released onto the ground surface will require considerably less subsurface data collection than a release involving relatively mobile contaminants (such as solvents). The subsurface characteristics will need to be defined to the degree necessary to provide a clear understanding of potential migration pathways for the purpose of defining the extent of contamination.

3.10.2 Remediation

The results of the site characterization effort and the desired cleanup goals will define the level of remediation that may be required. Outdoor contamination may be dealt with using one or more of the following measures:

- Waste removal;
- Site controls (e.g., fencing);
- Drainage control;
- Monitoring; and
- Removal or treatment of contaminated soil or water (i.e., surface water or groundwater).

3.10.3 Soil Cleanup Levels

ADEQ established soil cleanup levels for a limited number of chemical compounds associated with meth labs, as provided in Table 2. ADEQ should be contacted for compounds that do not have an established cleanup level.

3.10.4 Water Cleanup Levels

Cleanup standards for ground and surface waters may be found by contacting the ADEQ Water Division.

SECTION A

SAMPLING AND ANALYTICAL METHODS

All samples must be collected using professionally accepted equipment and methods. These are described in EPA site investigation guidance documents. All samples must be prepared and analyzed in strict accordance with the methods described in EPA's "Test Methods for Evaluating Solid Waste (SW-846)" or other method approved by ADEQ. The SW-846 Manual is available online at http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm.

SAMPLE COLLECTION OVERVIEW

Only certified clandestine laboratory remediation contractors may conduct sampling and testing.

The analytical results obtained via sampling and laboratory analyses will be used to determine the presence and concentration of methamphetamine, VOCs, and lead and mercury (if necessary) remaining on building surfaces or in air after decontamination activities.

Requirement

The analytical results must show that residual contaminant levels (if any) are below the cleanup standards specified in Table 2.

TYPES OF SAMPLES

Types of sample collection include, but are not limited to:

- Wipe samples from nonporous surfaces, including walls, fixtures, floors, furniture, and appliances, for methamphetamine and, if necessary, lead;
- Vacuum samples from carpets, upholstered furniture, and other surfaces not amenable to wipe sampling; and
- Air samples from within the residence for VOCs and, if necessary, mercury.

If it is suspected or if there is evidence that chemicals or wastes were dumped outside a residence, the certified contractor shall notify ADEQ for additional guidance. Dumping of chemicals outside a residence may affect groundwater, drinking water supplies, surface water, and soil.

BASIC SAMPLING PROTOCOLS

Requirement: All sample collection shall be performed using standards and protocols to ensure:

1) Accuracy, which is the ability to produce similar results with repeated sampling.
2) Proper wipe, vacuum, or air sampling techniques to collect a representative sample of the area being sampled.
3) Proper care and prudent action to avoid cross contamination during sampling (e.g., changing gloves between sample locations).
4) Proper storage and preservation of samples until they are transported to the laboratory for analysis. Samples shall be stored and preserved based on the recommendations of the contracted analytical laboratory.

In addition, the certified contractor shall keep the samples in a secure (i.e., locked) location until they are shipped or delivered to the laboratory. Holding time requirements shall be based on the recommendations of the contracted analytical laboratory.

All samples collected, transported, stored, and analyzed shall be accompanied by a chain of custody. This form may serve as if the property owner or contracted professional desires to maintain it for the purposes of legal defensibility or other perceived liability.

METHAMPHETAMINE SAMPLING AND TESTING

Methamphetamine sampling and testing will be conducted using the wipe and/or vacuum sampling protocols adapted from United States Environmental Protection Agency (EPA) Publication EPA 747R-95001, Residential Sampling for Lead Protocols for Dust and Soil Sampling (EPA 1995), as they apply to this guidance.

To summarize, wipe samples are achieved using reagent grade, methanol wetted, 100 cm^2 cotton gauze or filter paper wipes from various 100 cm^2 surfaces, wiping the surfaces with the wetted wipe in the manner prescribed by the protocols.

Certified clandestine laboratory contractors may chose between collecting wipes samples from up to four different locations and combining these wipes into one composite sample or collecting and analyzing discrete samples from each of the same locations described for the composite samples. Collecting and analyzing discreet samples provides specific information about the locations that may need additional decontamination if the sample result is above the standard. On the other hand, if a composite sample result is above the standard, all locations that were wiped and composited into one sample will require additional decontamination. The potential for additional decontamination must be weighed against the cost benefit of the reduction in lab costs for analysis of multiple discrete samples. If the certified contractor decides to utilize the composite sample option, they are advised to ensure that the sample results provided from the lab are corrected to the units of $\mu g/100\ cm^2$.

The following paragraphs describe the number and location of final confirmation samples that will require laboratory analyses.

Room Sample: In each room within the property known or suspected to be contaminated with methamphetamine, four 10 centimeter by 10 centimeter areas (a total of 400 cm^2) shall be wipe sampled from the following locations: the non-porous floor, the ceiling, and two walls. This includes all rooms at the property. These four wipes may be combined or composited into one sample for every room.

Kitchen Sample: In addition to the room sample, if there is a kitchen on the property, four additional 10 centimeter by 10 centimeter areas (a total of 400 cm^2) shall be wipe sampled from a combination of the countertop, sink, stove top, and floor in front of the stove top. If the stove or cook top has been removed as recommended, a sample shall be collected from the vent hood or lacking a vent hood from a cabinet in the immediate vicinity of the stoves location. The four wipes may be combined or composited into one kitchen sample.

Bathroom Fixture Sample: In addition to the room sample, if there is a bathroom on the property, four additional 10 centimeter by 10 centimeter areas (a total of 400 cm^2) shall be wipe sampled from a combination of the countertop, sink, toilet, and shower/bathtub. These four wipes may be combined or composited into one bathroom fixture sample.

Vacuum samples may be more appropriate for some of the samples required above if porous materials

are present on ceilings and floors (i.e., acoustical ceilings and carpeting). Carpets and other coarse surfaces that have been decontaminated shall be sampled using a vacuum sampling system, as described in Section D. Vacuum samples may be collected utilizing an air sampling pump, which draws the sample through a collection nozzle and filter sock from coarse 100 cm^2 surfaces such as carpets or coarse textured walls or ceilings.

Ventilation Sample: In addition to the samples discussed above, four 10 centimeter by 10 centimeter areas (a total of 400 cm^2) shall be wipe sampled at different locations in the ventilation system. These four wipes may be combined or composited into one sample.

Appliance Sample: If there are any cleaned appliances on the property (e.g., refrigerator), one 10 centimeter by 10 centimeter area (100 cm^2) shall be wipe sampled from the exposed portion of each appliance. If multiple appliances are present, up to four wipe may be combined or composited into one appliance sample (for a total of 400 cm^2 per sample).

