Cleaning Up Hazardous Chemicals at Methamphetamine Laboratories

Human health hazards can remain after law enforcement seizes and removes waste chemicals from a clandestine (secret) methamphetamine (meth) laboratory, because chemical and drug residuals often remain and may pose a health risk. Local health departments may be called upon to deal with those human health hazards. This fact sheet summarizes current Wisconsin Department of Health Services (DHS) recommendations for the cleanup of chemical residues at meth lab sites. Contact DHS for further assistance when dealing with high production meth labs. For more information on how to recognize a meth lab, contact the Narcotics Bureau of the Wisconsin Division of Criminal Investigations, Department of Justice.

What is methamphetamine?
Methamphetamine, also known as “meth,” “speed,” “crank,” “crystal,” and “ice,” is an illegal drug. Meth is a synthetic (man-made) drug that is a stimulant of the central nervous system. The effects of meth are similar to those of cocaine. It gives the user a “rush” or intense feeling of pleasure that lasts longer than cocaine.

Meth is an increasingly popular drug that can be injected, snorted, taken orally, or smoked. Long-term use leads to physical dependence. Meth may cause periods of high energy and rapid speech. Many regular meth users also experience severe depression, delusions, hallucinations, paranoia, and violent behavior.

Meth is typically made in clandestine makeshift laboratories, often in rented apartments, houses, or hotel rooms. During the production of meth, hazardous and flammable chemicals can be spilled or emitted to the air, and there is a risk of fire or explosion.

You should never enter an active meth lab where there are odd arrangements of attended or unattended containers of chemicals on a hot pad, chemical mixtures in soft drink bottles, unusual contraptions of tubing and containers, or out-of-place propane containers. Contact your local law enforcement immediately if you suspect a drug lab in your area.

What chemicals is meth made from?
Meth is made by creating a small chemical change in pseudoephedrine, a common cold and allergy drug. To create this change, pseudoephedrine is "cooked" with a variety of chemicals. There are many recipes for cooking meth. Some recipes use acids, bases, and solvents that are common in the home or at sellers of household goods. However, the poor handling and disposal of these chemicals, as well as mixing some of these chemicals, creates hazards.

Common household chemicals used in meth labs include flammable and volatile solvents (methanol, ether, benzene, methylene chloride, trichloroethane, and toluene), muriatic acid, sodium hydroxide, table salt, sodium, and ammonia. Some meth recipes use chemicals not commonly found in the home, such as red phosphorous, large amounts of iodine, and reactive sodium or lithium metal. Other hazardous chemical by-products can be formed during the cooking process as household chemicals are mixed together.
A meth recipe that is gaining popularity is the “one-pot” method, or “shake and bake.” Unlike earlier methods of cooking meth, this method combines all of the ingredients into one container, typically a two liter soda bottle. The reaction occurs without heating. This method produces a hot, fast reaction and is an explosion and fire hazard. The use of this method is a danger to law enforcement and civilians from explosions, fires, and exposure to dangerous chemicals. Containers of unlabeled chemicals found at labs, particularly capped bottles of mixtures containing clear or milky brown liquids, dark floating debris, and white solids, should only be touched by hazardous materials experts.

The many chemicals found in a meth lab, along with the drug methamphetamine, may contaminate a property after cooking. Carpeting, wallboard, ceiling tile, or fabric may absorb spilled or vaporized chemicals. Furniture or draperies may become contaminated. Outdoor disposal sites may also require evaluation and an environmental cleanup.

**What happens after a meth lab is discovered?**
When law enforcement agencies learn of the drug lab activities, they typically conduct an investigation that leads to a raid, arrests, and seizure of evidence. Hazmat-trained officials may be on hand to remove containers of hazardous materials and to screen indoor air. Law enforcement may call child protective services if children are involved.

Once containers of chemicals and equipment related to the meth lab have been removed, the health department will evaluate the property for long-term exposure risks from residual chemicals that remain on household items and surfaces. Additionally, the Department of Natural Resources may assess environmental impacts from outdoor chemical spills or improper waste disposal.

**Steps for a local health department after a lab seizure**
Before visiting and entering a former meth lab, call the local law enforcement agency and/or the Wisconsin Department of Justice, Division of Criminal Investigations (DCI) to get information on the seizure. Ask about:

- The amounts and types of chemicals used in the meth production.
- Whether there was evidence of solvent use, chemical spills, or unusual odors.
- Where the production was occurring.
- Whether it was a low or high production lab.
- The general level of sanitation existing on the property.

When visiting a site, especially the first time, have a member of local law enforcement or the DCI familiar with the case accompany you. The officer should be able to describe the situation, and can help in the event of unexpected encounters with occupants or visitors.

