

CLEANUP AND REMEDIATION OF METHAMPHETAMINE LABORATORIES: A FORUM ON RESEARCH, LAWS, POLICIES & GUIDELINES

**August 7 – August 8, 2008
Hotel Santa Fe
Santa Fe, NM**

BACKGROUND

On August 7 and August 8, 2008, the National Alliance for Model State Drug Laws (NAMSDL) convened a day-and-a-half Forum in Santa Fe, New Mexico to discuss the issues surrounding the cleanup and remediation of properties contaminated by methamphetamine laboratories. NAMSDL brought together its Cleanup and Remediation Working Group members from around the country. These select state, local and tribal officials research issues related to methamphetamine laboratories and contaminated properties, draft laws and regulations to manage the associated problems, and write and implement cleanup and remediation policies and guidelines. The Forum attendees also included representatives from the U.S. Environmental Protection Agency (EPA).

NAMSDL will use the information and recommendations that surfaced at the Forum to help accomplish two goals. First, to finalize NAMSDL's 2008 edition of *Common Themes Regarding Properties Where Controlled Substance Laboratories Are Found*.¹ Second, to help identify any model legislation that NAMSDL should draft to assist states in addressing the ongoing problems resulting from methamphetamine laboratories and contaminated properties.

EPA also drew upon the extensive expertise of the Working Group members and sought their input pertaining to the EPA's draft methamphetamine remediation document, *Voluntary Guidelines for Meth Lab Cleanup (Guidelines)*.²

The Forum was divided into four distinct parts: updates on research, highlights of designated state programs, an overview of EPA's *Guidelines*, and participants' prioritized recommendations regarding the *Guidelines* and remediation issues. The first session on August 7, 2008, titled *Research: Current Findings and Research Needs*, reviewed the status of research initiatives related to methamphetamine contamination. Dr. Salocks of the California Environmental Protection Agency summarized his ongoing research efforts to establish a new, health based remediation standard in the state of California. He was followed by Dr. Martyny of the National Jewish Medical Research Center who presented his research findings on the extent of residual contamination at properties that have been used as methamphetamine laboratories.

¹ The National Alliance for Model State Drug Laws, *Common Themes Regarding Properties Where Controlled Substance Laboratories Are Found* (Sept. 19, 2008) (on file with NAMSDL).

² The July draft version of the EPA's *Guidelines* has been circulated nationally by the EPA several times. The EPA estimates a final draft of the *Guidelines* will be available in December 2008.

The second session on August 7, 2008 was titled *Laws, Policies, Guidelines: State Snapshots*, and looked at the topic of remediation from geographically distinct perspectives. Gregory McKnight of the Washington Department of Health, Shalece Kofford of the Utah Department of Health, and Jim Morrison of the Tennessee Department of Environment and Conservation provided individual synopses of the laws, policies and guidelines that establish and guide their home states' response to contaminated properties. The presentations noted key differences in regional issues and regional responses to those issues.

During the third session that day titled *Emerging Voluntary Guidelines*, Lisa Boynton of the EPA outlined the history and purpose behind EPA's *Guidelines*, and summarized their status and content. She identified the 2006 White House Synthetic Drug Strategy³ and the Methamphetamine Remediation Research Act of 2007⁴ as the driving forces behind the *Guidelines*. Katie Garvey and Kristin Pene of SRA, International, Inc. (SRA),⁵ outlined the approach and considerations taken in drafting the *Guidelines*, and potential issues to be addressed as had been identified by numerous agencies, individuals and stakeholders that had reviewed previous draft versions.

The final hours of the first day were a brainstorming session in which participants voiced their comments, feedback and general suggestions regarding the *Guidelines*. Additionally, people exchanged ideas and thoughts about the details local, state, tribal and federal governments should bear in mind when contemplating methamphetamine laboratory cleanup policies, laws, regulations and guidelines.

From the information shared in the day's presentations, questions and answers, and brainstorming, NAMSDL staff identified four major topics and related issues which repeatedly surfaced. Four working groups, one per topic, were created: 1 - Bleaching, Washing & Intrinsic Value, 2 - Encapsulation, Flooring & Connecting Structures, 3 - HEPA Systems, Septic Systems & Field Screening, and 4 - Research Needs & Associated Costs.

