GUIDELINES
FOR
CONTAMINATION REDUCTION

PROVEN PRACTICES

for the Cleanup of Clandestine Methamphetamine Laboratories

Acknowledgement

This document was compiled as an action item of Governor Rounds' Statewide Methamphetamine Task Force. The persons and agencies responsible wish to recognize all of the individuals, agencies, departments, and businesses from the states of Arkansas, Colorado, Missouri, Minnesota, Washington and others that have led the way with addressing the cleanup and remediation of clandestine methamphetamine drug laboratories. This document was made possible and completed only with the able work of those noted, the initiative of Governor Rounds and the active participation of the task force members and the agencies they represent.

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PREFACE

BACKGROUND

South Dakota has joined the states of Arkansas, Colorado, Missouri, Minnesota, Washington and many others with realizing the unfortunate and dangerous consequences associated with an increase in the number of clandestine methamphetamine laboratories, or "meth labs." Meth labs have been discovered both in rural areas and in this state's cities and towns. Discovery and investigation of these meth labs and the individuals operating them are handled by the South Dakota Attorney General's Office, Division of Criminal Investigation (DCI), in conjunction with the federal Drug Enforcement Agency (DEA) and with the full participation of local and tribal law enforcement organizations. Upon completion of a meth lab investigation by the DCI and DEA, trained hazardous waste professionals will then carefully identify, package and remove all of the chemicals, glassware, containers, and various stages of product from the structure to a secure area. At that point, the various chemicals are segregated according to reactive properties. These items are then processed and packaged for transport and disposal by a federal HAZMAT transportation contractor. This process is performed by trained hazardous waste professionals and is sometimes mistakenly referred to as the "initial cleanup," "primary cleanup," or "gross cleanup." The process is better defined as the "initial identification, processing and removal of meth lab evidence" and will be referred to as "initial processing" in this document. It would be a mistake to assume that any cleanup of indoor contamination has been performed.

Generally, methamphetamine is made by using a recipe, which may be handwritten or obtained from a publication, website, etc. The person manufacturing the drug literally "cooks" the ingredients. Hence these people are called "cooks" and the manufacturing process is known as "cooking" the drug. Production of methamphetamine in pharmaceutical laboratories under ideal controlled conditions results in the production of byproducts and contaminants which are removed, but in a clandestine laboratory those conditions do not exist. In addition to the normal byproducts, other unwanted byproducts may be produced during less than ideal conditions (e.g., overheating, under-heating, improper mixture, and boiling out). Though often found in small amounts, the human health risk becomes a concern when the residuals of the manufacturing chemicals, byproducts and the finished drug remain in the structure (home, apartment, storage shed, etc) after initial processing or are discharged into the environment (air, septic tanks, streams, and soil) during the manufacturing process.

Once a meth lab investigation has been completed and all chemicals removed, management of the building or property returns to the owner. Any subsequent cleanup becomes the responsibility of the property owner. This final stage of activity is often referred to as "secondary cleanup." Recognizing that no cleanup has actually taken place, this document will simply refer to the process as "cleanup."

PURPOSE

The purpose of this document is to provide information about the proven practices other states and businesses have successfully used during the cleanup of a meth lab prior to reoccupation of the structure. The information is intended to address the cleanup of meth labs after the site has been processed and released by law enforcement and to provide advice in cleanup of the contamination most frequently associated with illegal methamphetamine production. Because of

the constantly evolving methods of production this document will not address every possible situation. The information should be used as a guide to perform cleanup and not to be construed as regulations or rules subject to enforcement.

AUTHORITY

These cleanup guidelines are not mandated by the State of South Dakota. There is no statewide law that requires cleanup of meth labs, that stipulates the type of training or equipment required of those who clean them, provides funding for cleanup activities, or provides for the oversight of the cleaning process. However, the 2004 South Dakota Legislature did provide for authorities to require disclosure of knowledge of existence of prior manufacturing of methamphetamines in residential premises.

SDCL 43-32-30. Disclosure of knowledge of existence of prior manufacturing of methamphetamines

In any hiring of a residential premises, any lessor who has actual knowledge of the existence of any prior manufacturing of methamphetamines on the premises shall disclose that information to any lessee or any person who may become a lessee. If the residential premises consist of two or more housing units, the disclosure requirements provided by this section only apply to the unit where there is knowledge of the existence of any prior manufacturing of methamphetamines.

Source: SL 2004, ch 272, § 1.

SDCL 43-4-45. Disclosure of knowledge of existence of prior manufacturing of methamphetamines

In any selling of a residential premises, any seller who has actual knowledge of the existence of any prior manufacturing of methamphetamines on the premises shall disclose that information to any purchaser or any person who may become a purchaser.

Source: SL 2004, ch 272, § 2.