After sampling, the single or multiple wipes, or single or multiple vacuum filter socks, shall be placed in a new clean sample jar (wipes) or conical sample tube (vacuum filter socks) and sealed with a Teflon lined lid. Vacuum samples cannot be combined with wipe samples for laboratory analysis.

The sample containers shall be properly labeled with at least the site name or project identification number, date, time, actual sample location, and total size of the sample area. The sample containers shall be placed in individual, sealed Ziploc® bags and appropriately preserved and stored until delivered to an approved analytical laboratory.

VOLATILE ORGANIC COMPOUND SAMPLING AND TESTING

Requirements

A certified contractor can establish conformance to the VOC cleanup standard (1 ppm total VOCs) by conducting a VOC survey using a calibrated PID or FID or any other equivalent sampler.

New carpets, paints, and some cleaners may yield positive results on PID and FID instruments as well. For this reason VOC sampling (by either method) must occur after decontamination (i.e., cleaning) activities are completed and prior to the use of any paints, or the addition of new carpeting, flooring or adhesives to the property. After decontamination and before commencement of VOC sampling activities, venting of the residence for 24 to 48 hours may be necessary in order to "air out" any remaining detergent or other decontamination agents.

Prior to VOC sampling, the property shall remain closed (doors, windows), without ventilation, for at least 8 hours and returned to a temperature of 70^oF in order that the property may come to equilibrium for testing.

PID/FID VOC SURVEY

Confirmation VOC survey utilizing a properly calibrated PID or FID by a qualified sampler may be used. A properly operating PID or FID will yield near zero ppm readings in clean air, and will yield substantial evidence (20, 50, or 100+ ppm) in the presence of solvents.

Requirements

When using this method, the PID or FID must be calibrated using a low concentration calibration gas (0 to 10 ppm range). Calibration of the PID and/or FID must be verified before and after the survey.

Testing shall occur in each room of the affected property. Initially, directed survey of areas of possible storage, use, spillage, or disposal associated with the former drug lab should be conducted using the PID or FID in each location for at least 1 minute (VOC vapors may not be detected by the PID or FID otherwise) and the highest reading obtained should be recorded. Any positive reading above natural background may indicate the presence of solvent contaminated materials requiring further removal and/or decontamination.

In the event positive readings are encountered, the source of VOCs shall be investigated using the instrument as a guide. Some low (i.e. slightly greater than 1 ppm) background VOCs may exist at the property. These may be due to resins in building materials, oil based paints, or external factors such as spilled fuel adjacent to a storage tank, poor septic drainage, tree pollen or other background source not associated with the former drug lab.

In the event "background" VOCs are encountered, the certified contractor will substantiate background concentration with detailed documentation. A site specific VOC standard equaling 1 ppm plus background may be achieved.

After completing the directed survey, a room by room survey shall occur to confirm that the areas away from documented lab activities are below the cleanup standard. The initial survey should occur in the center of the room and the PID or FID is held 3 feet above the floor (the height of a small child's breathing zone). The highest reading observed during this time is recorded.

Next a survey along the walls of the room shall occur, with readings achieved every five feet. Again the highest reading achieved during this period is recorded.

All inaccessible drains or plumbing traps not replaced during decontamination shall be tested for VOCs by holding the testing equipment probe in the plumbing pipe above the trap, and the highest reading should be recorded.

Upon completion of the VOC survey, the certified contractor shall prepare a brief report, inclusive of all findings and calibration data.

LEAD SAMPLING AND TESTING

If there is clear evidence that lead and/or chemicals containing lead were used in the manufacture of methamphetamine, lead sampling and testing is required. This is conducted in a manner similar to methamphetamine wipe sampling; however, the cotton gauze wipe should be wetted with reagent grade nitric acid rather than with methanol. Sample areas for lead shall not be co-located with sample areas for methamphetamine (i.e., the same area shall not be wiped with both methamphetamine and lead wipes). The sample areas for lead shall be adjacent to the sample areas for methamphetamine.

MERCURY SAMPLING AND TESTING

Requirements

If there is clear evidence that mercury was used in the manufacture of methamphetamine at the clandestine drug lab, mercury sampling and testing is required and shall be conducted using National Institute of Occupational Safety and Health (NIOSH) Method 6009. This method involves the use of a sample pump drawing an air sample through a sorbent tube that is subsequently analyzed by a laboratory.

Final mercury confirmation sampling and analyses shall be performed in the center of the room that contained the former illegal methamphetamine laboratory. Although not required, it is recommended that additional samples be collected from all rooms considered to be heavily contaminated. Sampling and analyses shall be performed in accordance with the protocols prescribed by NIOSH Method 6009.

NUMBER OF SAMPLES TO BE COLLECTED AND ANALYZED

Because each meth lab site is different, the number of samples to be collected will vary based on the number of rooms within the building, whether fixtures and appliances were decontaminated for reuse, and other factors.

Requirement

Each sample sent to the laboratory shall be assigned a unique identification number (i.e., sample ID). The locations of the sub samples should be documented in a field notebook.

If the amalgam/P2P method were documented, then additional samples would be collected for lead and mercury analysis.

SAMPLE CONTAINERS AND HOLDING REQUIREMENTS

All samples shall be stored preserved, and the appropriate holding times followed for each analyzed media and method.

SECTION B

DOCUMENTATION OF SAMPLING ACTIVITIES

The property owner or owner's agent should collect and maintain documentation of sampling activities. Photographs of sampling areas and sample jars are also recommended.

SAMPLE TESTING

Collected samples must be submitted to a laboratory certified by ADEQ for testing (i.e., analysis).

The certified contractor must indicate the total sample area size when requesting analysis of composite wipe samples for methamphetamine or lead. The analytical laboratory can report sample results into the units specified by the cleanup standards upon request.

The certified contractor must use the sample analysis request form included below when requesting analysis of confirmation samples. It specifies that sample results will be reported in units that match the cleanup standards (e.g., µg/100 cm^2 for methamphetamine).