If there are occupants still in the home and the property has hazards that require the residence to be placarded, the occupants should be ordered to vacate as soon as possible. DHS has made a model order for meth labs available on PCA Portal for local and tribal health departments.

**Will exposure to chemicals in a meth lab result in harmful health effects?**
While in operation, or prior to a seizure, there is a high risk for exposure to harmful chemicals in meth labs. If you discover an active meth lab, do not attempt to enter. Back out and contact your local law enforcement agency immediately.
Many of the chemicals used in the “cooking” process can be harmful. Short-term exposures to high concentrations of chemical vapors that may exist in a functioning meth lab can cause severe health problems or even death. For this reason, meth “cooks,” their families, and first responders are at highest risk of health effects from chemical exposure, including lung damage and chemical burns to different parts of the body. Heating solvents inside a building can create a highly flammable situation; meth labs are often discovered when fire fighters respond to a fire or explosion.

After the police seize a meth lab and remove the obvious hazards, there is usually still a low exposure risk from chemical residues. Such contamination can pose a health risk and needs to be evaluated and cleaned up. Properties with meth labs often have serious sanitation and safety issues, such as building structural problems and electrical hazards. Sanitation issues can complicate the assessment of chemical hazard risk. The evaluation by law enforcement and local health departments needs to consider the overall condition of the property.

Residues of methamphetamine and other chemicals remaining at the meth lab are a concern for people who later use the property. For this reason, local health departments should thoroughly assess the property for hazards prior to allowing it to be re-inhabited, especially if by children.

When a meth lab is discovered in a multiple-unit dwelling, neighbors may be concerned about their exposure to hazardous chemicals while the lab was still active. Neighbors’ risk for exposure is usually very low, but it is important to address any nearby residents’ concerns.

**Exposures to children and child decontamination**

When a meth lab is seized and arrests are made, children residing at the meth house are taken into protective custody by Child Protective Services. Chemical exposures to these children are a concern, and there are conflicting opinions over the need to formally decontaminate children when they are taken into custody. DHS concurs with National Alliance for Drug Endangered Children’s (NADEC) recommendations that young children should not undergo the trauma of rigorous field decontamination unless medically indicated. The NADEC has developed a protocol for the medical evaluation of children found in drug labs. That information can be found at [http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1011&context=ccflpubs](http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1011&context=ccflpubs).

**What kind of protective equipment can prevent chemical exposure?**

After the meth lab has been declared safe for entry by law enforcement, but before lab chemicals and equipment are removed, only authorized people should enter the property. These people should wear, at a minimum, protective eyewear, hand protection (e.g., disposable latex or nitrile gloves) and foot covering. A disposable protective jumpsuit (e.g., Tyvek) may be necessary depending on the extent of contamination. If toxic fumes or vapors are suspected, only trained professionals should enter and clean the building with appropriate safety equipment.

**How can a meth lab be cleaned up?**

There is no federal standard for how properties with a meth lab should be cleaned. However, the U.S. Environmental Protection Agency (EPA) has released Voluntary Guidelines for Methamphetamine Laboratory Cleanup. This document can be found on the EPA website or at this link: [http://www2.epa.gov/sites/production/files/documents/meth_lab_guidelines.pdf](http://www2.epa.gov/sites/production/files/documents/meth_lab_guidelines.pdf). The guidelines are
geared towards state and local government personnel charged with remediating or otherwise addressing former meth labs. This document helps disseminate the best available knowledge and research on meth lab remediation. It will also prove useful to cleanup contractors and could be a resource for homeowners.

In some cases, scrubbing and painting walls and ceilings is all that is necessary to restore a former meth lab to a safe living environment. Sometimes, contamination is so broad and extensive that the inside of the building needs complete renovation. Across the U.S., the response to cleaning up former meth lab properties ranges from minor cleaning to complete demolition of buildings. Some meth labs require soil and/or groundwater cleanup as well, depending on the extent of how and where chemical wastes were managed.

*Property owners are responsible for proper cleanup and costs.* Owners who decide to clean buildings on their own should be aware that household building materials and furniture may absorb contaminants and retain odors. The possibility of hazardous chemical fumes from furniture should be considered and evaluated. Private cleanup contractors can be hired to conduct building cleanup as well. Local and tribal health departments can contact DHS to discuss available cleanup contractors.

**Is sampling needed at former labs?**
Every meth lab is different in size and extent of contamination, so DHS guidance recommends that local health officers use their judgment and authority to determine if sampling is needed. DHS can assist in helping make this determination.

If sampling will be conducted at the site, DHS recommends using the methamphetamine clearance goal of 1.5 ug/100cm², which was promoted in the EPA guidance. Depending on the specific property, sampling may not be needed. A thorough common-sense cleanup (which might include repair or disposal of some surfaces or appliances), followed by a visual assessment and walk-through, may be sufficient to return the residential building to acceptable living conditions.