On August 8, 2008, each available participant, based on experience and expertise, joined the topical working group where he or she could contribute the most value to the discussion. NAMSDL staff asked working group members to prioritize and explain in detail their recommendations on their groups' designated primary topic and pertinent sub-topics. In crafting their proposals, the working groups were able to state priorities for (1) refinement of the

³ "As part of the Administration's *Synthetics Strategy*, the Government aims to improve our national understanding of identifying the point at which former methamphetamine laboratories become clean enough to inhabit again. By January 2008, the Administration, led by the EPA in close coordination with the DEA, will publish guidelines identifying the best practices (beyond the compilation of State guidelines that currently exists) and include any relevant findings from the research effort described below for the remediation of former methamphetamine laboratories."

⁴ Pursuant to the MRRA, the EPA was required to convene a conference of appropriate state agencies, individuals and organizations involved in research and activities directly related to the environmental or biological impacts of former methamphetamine laboratories. The EPA was further required to work with state and local governments and other non-federal agencies and organizations to promote and encourage the appropriate adoption of the guidelines.

⁵ SRA International, Inc. is the EPA contractor that has been working with the EPA to draft the *Guidelines*.

Guidelines, and (2) cleanup and remediation responses by local, state, tribal and federal policymakers. EPA and SRA representatives attended the working groups to gather guidance from the discussions and to answer questions pertaining to the *Guidelines*.

After two hours of individual group debate and discourse, the working group members rejoined each other in a closing plenary session. A member of each group reported out his group's priorities, recommendations and issues for consideration, with the other participants asking questions and clarifying points.

This summary presents for each working group a brief overview of the topics that were discussed followed by that group's recommendations.

WORKING GROUP 1: BLEACHING, WASHING & INTRINSIC VALUE

Group Members

Stephen Connolly, New Mexico Environment Department (Reporter)

Curry Blankenship, Cherokee Nation Environmental Programs

Colleen Brisnehan, Colorado Department of Public Health and Environment

Terrel Mitchell, Cherokee Nation Environmental Programs

Jim Morrison, Tennessee Department of Environment and Conservation

Kent Schierkolk, Kansas Department of Health and Environment

Larry Souther, Minnesota Department of Health

Kristin Pene, SRA International, Inc. (Observer)

Topics of Discussion

- The use of certain cleaning solutions, including bleach and other proprietary solutions, and possible chemical reactions that might occur with methamphetamine residue or other contaminants.
- Washing clothing and other fabric items that are found in a lab site. This includes whether or not certain items should be washed or discarded, and the consideration of an item's intrinsic value when determining whether it should be disposed of or remediated. If items can be washed effectively, the focus was on how many times items should be washed, what they should be washed with and where they should be washed.
- The need for a final report authenticated by a remediation contractor, industrial hygienist, or other individual or entity remediating a contaminated property noting the methodologies used during remediation.

Recommendations

Bleaching

- Add verbiage to Section 3.13 on page 20 of EPA's *Voluntary Guidelines for Meth Lab Cleanup (Guidelines)* that addresses whether proprietary cleaning solvents can be used to remediate contaminated structures. If proprietary cleaning solvents are to be used, the manufacturer or the remediation firm should be required to show the effectiveness of the proprietary cleaning solvent and the solvent's byproducts.
- Add a list of "Do's" and "Don'ts" to the *Guidelines* indicating what should and shouldn't be used when washing a contaminated structure. The first "Do": Use a detergent water wash which is the only proven acceptable method right now. If a person is going to use anything different, like an oxidizer, the burden is on the person to demonstrate its effectiveness and that it is safe and it won't leave anything behind. A person should only use the proven method unless he or she can prove to the appropriate agency that the alternative method is going to be safe and effective.