CLEANUP DOCUMENTATION

FORMER CLANDESTINE LABORATORY DECONTAMINATION REPORT

Property Owner:

Legal Description of Property:

1) Decontamination of Heavily Contaminated Areas From the room(s) or location of the meth lab operations, remove all porous and visibly stained materials; may include, but is not limited to: carpets, sheetrock, countertops, appliances, and drain traps. Maintain a photographic record. List materials and items removed:

Identify final disposition of materials and items removed:

2) Decontamination of Surfaces and Appliances All remaining surfaces and appliances in the room, or the location of the meth lab, require thorough cleaning with hot water and detergent hot water, or the use of a wet-vac or steam cleaner. Maintain a photographic record. List surfaces and items, and methods of decontamination:

Identify final disposition of fluids generated by decontamination activities:

I certify that the above information is true and complete, to the best of my knowledge and belief:

Signed: Date:

Printed Name: Phone:

Certified Contractor:

FORMER CLANDESTINE LABORATORY METHAMPHETAMINE SAMPLING REPORT

SITE LOCATION:

Methamphetamine Wipe-Sampling Summary

Room/Appliance [1]	Composite Locations [2]	Sample ID [3]

Notes:

1) Kitchen, bathroom, bedrooms, toilet, tub, refrigerator, range/stove, etc.
2) Four or fewer sub-samples from a single room, or multiple fixtures or appliances may be composited into one single sample for analysis.
3) The sample ID must be distinct from any other sample ID.
4) The sample label must include the date and time of sampling, sample ID, and total sampling area. The same information must be included on the chain of custody form.

FORMER CLANDESTINE LABORATORY VOC SAMPLING REPORT

SITE LOCATION:

VOC Sampling Summary -Summa® Canister Method

Location (Room)	Time Start	End Time	End Flow Rate (liters per minute)

FORMER CLANDESTINE LABORATORY LEAD SAMPLING REPORT

SITE LOCATION:

Lead Wipe-Sampling Summary

Room/Appliance [1]	Composite Locations [2]	Sample ID [3]

Notes:

1) Kitchen, bathroom, bedrooms, toilet, tub, refrigerator, range/stove, etc.
2) Four or fewer sub-samples from a single room, or multiple fixtures or appliances may be composited into one single sample for analysis.
3) The sample ID must be distinct from any other sample ID.
4) The sample label must include the date and time of sampling, sample ID, and total sampling area. The same information must be included on the chain of custody form.

FORMER CLANDESTINE LABORATORY MERCURY SAMPLING REPORT

SITE LOCATION:

Mercury -Sampling Summary

Location (Room)	Time Start	Time End	Flow Rate Scrubber Volume (liters per minute)

SECTION C

WIPE-SAMPLING PROTOCOLS

Protocol for Collection of Wipe Samples Methamphetamine and/or Lead

Introduction: This protocol provides for the collection of settled dust samples from hard, relatively smooth, non-porous surfaces using wipe methods. The protocol is not applicable for the collection of settled dust samples from highly textured surfaces, such as brickwork and rough concrete, and soft fibrous surfaces, such as upholstery and carpeting. The protocol is capable of producing samples for either methamphetamine or lead (separate and distinct wipe samples and subsequent analyses), with quantitative results in loading terms (micrograms per 100 square centimeters).

Required Sampling Equipment and Supplies:

- Masking Tape: Used for holding down sampling templates and marking sampling locations.
- Sample Collection Containers: Certified containers as recommended by the contracted analytical laboratory.
- Sampling Templates: A sampling template is typically a disposable cardboard cutout of a 100 cm^2 inside area, or a 100 cm^2 area demarcated directly on the wall or other surface with masking tape. Reusable plastic, aluminum, or other materials may be used. Usually, this will be a 10 centimeter by 10 centimeter square. A variety of shapes (such as square, rectangle, square U shaped, rectangle U shaped, and L) may be used in variable field situations. All templates must have accurately known inside dimensions. Templates should be thin (less than 1/8inch) and capable of lying flat on a flat surface.
- Measuring Tape or Ruler: Steel or plastic with divisions to 1 centimeter.
- Wipes: Sterile cotton gauze 10 centimeters by 10 centimeters (Johnson &Johnson®, or equivalent).
- Methanol: Reagent grade. Used for wetting methamphetamine sample wipes.
- 10% Nitric Acid: Reagent grade. Used for wetting lead sample wipes. Nitric acid is needed only when the amalgam/P2P methamphetamine method of cooking has been identified.

General Supplies:

- Field Notebooks: Bound with individually numbered pages.
- Indelible Ink Marker: Black ink.
- Ink Pens: Black ink.
- Packaging: Bubble wrap for sample, Ziploc® bags for bubble wrapped samples, clear strapping tape for sealing shipping coolers.
- Plastic Bags: Trash bags with ties.
- Nitrile or Latex Gloves: Powderless (gloves with powder should not be used).
- Shipping Cooler(s): With appropriate preservation media as recommended by the contracted analytical laboratory.
- Optional Forms: Sampling report form and chain of custody form.
- Custody Seals: Used to seal custody of individual samples for purposes of legal defensibility.

Sampling Procedure
Following is a summary or overview of this procedure

STEP 1. Select a sampling location. Don a clean pair of gloves.

STEP 2. Mark the sampling location using a template or masking tape that equals 100 cm^2. Photograph the sample location. Discard gloves.

STEP 3. Don a clean pair of gloves. Remove gauze wipe from packaging, and wet gauze wipe lightly with either methanol (for methamphetamine sample) or 10% nitric acid (for lead sample). Squeeze off any excess wetting agent. The wipe should not drip during wipe sampling. Fold wipe in half.

STEP 4. Perform first wiping side to side in an "S" motion, covering entire sample area. Apply pressure to the fingertips during wiping.

STEP 5. Turn wipe over. Perform second wiping top to bottom in an "S" motion, covering entire sampling area. Apply pressure to the fingertips during wiping.

STEP 6. Place wipe in sample container.

STEP 7. Label the sample container with the date, time collected, sample identification, and other pertinent information (total sample size).

STEP 8. Discard gloves in a trash bag.

Please note that it is important to change gloves as instructed because contamination may be transferred from one sample location to another potentially clean sample location. If a composite sample is being collected, repeat Steps 1 through 6 using a new wipe, a new template, and clean gloves. The wipes for the composite sample are placed in a single sample jar and the total sample area is noted on the sample label.

SECTION D

VACUUM SAMPLING PROTOCOLS

Protocol for Collection of Vacuum Samples Methamphetamine and/or Lead

Introduction: This protocol provides for the collection of samples from surfaces using vacuum methods. The protocol is suitable for the collection of samples from hard and highly textured surfaces, such as brickwork and rough concrete, and soft, fibrous surfaces, such as upholstery and carpeting. This protocol can be used to produce samples for methamphetamine or lead.

Procedures presented in this protocol are intended to provide a method for collection of samples that cannot be conducted using wipe collection methods. In addition, these procedures are written to utilize

equipment that is readily available and in common use for other environmental sampling applications.

