

## **The Safety Guys: Tearing Down the House? Clan Lab Remediation - Part 2**

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This issue's Safety Guys column is the final one in our initial series on clandestine drug laboratories. For first-time readers, let us get you up to speed with a quick review. This will also serve as a refresher for our regular readers and point you to previous articles in the series for those that want the "rest of the story." The first article in the series provided an introduction to "clan labs" with a brief history and background on the growing epidemic. That was followed by "What's Cooking?" which discussed the different methods of manufacture or "cooking" the illegal drugs at clandestine laboratories, the chemical ingredients used and the hazards associated with those chemicals. The first remediation feature dealt with the cleanup of clandestine laboratories – what is referred to as the assessment of residual contamination and proper remediation. This article will continue on the topic of the remediation process by looking at the next steps of conducting residual sampling, remediation, and final clearance assessments.

To recap the complete process, there are three stages involved to advance the site from discovery to final cleanup. The initial phase, immediately after discovery of the clan lab, involves specially trained law enforcement personnel securing the site and crime scene investigators processing it for evidence. During the second stage, chemicals and wastes are inventoried and gross contamination is removed from the site. The final step involves testing for contamination left behind and cleaning up the site for reuse or re-occupancy. The first two phases are usually handled by federal, state, and local law enforcement and their specialty contractors. But the property owner is responsible for cleaning up the property, which may prove costly and time-consuming due to potentially contaminated surfaces, furnishings, fixtures, and environment. Reported cleanup costs can reach \$20,000 and more and average around \$5,000.

### **COMPREHENSIVE CONTAMINATION ASSESSMENT**

Experience dealing with clandestine drug lab sites, well documented in the literature, dictates that these sites be thoroughly evaluated and remediated before they can be used again.<sup>1,2,3,4</sup> More and more states are enacting legislation to ensure this process is properly carried out and documented. During the first part of this final stage, we performed the PSA (preliminary site assessment, described in our previous article). We collected all available information and noted the cooking method used and the chemicals both expected and found. We conducted a walk-through evaluation and identified locations of cooking, storage, and disposal. We should have screened for hazardous chemicals present using appropriate instruments and developed our safety plan for subsequent entries and cleanup.

Depending on the extent and severity of the contamination noted in the PSA, a more comprehensive assessment may prove beneficial and time-saving. For instance, if the clan lab activity appeared relatively recent and limited, thorough evaluation may greatly reduce the scope of cleanup if it can be shown that unaffected areas are contaminate-free. So, a little extra time and money spent conducting a detailed assessment could go a long way to curtailing remediation costs. What we are suggesting here is a strategic sampling of the clan lab site in order to

positively quantify where contamination exists and pinpoint areas needing remediation. The tough part is deciding what or whose criteria levels you should follow. If your state has regulations dealing with clan lab cleanup, this is decided for you and therefore much easier. If not, you will need to do a little more homework. Read on.

## **STRATEGIC SAMPLING ASSESSMENT**

We believe that most clandestine drug lab sites can benefit from some strategic sampling. There is no substitute for experience and good judgment at this stage, so make an effort to find the best-qualified professionals before proceeding.

We mentioned that many states now have legislation dealing with this problem and information is readily available on their respective web sites (see references at the end). The most common parameters are methamphetamine and its precursors (ephedrine and pseudoephedrine); volatile organic compounds (VOCs); and, if the P2P or amalgam method was used, lead and mercury. VOCs are determined using portable photo-ionization detectors. Methamphetamine is ascertained using wipe sampling, as is lead. Mercury can be detected using wipe samples or direct reading mercury analyzers employing atomic adsorption spectrometry for air sampling (the preferred method).

Before beginning any sampling, check to see if your state has any regulations or guidance documents and be sure to comply with these. In most cases, they not only specify acceptable contaminate levels but also provide sampling methods and protocols. These are particularly important with wipe sampling because of the inherent variability and inefficiency of the methods.

When performing wipe sampling, consistency is key. If the applicable standard is based on a 100-square centimeter sample, make and use a template of the proper size. Determine if wipes are to be pre-moistened (usually methanol) and follow correct wiping technique – side-to-side horizontal overlapping Zs or rows, fold inward, then up and down vertical overlapping Ns or columns, fold inward and place in clean appropriate container. Also, follow proper quality control protocols such as donning new gloves for each discrete or composite sample and collecting the appropriate number of lab QA/QC samples.

A warning on compositing (adding wipes together to make a single sample) samples is needed. This popular means of reducing analytical costs should be used with care and only for those similar areas, in the consultant's judgment, that are anticipated not to be contaminated. For example, good candidates for compositing are well removed from cooking, storage, and disposal areas; heavily stained areas; and high-traffic pathways. This would include areas such as bedrooms, closets, and upstairs rooms. Keep in mind that a positive composite sample result may require re-sampling of all individual surfaces represented.