Washing

- The *Guidelines* recommend discarding stained clothing and washing contaminated clothing three times. These standards should not be changed. Stained clothing should always be discarded and the number of washes recommended in the *Guidelines* should not be decreased, even though state studies might indicate that one or two washes will render washed clothing safe for use.
- The *Guidelines* and state and federal policies should include the possibility of decontaminating select items, such as items that belong to a child that is being displaced. When determining whether to allow washing of contaminated clothing or other washable items, the intrinsic value of those items should be considered, particularly in instances of washable items belonging to a child who is being displaced.
- Washing machines found in contaminated properties should be used to wash clothing and other items that will not be discarded and will subsequently be removed off site. An empty load should be run first to rinse the machine. The onsite machine should then be used to complete the recommended three wash cycles, without drying in between washes. The onsite dryer should not be used to dry clothing; clothing should be taken offsite and dried somewhere else.
- Clothing that was present during a cook should be treated differently than clothing that was not present during a cook but is present in the contaminated structure. The latter clothing may require different cleaning methodologies.
- The *Guidelines* should recommend detergents that can be used safely and effectively, such as non-oxidizing detergents, and those that cannot, such as bleach.
- The *Guidelines* should not recommend a water temperature for washing contaminated clothing. There is no conclusive evidence that water temperature significantly affects the removal of contamination.
- Where machine washing is recommended or allowed, recommended load size should remain small until there is research performed on large load sizes.

Intrinsic Value

- Intrinsic value should be considered on a site by site, case by case, item by item basis in combination with an item's value, ownership, and level of exposure and contamination. The likelihood of decontaminating to a level safe for human contact should also be considered.
- State landlord/tenant laws should address a landlord's right to remove and dispose of a criminal (methamphetamine laboratory operating) tenant's belongings when those belongings have not been removed by the tenant.

Final Report

- The *Guidelines* should require a final report to be completed that would include the methodology used for the cleanup and proof of disposal of hazardous and/or contaminated waste. The final report should be like any corrective action report and would likely include other requirements certifying that cleanup and removal has been completed in compliance with local, state, and federal requirements.

WORKING GROUP 2: ENCAPSULATION, FLOORING & CONNECTING STRUCTURES

Group Members

Bill Rees, Utah Department of Environmental Quality (Reporter)
Jim Faust, Idaho Department of Health and Welfare
Deb Grimm, Montana Department of Environmental Quality
Leo Henning, Kansas Department of Health and Environment
Brett Sherry, Oregon Department of Human Services
Scot W. Tiernan, Alaska Department of Environmental Conservation

Lisa Boynton, U.S. Environmental Protection Agency (Observer)

Topics of Discussion

- When and under what circumstances encapsulation is appropriate, and what materials are most effective.
- How to acknowledge that residual contamination has been left behind - when to disclose that a property has been contaminated by a meth lab and when to stop disclosure.
- Contamination of flooring and subflooring, carpet and carpet pads, including when cleaning carpet might be appropriate in lieu of disposal.
- How to address connecting structures and testing when access is denied by the owner.
- Residual contamination of attic spaces and remediation needs.

Recommendations

Encapsulation

- Always require removal and remediation. Encapsulation should only be performed after remediation has occurred and a cleanup standard can't be met. Never perform encapsulation in lieu of remediation.
- Because encapsulation is often times performed when cleanup standards can't be met, there should be some acknowledgement that residual contamination has been left behind. This could be in the form of a property registry or listing.
- States or local health jurisdictions should maintain a comprehensive list of contaminated sites.
- Stronger disclosure laws should be enacted nationwide to notify future tenants and owners of a property's contamination.

- When encapsulation is allowed, sampling should still occur to ensure that remediation standards have been met. However, the timing of testing should be left up to individual states' discretion.
- When concerns of asbestos contamination exist, there should be coordination between asbestos contractors and methamphetamine remediation contractors to ensure safe, effective remediation.

Recommendations for Research Projects

- Research needs to be conducted to determine what primers, urethanes and/or paints are best for encapsulation, and if encapsulation occurs, how much methamphetamine bleeds out of different encapsulation materials over time.
- Research which materials are the best materials to encapsulate specific items, such as porous items, and hard, non-porous items.

Flooring

- Carpeting in an area of gross contamination or from a cook area should always be removed and disposed of because it can't be cleaned and sampled effectively, and there is little to no intrinsic value.

Connecting Structures

- As a general rule, where common ventilation systems exist, samples should be taken and tested from the cook area outward until the nature and extent of contamination is defined. Contamination should be cleaned where it poses a risk.
- As a general rule, unless gross contamination exists in an attic, attics should not be remediated because there is little risk of exposure. However, if the use of the attic changes in the future, cleanup should be considered.