Because of the flow dynamics inherent in the vacuum method, results for vacuum samples are not likely to reflect the total contaminants contained within the sampling area. This protocol generally will have a collection bias toward smaller, less dense, particulates. However, the protocol, if performed as written, will generate particulate data that will be consistent and comparable between operators performing the method. Collecting samples by vacuuming offers the advantages for sampling dusty, nonporous surfaces and porous surfaces such as carpeting, ceiling tiles, ventilation systems filters, and cloth seats. Vacuum samples must be collected using only high efficiency particulate air (HEPA) vacuum samplers. Vacuum samples are obtained using a Dust Collection Filter Sock to the inlet nozzle of a HEPA vacuum sampler. Conventional home or industrial vacuum cleaners should not be used for sample collection because these vacuum cleaners can further disperse contamination if filtration is insufficient. HEPA vacuum samples are not appropriate in sample locations where insufficient dust mass is collected.

Equipment and Supplies

Required Sampling Equipment

- Vacuum Sampler: HEPA vacuum sampling system configured with a filter sock.
- Filter Sock: 0.8micrometer, filter sock.
- Masking Tape: Used for holding down sampling templates and marking sampling locations.
- Sampling Templates: 100 square centimeter (cm^2) inside area, reusable aluminum or plastic, or disposable cardboard or plastic template. A variety of shapes (such as square, rectangle, square U shaped, rectangle U shaped, and L) may be used for variable field situations. All templates must have accurately known inside dimensions. Templates should be thin (less than 1/8 inch), and be capable of lying flat on a flat surface. Sample Collection Container: 50 or 100 milliliter conical or centrifuge tube with Teflon lined lid.

Secondary Sample Collection Container: Ziploc® plastic bags for holding and transporting the filter cassettes, or socks in sampling containers.
Measuring Tape or Ruler: Steel or plastic divisions to at least 1 centimeter.

General Supplies

- Field Notebooks: Bound with individually numbered pages.
- Indelible Ink Marker: Black ink.
- Ink Pens: Black ink.
- Packaging: Bubble wrap for sample, Ziploc® bags for bubble wrapped samples, clear strapping tape for sealing shipping coolers.
- Plastic Bags: Trash bags with ties.
- Nitrile or Latex Gloves: Powderless (gloves with powder should not be used).
- Shipping Cooler(s): With appropriate preservation media as recommended by the contracted analytical laboratory.
- Forms: Sampling report form and chain of custody form.
- Custody Seals: Used to seal custody of individual samples if desired for legal defensibility.

Sampling Procedure Vacuum Sampling Procedure

The following procedure assumes that the air sampling pump has been warmed up, and sufficient flow (<2.5 L/min) verified by the manufacturer, vendor, or via a flow meter or other calibration device.

Following is a summary or overview of this procedure:

STEP 1. Select a sampling location. Don a clean pair of gloves.

STEP 2. Mark the sampling location using a template or masking tape that equals 100 cm^2. Photograph the sample location. Discard gloves.

STEP 3. Don a clean pair of gloves. Prepare the vacuum and filter (sock or cartridge, depending on the type of vacuum sampler).

STEP 4. Perform the first vacuuming side to side in an "S" motion, covering the entire sample area.

STEP 5. Perform the second vacuuming top to bottom in an "S" motion, covering the entire sample area.

STEP 6. Place cartridge in certified containers as recommended by the contracted analytical laboratory.

STEP 7.Label the sample container with the date, time collected, sample identification, and other pertinent information (total sample size).

STEP 8. Discard gloves in a trash bag. Please note that it is important to change gloves as instructed because contamination may be transferred from one sample location to another potentially clean sample location. If a composite sample is being collected, repeat Steps 1 through 8 using a new filter sock, a new template, and clean gloves. The socks for the composite sample are placed in a single sample container and the total sample area is noted on the sample label.

SECTION E

VOLATILE ORGANIC COMPOUND SAMPLING PROTOCOLS

Protocol for Collection of Air Samples Using a Summa® Canister for Volatile Organic Compounds

The following sampling method has been excerpted and revised from the United States Environmental Protection Agency's (EPA's) Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) (January 1999, EPA/625/R96/010b). The method, referred to as TO15, involves the use of a Summa® vacuum canister, which when opened (by simply turning a valve) draws an air sample into the canister for subsequent analysis by the laboratory. While there are other methods to test for volatile organic compounds (VOCs) in air, TO15 provides lower detection limits and models real conditions more effectively than other methods. In addition, sampling is a simple process, and the physical integrity of the canister prevents damage to, or loss of, the sample.
VOCs exist in many household items, including nail polish remover, some cleaning compounds, oil based paints, glues and adhesives, and new carpeting. For this reason, VOC sampling should occur:

- After decontamination is complete,
- Before any new carpeting or painting activities, and
- After the residence has been well ventilated (see Section A).

The residence is not ventilated during sampling. The residence should be at room temperature, typically 68° to 74° Fahrenheit. All exterior doors and windows should be closed. The canister is placed in the middle of the room where the former methamphetamine laboratory existed and placed on a table, rather than on the floor. The exact height is not critical, but is intended to approximate the breathing zone of a young child (approximately 3 feet). In order to obtain a representative sample, a composite or time weighted average sample is collected. This means that the canister is fitted with a special flow device (e.g., critical orifice), which regulates the flow of the air sample into the canister over a period of several (8 to 12) hours. When the canister is ordered from the laboratory, it must be specified that a time weighted average sample will be obtained. There should be a threaded cap, which must be removed from the orifice before sampling. Next, the sampler notes the time and pressure (on the canister gauge) and opens the canister valve. The building, room, and canister are left undisturbed for several hours during the day, or possibly overnight. Afterward, the sampler returns, notes the time and pressure, closes the canister, and replaces the cap. Refer to Section A for additional sampling procedures.

An identification tag is attached to the canister. At minimum, the canister serial number, sample identification, location, date, and time of sampling (hour and minutes) are recorded on the tag. The canister is routinely transported back to the analytical laboratory in a canister shipping case.

SECTION F

MERCURY SAMPLING PROTOCOLS

Protocol for Collection of Air Samples for Mercury Vapors Introduction: This protocol provides for the collection of air samples for mercury analysis.

Equipment and Supplies
Mercury vapor sampling requires

1) Air monitoring pump and sampling line.
2) Flow calibration device.
3) Sorbent sampling tube.

This equipment is of technical specification. The pump and calibration device can be leased, and sorbent tubes and sampling lines purchased from a vendor.

Required Sampling Equipment
One possible sampling equipment set includes:

- Sampling pump.
- Calibration kit.
- Sorbent tubes.

General Supplies

- Field Notebooks: Bound with individually numbered pages.
- Indelible Ink Marker: Black ink.
- Ink Pens: Black ink.
- Packaging: Bubble wrap for sample, Ziploc® bags for bubble wrapped samples, clear strapping tape for sealing shipping coolers.
- Plastic Bags: Trash bags with ties.
- Nitrile or Latex Gloves: Powderless (gloves with powder should not be used).
- Shipping Cooler(s): With appropriate preservation media as recommended by the contracted analytical laboratory.
- Optional Forms: Sampling report form and chain-of-custody form.
- Custody Seals: Used to seal custody of individual samples for purposes of legal defensibility. Sampling Procedure Following is a step-by-step summary of this procedure:

STEP 1. Prepare sampling location on table in middle of room.