If it is suspected that chemicals have been dumped or spilled on the ground, in a septic system, or in surface water, the Department of Natural Resources will assess the need for environmental sampling. The DNR has specific guidelines to address environmental contamination.

**Should testing be done after cleanup?**
Testing can be done after cleanup, but in many cases, the evaluation may conclude that a process of thorough cleaning and painting of the property is sufficient to restore the residential property to a safe living condition. The cleaning procedures outlined in this document, when followed correctly, should be adequate for reducing any health hazard risk. In cases where it appears contamination has been more extensive, or where a contractor is hired to restore the property, testing for meth residue may be advised. If you are dealing with a high production meth lab, call DHS for more assistance. The DCI will determine if the site was a high production lab.

**General guidelines for building cleanup**

*General sanitation.* General sanitation issues such as filth, squalor, and pests often complicate the assessment process at meth labs.
Air out the building. After law enforcement officials seize a lab, professionals trained to handle hazardous materials remove lab waste and any bulk chemicals. During this removal, every effort is made to air out the building for the safety of the removal crew. For security reasons, the building is usually closed upon their departure. The short-term airing-out may not be sufficient to clear the indoor air of solvents that were spilled and remain inside. The building may need to be aired out for several days before and during cleaning. Exhaust fans can be set up, if needed, to circulate the air. During this time, the building should remain off limits to occupants unless it is necessary to make short visits to the property.

After cleaning and airing out the building, it should be re-checked for staining and odors, as these are indicators of residual contamination. If odors and stains remain, more extensive cleanup steps should be taken.

Remove and dispose of contamination. During the meth “cooking” process, spilled chemicals may have contaminated household items. Also, particles of the methamphetamine drug may have dispersed and adhered to surfaces. Remove, double-bag, and properly dispose of any items that are visibly contaminated, especially with red, brown, or yellow stains.

Absorbent materials, such as carpeting, drapes, clothing, furniture, etc., can accumulate dust or splattered chemicals during “cooking.” These materials should be considered for disposal, even if an odor or discoloration is not present.

If you find suspicious containers or lab equipment at the property, do not handle them. Some items may have been accidentally left behind by law enforcement. Leave the area and contact your local law enforcement agency or fire department.

Inspect surfaces, remove or clean as needed. Surfaces such as walls, counters, floors, and ceilings are porous and can adsorb contamination from meth preparation. This contamination can easily spread to nearby rooms where meth was not “cooked.” Thorough cleanup is important, especially for food preparation surfaces.

If a surface has visible contamination, staining, or gives off odors, complete removal and replacement of the surface is recommended. This could include removal and replacement of wallboard, floor coverings and counters.

Appliances where meth was stored or prepared, such as refrigerators, kitchen ranges, or ovens, should be discarded and disposed as solid waste.

Wear gloves, protective clothing with long sleeves, and eye protection while cleaning. Ventilation of the building should be continued throughout the cleaning process.

Inspect plumbing. Waste products may have been dumped down sinks, drains, and toilets. These waste products can collect in drains, traps, and septic tanks and give off fumes.

If a chemical odor is coming from household plumbing, or if drains are clogged, do not attempt to address the problem yourself. Contact a plumbing contractor for professional assistance. Let the
contractor know that the property is a former meth lab and inform him/her of the types and quantities of chemicals that may have been flushed down the drains. The amount of chemicals dumped in soil or septic systems are usually not enough to cause environmental damage. If you suspect the septic tank or yard may be contaminated, contact the local health department or DNR for advice.

Repaint surfaces. After a surface has been cleaned, priming and painting that surface should be considered, especially where contamination was found or suspected. Painting makes a barrier between residual contamination not removed by cleaning and anyone who may come in contact with those surfaces. Painting will cover up and "lock" the contamination onto the surface, reducing the chance of it being released into the air.

Summary steps for building cleanup
Contact your local law enforcement agency to determine what chemicals were present at the time of seizure.

1. Have local law enforcement personnel accompany you when visiting the site.
2. Thoroughly ventilate the building before and during cleanup.
3. Bottles of unlabeled chemicals, particularly bottles of mixtures containing clear or milky brown liquids, dark floating debris, and white solids should only be touched by hazardous materials experts.
4. Until a former meth lab is cleaned, do not enter the area without foot and hand protection (shoes and gloves) at a minimum.
5. Remove visibly contaminated items or items that have a chemical odor or red, yellow, or brown stains.
6. Clean all surfaces using household cleaning methods and proper personal protection.
7. Leave plumbing cleaning to the experts.
8. Air out the building for three to five days.
9. If odors or staining remain, have the building evaluated by a professional.

For more information, contact:
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Figure 1: Example of an incomplete "one-pot" reaction that may be found at a meth lab.