WORKING GROUP 3: HEPA SYSTEMS, SEPTIC SYSTEMS & FIELD SCREENING

Group Members

Gregory McKnight, Washington Department of Health (Reporter)

Anna Fernandez, Hawaii Department of Health

Thomas Hunting, Arkansas Department of Environmental Quality

Greg Art Vollmer, New Mexico Environment Department

Katie Garvey, SRA International, Inc. (Observer)

Topics of Discussion

- The use and merits of HEPA systems and other vacuum and filtration systems during remediation.
- When field screening and testing of septic tanks should occur to indicate contamination.

Recommendations

HEPA

- The *Guidelines* should include a definition of “HEPA” and how it works.
- The phrase “HEPA vacuum” as is used in the *Guidelines* should be changed to “HEPA filter”.

Field Screening and Septic Systems

- Language in the *Guidelines* should be changed to specify on-site septic systems, distinguishing privately owned systems from public systems. This definition would capture privately owned systems, including those shared by small communities such as trailer parks and large apartment complexes.
- Field screening should be used to evaluate septic system contamination. However, there was no group consensus as to when to sample the system – at the beginning of remediation or after the property has been remediated - primarily because recontamination can occur through waste water dumping.
- Remediation of septic systems should occur at the end of a remediation project in order to ensure that any chemicals that are dumped into the septic system during the remediation of the property are removed.

WORKING GROUP 4: RESEARCH NEEDS & ASSOCIATED COSTS

Group Members

Charles Salocks, California Environmental Protection Agency (Reporter)

Eric Janus, University of Maryland University College

Shalece Kofford, Utah Department of Health

Kim Leingang, Kentucky Division of Waste Management

Kathy Marshall, Illinois Department of Public Health

Marilyn Parker, North Carolina Department of Health and Human Services

Rich Rosky, National Meth Chemicals Initiative Southwest Meth Initiative

Will Service, North Carolina Division of Waste Management

Jace Cujé, U.S. Environmental Protection Agency (Observer)

Topics of Discussion

- Research projects that are needed to further understand the issues related to methamphetamine contamination, along with prioritization of those projects.
- Estimated costs and requirements of each project. **NOTE:** The estimated costs listed below are refinements of preliminary figures discussed at the Forum. Subsequent to the August meeting, additional info was gathered to ensure the most accurate estimates possible for the prioritized projects. The included cost estimates are not inflated. Cost estimates reflect the direct costs of conducting the studies and do not include overhead: overhead can vary between 30% and 100%.

Recommendations for Research Projects

HIGH PRIORITY

- A long term study designed to investigate the dispersion and persistence of chemical residues in a residence. The study would require a dedicated building, most likely an existing building on a military base or a national lab, where multiple methamphetamine cooks could be conducted in order to study long term contamination issues, including dispersion of methamphetamine and other contaminants throughout the building. Dispersion throughout the building and persistence within and on the surface of different materials (e.g. wallboard, upholstered furniture, ceramic tile, vinyl flooring) would be studied. This may require use of stable-isotope (deuterium) labeled methamphetamine (or pseudoephedrine). **Estimated cost: ≥ \$500,000.**
- Meth as an indicator of other contaminants. The study would be aimed at answering the question, “Is methamphetamine a good indicator chemical for the presence of other contaminants in these environments?” Contaminants that are thought to be problematic (i.e., toxic and present at potentially harmful levels) such as mercury, lead, volatile organic compounds, iodine, phosphine, and methyl iodide need to be identified. The project would cover an extended study with data collection at one week, one month, six months, and one year that correlates residual methamphetamine contamination with other contaminants, focusing on how these other contaminants disperse, persist and/or degrade

in comparison with methamphetamine. **Estimated cost: between \$200,000 and \$300,000.**

- Examination of possible off-gassing of contaminants from building materials. The study would address the risks associated with off-gassing of volatile chemicals (e.g., phosphine, iodine and methyl iodide) from different types of building materials – effectively determining whether off-gassing of volatile and semi-volatile contaminants from methamphetamine synthesis represents a long-term health risk. Flux chambers would be used to assess the rate of emissions from porous construction media (especially wallboard and upholstered furniture). **Estimated cost: between \$30,000 and \$35,000.**
- Evaluation of cleaning agents for remediation of former clandestine methamphetamine labs. Generally, the study would evaluate the efficacy of cleaning solutions that account for the chemical characteristics of methamphetamine. This includes an analysis of agents such as bleach and hydrogen peroxide that chemically break down and destroy methamphetamine and other contaminants, looking at:
 - efficacy;
 - the time required for them to work;
 - degradation by-products and the potential toxicity of these by-products (a particular concern is potential formation of meth cathinone, which is itself a psychoactive drug with effects similar to those of methamphetamine);
 - physical effects on the material being cleaned (especially paint and wallboard); and
 - potential toxicity to the persons using these agents.