STEP 2. Don a clean pair of sampling gloves. Break ends of sorbent tube immediately before sampling.

STEP 3. Connect air monitoring pump to sample line, sorbent tube, and calibration device. Turn pump and calibration device on, and adjust flow device to 0.2 liter per minute. Record the time and exact flow.

STEP 4. Remove flow calibration device, and allow pump with sorbent tube to run for 6 to 8 hours.

STEP 5. Don a clean pair of sampling gloves. Record the exact time, and turn off the pump. Remove sorbent tube, and replace caps. Package tube in Ziploc® bag and bubble wrap in cooler with appropriate preservation media as recommended by the contracted analytical laboratory. On the laboratory request form, note the total number of minutes sampled.

STEP 6. At least one blank tube is also sent to the laboratory. For the blank, quickly break off the ends of the tube, and cap immediately. Package tube in Ziploc® bag and bubble wrap in cooler with appropriate preservation media as recommended by the contracted analytical laboratory. Name the blank other room, and on the sample request form, provide a "dummy" number of minutes.

SECTION G

CONTACTS FOR ADDITIONAL INFORMATION

To report a known or suspected meth lab, contact your local law enforcement agency and drug task force.

For general questions regarding meth lab cleanup, call the ADEQ Controlled Substance Contaminated Property Cleanup Program Support Manager. This agency should also be called if you suspect that there may be potential environmental contamination from a meth lab (i.e., disposal to surface waters or dumped on the ground).

suspected disposal down the sanitary sewer should be reported to the local wastewater treatment authority. The public works department or other city offices can assist in determining how to contact the local wastewater treatment authority.

For questions regarding health effects of meth lab related chemicals or byproducts, please contact the Arkansas Department of Health.

SECTION H

REFERENCES

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NIOSH Pocket Guide to Chemical Hazards. Department of Health and Human Services, Centers for
Property Owner Guidelines for Cleaning Up Former Methamphetamine Labs. Kansas Department of Health and Environment, Meth Lab Cleanup Program. July 1, 2000.
The Basic Standards for Ground Water, 41.0 (5 CCR 100241). Colorado Department of Public Health and Environment, Water Quality Control Division.

SECTION I

GLOSSARY

Acute Exposure: Having a rapid onset and following a short but severe course. A single, nonrepetitive exposure for not more than 8 hrs

Air Lances: Long, thin, high pressure air piping, hose, and nozzle used to snake through ventilation systems to physically dislodge particulate contamination from ductwork.

Air Registers: Grated inlet or outlets to heating, ventilation, and air conditioning inlets and outlets.

Background Concentration: The amount of a substance that may be present throughout an area due to environmental conditions.

Chronic Exposure: Relating to an illness or medical condition that is characterized by long duration or frequent recurrence. Exposure to a low concentration of a chemical substance for an extended period of time, days to years.

Clandestine Drug Laboratory: Illegal drug laboratory.

Composite Sampling: The collection of samples taken from different locations that are combined and analyzed as a single sample. A methamphetamine or lead composite sample may consist of up to four sample locations (4x100 cm^2).

Corrosives: Acids such as muratic or hydrochloric (or other) acids, and bases such as Red Devil® lye or caustic soda.

Decontamination: The process of removing contamination.

Deposition: The process by which contamination in the vapor or particulate form (such as methamphetamine and lead) deposits on walls and surfaces.

Disposition: The location where wastes are finally deposited (e.g., as in a landfill, down the drain, or HAZMAT removals).

Ready for Reoccupation: Decontaminated residences that meet the cleanup criteria of this guidance are considered "Ready for Reoccupation" and may be reinhabited after being delisted as an illegal drug - manufacturing site.

Flame Ionization Detector: A field screening device used to detect VOCs in air, referred to as FID.

Gross Chemical Removal: Removal of illegal laboratory equipment, paraphernalia, chemicals, etc. by law enforcement and HAZMAT contractor.

HAZMAT: HAZardous MATerials.

HAZWOPER: Hazardous Waste Operations and Emergency Response training and certification specified by 29 CFR 1910.120.

Contaminated Area: Areas where concentrations of contaminants are likely, such as the rooms where chemicals were used or cooked, or areas where chemicals were spilled.

HEPA: High efficiency particulate air. HEPA systems refer to filtration devices, including vacuum cleaners, designed to remove particulates from the air.

Illicit: Illegal.

Metals and Salts: Refers to chemical substances containing toxic metals, including lead and mercury.

Methamphetamine: A controlled substance, sometimes illegally manufactured for illicit use by clandestine laboratories.

Non-porous: A hard, smooth surface that does not have "pores" that would allow for the accumulation of contamination.

OSHA: Occupational Safety and Health Administration.

PPE: Personal Protective Equipment such as chemical protective suits (Tyvek®, Saranex®), gloves, boots, and respirators.

Photoionization Detector: A field screening device used to detect VOCs in air, referred to as a PID.

Porous: A surface that has "pores," not necessarily visible to the naked eye, that are susceptible to the accumulation of contamination and/or liquids.

Precursor: A chemical used to create methamphetamine.

Qualified: A term that identifies a person as knowledgeable and experienced in a given field of technical expertise. For nonprofessional occupations (decontamination contractor), the qualified contractor will possess industry related certifications (HAZWOPER or HAZMAT), equipment manufacturer training, and at least four years of experience in the general trade. Qualified contractors should have verifiable references.

Remediate: To clean up. A term used to describe the act of decontaminating a contaminated site.

Residual Contamination: Contamination at a site due to spilling of chemicals and/or deposition of chemicals through the air upon walls, floors, ceiling, ventilation, appliances, and other surfaces.

Sorbent Tube: Residual contamination can have high concentrations due to deposition of chemicals via air movement. For mercury analysis, the sorbent tube is a glass tube containing activated carbon, which traps mercury from the air sample drawn by the sample pump. The sorbent tube is then analyzed for mercury content.

Summa® Canister TO15: Vacuum cylinders used to obtain VOC samples.

Toxic Organics15: The method for using a Summa® canister to collect a VOC sample and subsequent laboratory analysis.

Wetting Agent: Methanol for methamphetamine wipe samples and 10% nitric acid for lead wipe samples. The gauze wipes are wetted with these chemicals before the wipe sample is collected.

Wipe Sample: Use of a wetted gauze wipe to sample walls, countertops, appliances, and other suitable

surfaces.