Finally, depending on evidence gathered during the PSA and your scope of work, environmental sampling of burn sites, trash pits, discolored soils, and surface or ground water may be needed. One excellent guidance document is the Washington State Department of Health's Guidelines for Environmental Sampling at Illegal Drug Manufacturing Sites.<sup>6</sup>

## **REMEDICATION AND FINAL CLEARANCE**

Once you have the sampling data, hopefully you can target specific areas that will require cleanup and know which areas or rooms are not affected. With knowledge of the types of surfaces in the target areas, you can evaluate the best remediation technique. Included among these are:

Removal – used for porous materials like carpeting, wallpaper, window treatments, fabric furniture, clothing, appliances used in the cooking process, and any article where the cost of cleaning and analytical testing exceeds the cost of replacement.

Surface washing – used on non-porous and some semi-porous surfaces such as countertops, tile, flooring, and ceiling. Includes pressure washing, detergent washing, solvent washing, steam cleaning, and others.

Encapsulation – used on porous and semi-porous surfaces where removal is very costly and washing is not appropriate such as ceilings, drywall, concrete flooring, block walls, etc. Oil-based paints, varnishes, epoxies, and similar coatings should be used to prevent any chance of bleed through.

Central ventilation systems present a tough challenge. If present, chances are they were on and in use during cooking operations. Therefore, the potential exists for the entire system to be affected. At a minimum, we suggest replacing all filters and giving the air handler and coils a thorough cleaning. This should be done as the very last cleanup item. After filter change and cleaning, run the system flat out for 24 to 48 hours to flush out any remaining contaminants. Even after this, sampling should be carried out on key components such as return air grill and plenum, fan blades, coils, and room diffusers. If contamination is found, removal and replacement is the only real fix.

When remediation is complete, any areas or furnishings that exceeded the cleanup criteria, also referred to as “fit for use” or human occupancy standards, and were not removed or replaced must undergo post-remediation assessment. Sampling is conducted identical to the initial assessment phase. All levels must be below applicable limits. For example, in Alaska, Arizona, California, Tennessee, Washington, and some others, the limit for methamphetamine is <math>0.1\text{ microgram per }100\text{ cm}^2</math>. A few more, Colorado, Missouri, Minnesota for example, allow from  $1\text{ ug per ft}^2$  to  $5\text{ ug per ft}^2$ . Any areas that exceed established limits must be re-cleaned or re-encapsulated and then re-sampled. Where environmental (soil, water) contamination is present the cleanup levels are set by the Environmental Protection Agency or state equivalent.

We have provided a brief overview of the final step in cleaning up and remediating a clandestine drug lab property. For more comprehensive information you should investigate the excellent online resources listed below. We hope this series was helpful and informative. As always, we welcome feedback and questions. Until next time, remember, Safety First!

## References

Clandestine Drug Lab General Cleanup Guidance, Minnesota Department of Health and Minnesota Pollution Control Agency, St. Paul, MN., July, 2006.

Criteria for the Assessment and Remediation of Clandestine Metham-phetamine Laboratories, Sacramento County Environmental Management Department, Hazardous Materials Division. Sacramento, CA. May, 2003.

Cleanup of Clandestine Methamphetamine Labs Guidance Document, Colorado Department of Public Health and Environment, July, 2003.

Procedures for the Assessment and Remediation of Clandestine Methamphetamine Laboratories, Solano County Department of Resource Management, Fairfield, CA. January, 2006.

Guidelines for Environmental Sampling at Illegal Drug Manufacturing Sites. Washington State Department of Health, November, 2005.

<http://www.usdoj.gov/dea/resources/redbook.pdf> - US Department of Justice Drug Enforcement Administration, Guidelines for Law Enforcement for the Clean up of Clandestine Drug Laboratories. 2005.

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*We welcome your comments and questions.  
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*Editor's Note: The Safety Guys' entire series on clandestine laboratories and their cleanup can be found on the Forensic Magazine@website, [www.forensicmag.com](http://www.forensicmag.com)., under the Magazine Articles tab. Direct links are as follows:*

*Forensic Magazine@June/July 2007, Introduction to Clandestine Drug Laboratories A Serious Health and Safety Concern, <http://www.forensicmag.com/articles.asp?pid=155>.*

*Forensic Magazine*®August/September 2007, *What's Cooking?*,  
<http://www.forensicmag.com/articles.asp?pid=165>.

*Forensic Magazine*®October/November 2007, *Tearing Down the House? Clan Lab Remediation*  
- Part 1, <http://www.forensicmag.com/articles.asp?pid=173>.