Repealed by SL 2005, ch 230, § 2. Included The requirement of SDCL 43-4-45 was included into the Seller's Property Condition Disclosure Statement (SDCL 43-4-44).

SDCL 36-21A-89.1. Commission to develop disclosure form regarding knowledge of existence of prior manufacturing of methamphetamines

The commission shall develop a disclosure form, to be filled out by the seller, regarding a purchaser's knowledge of the existence of any prior manufacturing of methamphetamines.

Source: SL 2004, ch 272, § 3. (See SDCL 43-4-44, Seller's Property Condition Disclosure Statement)

HEALTH HAZARDS

Some residents have asked whether building or room interiors are safe to inhabit after the meth lab chemicals and equipment have been removed during the initial processing. After the initial processing former meth lab properties should always be considered contaminated with the chemicals used to manufacture the illicit drug and with residue of the drug itself. In buildings where residual contamination is present, new occupants could unwittingly be exposed to hazardous materials. In general, young children are more likely to be exposed to the residuals of contamination because of behaviors such as crawling on floors and putting foreign materials in their mouths. Chemicals used during the meth manufacturing process will aerosolize or produce gases that can leave residues on the surfaces of walls and ceilings, in and around air handling equipment, and furniture, carpet, and draperies in the room. At the present time, there are no regulatory standards that identify a "health-based" safe-level of methamphetamine contamination that can be tolerated by persons who might occupy a dwelling that was previously used for illegal methamphetamine production.

Some chemicals used in methamphetamine production present a danger of injury from fire or explosion and deadly gases. In addition, at the lab site there are possible risks of exposure to infectious disease (e.g., AIDS, hepatitis B) in the event of skin puncture by undiscovered sharps or other open wound contact with unseen blood-borne pathogens. Risk of injury or toxicity from chemical exposure is present, depending on the toxic properties of the chemicals, quantity and form, concentration, duration, and route of exposure.

EXPOSURE ROUTES

Inhalation and/or skin exposure are the most likely routes of exposure of persons exposed to the drug lab environment. The cook has the potential of toxicity from all routes of exposure (i.e., ingestion and injection of the drug, spill of chemicals onto the skin, and inhalation of vapors). Children living in the drug lab environment typically are in contact with the floor, thus have a higher potential for exposure because of the possibility of ingesting chemicals in addition to inhalation or skin exposure. The greatest threat to the life and safety of individuals are to those individuals within the confines of a building where and when methamphetamine production is underway.

Inhalation or skin exposure may result in injury from corrosive substances, with symptoms ranging from shortness of breath, cough, chest pain, and burns to the skin. Many solvents are absorbed into the body through the lungs and if the dose is sufficient may cause symptoms of intoxication, dizziness, lack of coordination, nausea, and disorientation. The skin, to a lesser extent, may also absorb some solvents if chemicals remain in direct contact. Ingestion of chemicals will result in the greatest risk of toxicity.

The final methamphetamine product has considerable potential for adverse effects in the drug user. Toxic properties of the drug may cause agitation, psychosis, seizures, respiratory arrest, and death. In addition, drugs produced in clandestine meth labs contain an abundance of contaminants and byproducts which do not have predictable effects on the drug user. Impurities found in some drugs produced in meth labs have resulted in severe and permanent neurological disabilities following intravenous injection. As state and federal agencies reduce the availability

of precursors by regulation and enforcement, it can be anticipated that the cook will resort to more exotic methods of production, resulting in the creation of contaminants and byproducts with unexpected and potentially adverse effects to the drug user.

EXPOSURE RISK

The risk of human exposure varies considerably depending on the lab process, quantity, and form of chemicals. Also, there is greater risk of chemical exposure at a site where a lab is actively producing drugs than at a site where drugs were formerly produced and in the area of the cooking process in structures where the drug was formerly produced than in other non-production areas of the structure.

The potential for exposure to meth lab residues on surfaces and porous articles depends upon:

- 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 residential building will likely be contacted more frequently than residues in non-residential buildings.
- Ability of volatile residues to become airborne. Residues in residential buildings with ventilation systems may be dispersed by the system throughout the building.
- Characteristics of the inhabitants or users of the contaminated site. Toddlers who crawl on contaminated carpet or floors will have high frequency of skin contact to toxic residues over a considerable area of skin. These residues may directly irritate the skin, and may also be absorbed into the body through the skin. If hand to mouth behavior occurs when hands have been in contact with toxic chemicals, these will be ingested into the body. Hand to eye behavior will introduce toxic materials to the eyes. Toddlers are at greatest risk for hand to mouth and hand to eye behaviors, but all people exhibit them.

RISK - ACTIVE LAB

A functioning meth lab presents the greatest risk of adverse health effects for occupants. If a site is found to be an illegal drug manufacturing site and is supplied with chemicals and lab hardware, it should be considered unsafe for entry except by trained personnel using appropriate personal protective equipment.