Volatilized: Process by which liquid or solid chemicals are made airborne.

VOC's: Volatile organic compounds. These compounds include solvents used in the manufacture of methamphetamine.

Table 1

Chemical Exposure Limits for Select Chemicals
Associated with Clandestine Methamphetamine Labs

Chemical	Occupational Exposure Limits	Health Effects
Acetone CAS: 67-64-1 DOT: 1090, 127	OSHA: 1000 ppm (2400 mg/m3) TWA NIOSH: 250 ppm (590 mg/m3) TWA IDLH: 2500 ppm ATSDR MRL: 13 ppm (inhalation)	vapor irritant to eyes and mucous membranes, skin irritant
Acetic Acid CAS: 64-19-17 DOT: 2790, 153 (10-80% acid) 2789, 132 (>80%)	OSHA: 10 ppm (25 mg/m3) TWA NIOSH: 10 ppm TWA, 15 ppm (37 mg/m3) STEL IDLH: 50 ppm	irritate or burn skin, eyes and respiratory system, hyperkeratosis, pharyngeal edema, chronic bronchitis
Alcohol (Isopropyl) CAS: 67-63-0 DOT: 1219, 129	OSHA: 400 ppm (980 mg/m3) TWA NIOSH: 400 ppm TWA, 500 ppm (1225 mg/m3) STEL IDLH: 500 ppm	vapor irritant to eyes and respiratory system, high concentrations may be anesthetic
Aluminum CAS: DOT:	OSHA: 15 mg/m3 (particulates) NIOSH: 10 mg/m3	irritation to eye, skin and respiratory system
Ammonia (Anhydrous) CAS: 7664-41-7 DOT: 1005, 125 (anhydrous) 2672, 154 (10-35%) 2073, 125 (35-50%) 1005, 125 (>50%)	OSHA: 50 ppm (35 mg/m3) TWA NIOSH: 25 ppm (18 mg/m3) TWA, 35 ppm (27 mg/m3) STEL IDLH: 300 ppm ATSDR MRL: 0.3 ppm (inhalation)	irritate or burn skin, eyes and respiratory system; contact with liquid causes caustic burns and frostbite; death due to inflammation of larynx
Benzene CAS: 71-43-2 DOT: 1114, 130	OSHA: 1 ppm (3 mg/m3) TWA, 5 ppm (16 mg/m3) STEL NIOSH: 0.1 ppm TWA, 1 ppm STEL IDLH: 500 ppm ATSDR MRL: 0.004 ppm (inhalation)	eye and respiratory irritant, dizziness, excitation, flushing, weakness, headache, loss of breath, chest constriction, nausea, coma, death
Chloroform CAS: 67-66-3 DOT 1888, 151	OSHA: 50 ppm (240 mg/kg3) Ceiling NIOSH: 10ppm (49 mg/kg3) Ceiling, 2ppm (9.78 mg/kg3) STEL IDLH: 500 ppm ATSDR MRL: 0.02 ppm (inhalation)	headache, dizziness, nausea, drunkenness, narcosis

Ether (Ethyl Ether) CAS: 60-29-7 DOT: 1155, 127	OSHA: 400 ppm (1200 mg/m3) TWA NIOSH: 400 ppm TWA (under evaluation) IDLH: 1900 ppm (10% LEL)	eye and skin irritant, headache, nausea, loss of consciousness
Ethanol (Ethyl Alcohol) CAS: 64-17-5 DOT: 1170, 127	OSHA: 1000 ppm (1900 mg/kg3) TWA NIOSH: 1000 ppm TWA IDLH: 3300 ppm (10% LEL) CAS: 141-78-6	eye nose and throat irritant, headache, drowsiness, liquid causes intoxication
Ethyl Acetate DOT: 1173, 129	OSHA: 400 ppm (1400 mg/m3) TWA NIOSH: 400 ppm TWA IDLH: 2000 ppm (10% LEL)	eye and respiratory irritant, headache, dizziness, nausea, weakness, loss of consciousness
Formic Acid CAS: 64-18-6 DOT: 1779, 153	OSHA: 5 ppm (9 mg/kg3) TWA NIOSH: 5 ppm	vapor: nausea, vomiting; liquid: skin and eye burns
Freon CAS: varies (several types) DOT: varies	OSHA: varies NIOSH: varies	vapor: greater than 10% in air may cause narcosis; liquid may cause frostbite.
Hydriodic Acid (Hydrogen Iodide) CAS: 10034-85-2 DOT: 1787, 154	OSHA: NA NIOSH: NA	skin, nose and throat irritant; skin and eye burns; coughing, shortness of breath
Hydrochloric (Muriatic) Acid (Hydrogen Chloride Gas) CAS: 7647-01-0 DOT: 1789, 157 (solution) 1050, 125 (anhydrous)	OSHA: 5 ppm (7 mg/m3) Ceiling NIOSH: 5 ppm Ceiling IDLH: 50 ppm	skin, nose and throat irritant; skin and eye burns
Hydrogen Peroxide CAS: 7722-84-1 DOT: 2984, 146 (8-20%) 2014, 140 (20-60%) 2015, 143 (>60%)	OSHA: 1ppm (1.4mg/kg3) TWA NIOSH: 1 ppm IDLH: 75 ppm	skin, nose and throat irritant; skin and eye burns
Hypophosphorus Acid CAS: 6303-21-5 DOT: 154, 3264	OSHA: NA NIOSH: NA	severe skin, eye, and respiratory tract irritation or burns
Iodine (Crystals) CAS: 7553-56-2 DOT: NA	OSHA: 0.1 ppm (1 mg/kg3) Ceiling NIOSH: 0.1 ppm IDLH: 2 ppm	eye, nose and skin irritant; lacrimation, chest tightness, skin burns, rash, cutaneous hypersensitivity