The study would also include a component designed to evaluate cleaning agents that take advantage of the stability of methamphetamine hydrochloride at low pH, based on the theory that if methamphetamine can be maintained as a hydrochloride salt, a form in which it is non-volatile and water-soluble, it will be easier to clean. **Estimated cost: between \$60,000 and \$75,000.**

- Cleaning methods for carpet and flooring. The study would be designed to determine whether carpet and flooring can be remediated safely and effectively – the *Guidelines* recommends that carpet and flooring should be removed and disposed of. The carpet cleaning study should include carpet pads and sub-flooring, and other items such as upholstered furniture and mattresses. The study should address different cleaning devices, hot water extraction, the financial cost of replacing carpet, and the necessity to decontaminate the cleaning equipment. **Estimated cost: between \$20,000 and \$30,000.**
- Evaluation of methods for skin decontamination. The rate of dermal absorption of some chemicals, such as the mosquito repellent DEET, is actually accelerated by soap and water. This effect is referred to as “wash-in”, and there is concern that the phenomenon may be applicable to methamphetamine, which has an octanol:water partition coefficient

that is virtually identical to that of DEET. The study would focus on determining whether soap and water washing accelerates the dermal absorption of methamphetamine, by tracking the rate of absorption before and after skin washing. The study would also evaluate alternatives to water/soap washing, such as low pH washing solutions and high molecular weight surfactants. It is anticipated that the results of these studies would improve decontamination procedures for first responders and remediation workers. **Estimated cost: \$35,000.**

- Surface-to-Skin transfer efficiency. In the models that are used to estimate the exposure that an individual might receive from residing in a former clandestine methamphetamine lab, surface-to-skin transfer is a critical parameter. The study would be designed to evaluate the transfer efficiency of methamphetamine from unremediated and remediated surfaces to improve estimates of exposure. Typically, these are “hand press” studies in which persons wearing gloves place their hands firmly against a contaminated surface for several seconds. The gloves are then removed, extracted with a solvent and analyzed for methamphetamine. The amount removed by the gloves is compared to the amount present on the contaminated surface to estimate the efficiency of transfer. **Estimated cost: \$30,000.**

MEDIUM PRIORITY

- Contractor cleaning and monitoring, on-going education. This study would evaluate the effectiveness of performance based cleanup (cleanup that must meet a target cleanup standard but is not concerned with the steps taken in order to meet the target cleanup standard) versus prescriptive based cleanup (cleanup that outlines the steps that must be taken to meet the target cleanup standard). **No estimated cost provided.**
- Immunoassay v. GC/MS for analysis of methamphetamine. Research needs to be conducted on the reliability of immunoassay to determine whether it is a reliable alternative to gas chromatography-mass spectrometry (GC/MS), as the use of immunoassay decreases costs associated with remediating a property and results are available in a more timely fashion. **Estimated cost: \$35,000.**

LOW PRIORITY

- There is a lack of published research reports on remediation of former clandestine methamphetamine labs. Publication of research reports needs to be encouraged. Peer review of these research reports is also needed. The cost is hard to determine due to the vast amount of grey research. **No estimated cost provided.**
- Examination of the effects of long-term, low level exposure to methamphetamine residues on neurological development in children. The research project would be a prospective epidemiology study, looking at children that reside in former lab sites and tracking their development. The ideal study would be ongoing and would include children who move into and reside in former clandestine methamphetamine labs. **Estimated cost: ≥ \$300,000.**

- Landlord education. **No estimated cost provided.**
- Evaluation of the relative risk of other drugs. A formal evaluation of the risks associated with exposure to surface residues resulting from smoking other legal and illegal drugs, such as tobacco and marijuana smoke, needs to be established. A comparison of risks associated with the residues from these two drugs and methamphetamine may reveal that the risks associated with the former are actually greater than the later. This information might be useful in educating the public about the potential health risks associated with former clandestine methamphetamine labs. **Estimated cost: \$40,000.**