Lithium Metal CAS: 7439-93-2 DOT: 1415, 138	OSHA: NA NIOSH: NA	severe skin and eye irritation or burns, lung irritant, coughing, shortness of breath
Methanol (Methyl Alcohol) CAS: 67-56-1 DOT: 1230, 131	OSHA: 200 (260 mg/kg3)ppm NIOSH: 200 ppm, 250 ppm (325 mg/m3) STEL IDLH: 6,000 ppm	eye, nose and throat irritant, dizziness, headache, difficulty breathing, liver damage, teratogen
Methylamine CAS: 74-89-5 DOT: 1061, 118 (anhydrous) 1235, 132 (aqueous)	OSHA: 10 ppm (12 mg/m3) TWA NIOSH: IDLH: 100 ppm	seizures, eye, nose and throat irritant, skin and eye burns
Methyl Ethyl Ketone (2-Butanone) CAS: 78-93-3 DOT: 1193, 127; 1232, 127	OSHA: 200 ppm (590 mg/m3) NIOSH: 200 ppm (590 mg/m3) ST 300 ppm (885 mg/m3) Other: 3000 ppm	Irritation of eyes, skin, nose; headache; dizziness; vomiting; dermatitis
Methylene Chloride CAS: 75-09-02 DOT: 1593, 160	OSHA: 25 ppm (87 mg/m3) TWA, 125 ppm (435 mg/m3) STEL NIOSH: under revision IDLH: 2300 ppm ATSDR MRL: 0.3 ppm (inhalation)	eye, nose and throat irritant, pulmonary edema, headache, nausea, fatigue
Naphtha (petroleum distillates) CAS: 8002-05-9 DOT: 1255, 128	OSHA: 500 ppm (2000 mg/m3) TWA NIOSH: 350 mg/m3 TWA, 1800 mg/m3 Ceiling IDLH: 1100 ppm	Irritation of eyes, nose, throat; dizziness, drowsiness, headache, nausea; dry cracked skin; chemical pneumonitis
Phosphine Gas CAS: 7803-51-2 DOT: 2199, 119	OSHA: 0.3 ppm (0.4 mg/m3) TWA NIOSH: 0.3 ppm TWA, 1 ppm (1 mg/m3) STEL IDLH: 50 ppm	Nausea, vomiting, abdominal pain, diarrhea; thirst; chest tightness, dyspnea (breathing difficulty); muscle pain, chills; stupor or syncope; pulmonary edema; liquid: frostbite
Phosphoric Acid CAS: 7664-38-2 DOT: 1805, 154	OSHA: 1 mg/m3 TWA NIOSH: 1 mg/m3 TWA, 3 mg/m3 STEL IDLH: 1000 mg/m3	eyes, skin and upper respiratory system irritant; eye, skin, burns; dermatitis
Phosphorus Pentachloride CAS: 10026-13-8 DOT: 1806, 137	OSHA: 1mg/m3 TWA NIOSH: 1 mg/m3 TWA IDLH: 70 mg/m3	high irritant to skin, eyes & mucous membrane

Sodium Dichromate CAS: 10588-01-9 DOT: 1479, 140	OSHA: 0.01 mg/m3 TWA (as CrO_3) NIOSH: 0.001 mg/m3 TWA (as Cr) IDLH: 15 mg/m3 (as Cr^{+6})	respiratory irritation from inhalation of dust or mist; ingestion: vomiting, diarrhea; irritant to eyes and skin
Sodium Hydroxide (Lye, Caustic Soda) CAS: 1310-73-2 DOT: 1823, 154 (dry, solid) 1824, 154 (solution)	OSHA: 2 mg/m3 TWA NIOSH: 2 mg/m3 Ceiling IDLH: 10 mg/m3	irritation or damage to respiratory system; irritation or burn to skin; contact causes severe damage to eyes
Sodium Metal CAS: 7440-23-5 DOT: 1428, 138	OSHA: NA NIOSH: NA	highly caustic to skin, forms caustic solution in water, strong oxidizer
Sulfuric Acid CAS: 7664-93-9 DOT: 1830, 137 1831, 137 (fuming) 1832, 137 (spent)	OSHA: 1mg/m3 TWA, 3 mg/m3 STEL NIOSH: 1 mg/m3 TWA IDLH: 15mg/m3	skin, nose and throat irritant; skin and eye burns; pulmonary edema, bronchitis; emphysema; conjunctivitis
Toluene CAS: 108-88-3 DOT: 1294, 130	OSHA: 200ppm TWA, 300ppm Ceiling, 500ppm 10- min max NIOSH: 100ppm (375 mg/m3) TWA, 150 ppm (560 mg/m3) STEL ATSDR MRL: 0.4 ppm (inhalation)	eye, nose and throat irritant, weakness, exhaustion, euphoria, dizziness, headache; dilated pupils, anxiety, muscle fatigue, insomnia

Table 2

Cleanup Standards

Risk Based Screening Levels for use in a Clandestine Methamphetamine Laboratory

Chemical Name	Concentration of Chemical on Surface (µg/100 cm^2)		Soil Screening Levels (mg/kg)		Ambient Air Screening Levels (mg/m^3)		Volatile (Y/N)	Source
a,a'-dimethyldiphenylethylamine	3.62E-01	NC	6.20E+00	NC		NC	N	7
a-benzyl-N-methylphenethylamine	5.00E-02	NC	N/A	NC		NC	N	16
a-benzylphenethylamine	3.62E-01	NC	6.20E+00	NC		NC	N	7
Acetaldehyde*	3.26E+00	C	1.09E+01	C	2.51E-03	C	Y	1
Acetic Acid	5.00E-02	NC	N/A	NC		NC	N	16
Acetic Anhydride	3.62E+03	NC	6.20E+04	NC		NC	N	16
Acetone	1.86E+03	NC	1.42E+04	NC	1.49E+00	NC	Y	1
Allyl benzene	5.00E-02	NC	N/A	NC		NC	N	16
Aluminum	2.06E+03	NC	7.73E+04	NC	2.36E-03	NC	N	1
Aluminum Hydroxides	2.06E+03	NC	7.73E+04	NC	2.36E-03	NC	N	1
Ammonia*	4.49E+01	NC	1.49E+02	NC	4.73E-02	NC	N	1
Amphetamine	3.62E-01	NC	6.20E+00	NC		NC	N	2
Barium Sulfate	2.01E+02	NC	1.56E+04	NC	3.31E-01	NC	N	1
Benzene*	4.57E-01	C	6.56E-01	C	7.15E-04	C	Y	1
Benzyl Chloride*	1.48E-01	C	8.92E-01	C	1.14E-04	C	Y	1
Benzyl Cyanide	7.41E+00	NC	8.96E+01	NC		NC	N	1
Benzyl methyl ketone benzylimine	5.00E-02	NC	N/A	NC		NC	N	16
Butylamine	4.22E+03	NC	7.23E+04	NC		NC	N	3
Calcium chloride*	3.49E+04	NC	3.49E+05	NC	2.80E+01	NC	N	3
Chloroform	1.57E+01	C	2.45E-01	C	2.40E-04	C	Y	1
Chloropseudoephedrine	1.86E+03	NC	1.86E+04	NC		NC	N	16
Copper Chloride	2.15E+01	NC	2.80E+02	NC		NC	N	1
Cyanotrihydroborate	5.00E-02	NC	N/A	NC		NC	N	16
Di-(1-phenylisopropyl) amine	5.00E-02	NC	N/A	NC		NC	N	6
Di-(1-phenylisopropylmethylamine)	5.00E-02	NC	N/A	NC		NC	N	16
Dibenzyl ketone	5.00E-02	NC	N/A	NC		NC	N	16
Diethylmalonate	1.03E+05	NC	1.03E+06	NC		NC	N	9
Dimethylformamide	1.91E+02	NC	1.19E+03	NC	1.42E-02	NC	N	10
Ephedrine	1.86E+03	NC	1.86E+04	NC		NC	N	11
Ethanol*	5.90E+04	NC	5.90E+05	NC	4.72E+01	NC	Y	2

Ethyl Acetate	1.86E+03	NC	1.87E+04	NC	1.49E+00	NC	Y	1
Ethyl ether	4.13E+02	NC	1.84E+03	NC	3.31E-01	NC	Y	1
Formic acid	2.40E+03	NC	1.00E+05	NC	1.42E-03	NC	N	1
Freon	4.90E+02	NC	1.78E+03	NC	3.31E-01	NC	Y	1
Hydrochloric Acid*	1.23E+01	NC	2.98E+01	NC	9.45E-03	NC	N	1
Hydrogen Peroxide	3.10E+03	NC	3.10E+04	NC		NC	N	4
Hydroiodic Acid*	3.07E+02	NC	3.07E+03	NC	2.46E-01	NC	N	12
Iodine	2.06E+01	NC	2.07E+02	NC	4.72E-04	NC	N	13
Isopropanol*	4.13E+02	NC	4.13E+03	NC	3.31E-01	NC	Y	2
Lead acetate*	9.69E-02	C	4.00E+02	C	6.90E-05	C	N	2
Lead*	3.21E+00	C	4.00E+02	C	6.90E-05	C	N	2
Lithium	4.45E+01	NC	4.13E+02	NC		NC	N	8
Lithium Aluminum Hydroxide	4.48E+01	NC	4.13E+02	NC		NC	N	8
Magnesium	1.07E+04	NC	2.61E+04	NC		NC	N	16
Magnesium Sulfate	1.07E+04	NC	2.61E+04	NC		NC	N	16
Manganese Oxide	2.58E+02	NC	3.47E+03	NC	2.32E-05	NC	N	1
Mercuric Chloride	6.19E-01	NC	2.35E+01	NC		NC	N	1
Mercury	6.67E-01	NC	2.35E+01	NC	1.42E-04	NC	N	1
Methamphetamine	5.00E-02	NC	6.20E+00	NC		NC	N	1
Methanol	6.03E+02	NC	3.06E+04	NC	8.28E-01	NC	Y	1
Methyl ethyl ketone	1.24E+03	NC	3.21E+04	NC	2.36E+00	NC	Y	1
Methylamine*	8.26E+04	NC	8.26E+05	NC	6.62E+01	NC	Y	5
Methylene chloride*	3.35E+00	C	8.90E+00	C	1.17E-02	C	Y	1
N,a,a'-trimethyldiphenethylamine	5.00E-02	NC	N/A	NC		NC	N	16
N,N-dimethylamphetamine	3.62E-01	NC	6.20E+00	NC		NC	N	2
Naphthalene	2.12E+01	NC	1.25E+02	NC	1.42E-03	NC	Y	1
N-formylamphetamine	3.62E-01	NC	6.20E+00	NC		NC	N	2
N-formylmethamphetamine	3.62E-01	NC	6.20E+00	NC		NC	N	2
n-Hexane	2.27E+04	NC	1.15E+02	NC	3.31E-01	NC	Y	1
Nitroethane*	1.83E+02	NC	1.83E+03	NC	1.47E-01	NC	Y	14
N-methyldiphenylethylamine	3.62E-01	NC	6.20E+00	NC		NC	N	6
Palladium	1.15E+02	NC	1.96E+03	NC		NC	N	4
Palladium Chloride	1.15E+02	NC	1.96E+03	NC		NC	N	4
Perchloric Acid	1.65E+00	NC	3.67E+00	NC		NC	N	1
Phenyl-2-propanone (P-2-P)	5.00E-02	NC	N/A	NC		NC	N	16
Phenylacetic Acid	6.03E+05	NC	1.03E+07	NC		NC	N	4
Phenylacetylchloride	5.00E-02	NC	N/A	NC		NC	N	16
Phosphine	6.45E-01	NC	1.83E+01	NC	1.42E-04	NC	N	1
Phosphoric acid*	6.15E+00	NC	1.49E+01	NC	4.73E-03	NC	N	1
Phosphorouspentachloride	4.30E-02	NC	1.04E-01	NC		NC	N	1
Potassium cyanide	7.84E+01	NC	3.06E+03	NC		NC	N	1

Pseudoephedrine	1.86E+03	NC	1.86E+04	NC		NC	N	16
Pyridine	1.21E+00	NC	6.11E+01	NC	1.66E-03	NC	N	1
Red Phosphorous*	6.19E+03	NC	6.20E+04	NC	4.97E+00	NC	N	5
Sodium	4.10E+04	NC	7.02E+05	NC		NC	N	3
Sodium acetate	4.10E+04	NC	7.02E+05	NC		NC	N	3
Sodium Carbonate	4.10E+04	NC	7.02E+05	NC		NC	N	3
Sodium cyanide	6.27E+01	NC	2.44E+03	NC		NC	N	1
Sodium Ethoxide	4.10E+04	NC	7.02E+05	NC		NC	N	3
Sodium Hydroxide*	4.72E+01	NC	4.72E+02	NC	3.78E-02	NC	N	2
Sulfuric Acid*	5.90E+00	NC	5.90E+01	NC	4.73E-04	NC	N	2
Thionyl Chloride	5.00E-02	NC	N/A	NC		NC	N	16
Thorium Oxide*	3.45E-01	NC	7.95E-02	NC	4.73E-04	NC	N	17
Toluene	1.65E+02	NC	5.21E+02	NC	2.36E+00	NC	Y	1
Tri-(-phenylisopropyl) amine	5.00E-02	NC	N/A	NC		NC	N	16
White Phosphorus	4.30E-02	NC	1.56E+00	NC	4.73E-05	NC	N	1

*Derived from Inhalation Toxicity Benchmark

References
1: Region 6 Human Health Medium Specific Screening Levels
2:California office of Health Hazard Assessment
3: International Programme on Chemical Safety
4: United States Environmental Protection Agency
5: National Research Council
6: National Institute of Drug Research
7: Handbook of Forensic Drug Analysis
8: Virginia Department of Health Bureau of Toxic Substances
9: European Food Safety Journal
10: Risk Assessment Information System
11: National Toxicology Programs
12: United Kingdom Department for Environment, Food and Rural Affairs
13: American Toxic Substances and Disease Registry
14: Committee on Updating of Occupational Exposure Limits, a committee of the Health Council of the Netherlands
15: State of Arkansas Guidelines