Danger of fire and explosion comprises the greatest risk due to the types of solvents normally found at these sites. A chemical spill could result in air concentrations strong enough to produce symptoms from inhalation of solvents, corrosives, or cyanide. The drug cooking process could also generate sufficient amounts of toxic gases to produce symptoms. The levels of airborne chemicals will vary considerably depending on the cooking method, quantity of the chemicals present, size of the room, and ventilation. Another potential risk of toxic exposure to the untrained occurs as a result of the cook setting “booby traps.”

Acute injury with immediate onset of symptoms from chemical exposure is the most significant health risk related to the manufacturing of illegal methamphetamine. Although the risk of acute injury is possible from exposure to chemicals at an active lab site, the risk of chronic toxicity or cancer has been reported as remote.

RISK - FORMER LAB

After removal of the illicit laboratory equipment and chemicals, residual amounts of some substances may persist on building surfaces and furnishings prior to cleanup. Substances present in the active lab such as gases or volatile solvents should dissipate rapidly with ventilation, unless there has been a significant spill and a residual pool of liquid remains.

Because of the great uncertainties involved in estimating the risk posed by chemical residues (determined by exposure and toxicity) from methamphetamine laboratories, a level of .1 microgram of meth residue per 100 square centimeters ($ug/100cm^2$) of surface area has been chosen as the desired cleanup level.

PREPARATION FOR CLEANUP

EVACUATION

Evacuation of a meth lab site or structure will generally be required at the time of seizure but may possibly be extended following assessment by an environmental contractor. After a site has been secured and no longer subject to criminal investigation, appropriately trained and equipped personnel may be hired to cleanup any remaining contaminated materials before anyone is permitted to reoccupy the structure. In most cases, cleanup and evaluation activities should be performed by contractors with expertise and experience in the cleanup of hazardous materials.

The contractor should notify the local law enforcement agency if lab remnants or other evidence of illegal activities are discovered that may have been overlooked during the initial processing activities.

CLEANUP CONTRACTORS

The State of South Dakota has no established mechanisms to evaluate, certify or license persons or companies that would perform clandestine drug lab cleanup activities. Persons who are responsible for selecting a cleanup contractor should use the same diligence that they would when choosing someone to perform any professional service. Because of the serious hazards posed by the materials in meth labs, it is necessary to ensure that cleanup activities are conducted safely and in accordance with applicable environmental and health requirements. It is herein recommended that personnel engaged in cleanup activities have: at least the 40-hour HAZWOPER (Level 1) training (40-hour Safety and Health Training for Hazardous Waste Site Personnel); plus experience in hazardous waste site cleanup or specific training in meth lab cleanup. It is also recommended that meth labs be cleaned by contractors who are trained and equipped to conduct hazardous chemical cleanup. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) standards and other applicable safety measures should be observed by workers engaged in meth lab cleanup. Pertinent OSHA Personal Protective Equipment (PPE) standards may be found in 29 CFR; Part 1910.120.

The State of South Dakota does not recommend any particular cleanup company but the Department of Agriculture and Natural Resources (DANR) does maintain a list of contractors that have indicated their availability to perform meth lab cleanup activities in South Dakota.

EVALUATION OF CONTAMINATED AREAS

The first step in the cleanup process is to evaluate the site where the actual methamphetamine manufacturing activities had been ongoing. An evaluation should determine what chemicals are involved, the manufacturing method, and whether the property is fit or unfit for use as is. Obtaining available copies of any reports, diagrams of the site, lists of chemicals and equipment confiscated from the site and any other documents generated by law enforcement personnel, HazMat Team members or the hazardous waste removal contractor can aid in the evaluation process. DANR may be able to assist with this process (provide technical assistance: proven practices; lists of cleanup contractors; and analytical laboratories). Information obtained from these documents will help to identify:

- Area where the processing or cooking occurred. Items and areas affected may include floors, floor coverings, ceilings, walls, draperies, furniture, countertops, appliances, containers, plumbing fixtures and heating, ventilation and air conditioning (HVAC) systems;
- Areas where chemicals and equipment were stored. Indoor contamination may have resulted from spills, leaks, and/or vaporization from open containers;
- Areas where chemicals and waste were disposed. Inside a building, these areas could be sinks, toilets, floor drains, or bathtubs as well as associated plumbing;
- The chemicals found on the property and the quantities of each chemical;
- The method(s) used to produce the methamphetamine or its precursor chemicals; and
- Determine if pre-clean sampling is necessary.

The noted documents should be reviewed before the on-site visual inspection is performed and should be used to aid in the development of the site-specific evaluation strategy. The hazardous materials inventory generated by law enforcement during the initial processing phase can be helpful but it should not be considered a complete list of all hazardous materials that might have been at the site. A list of chemicals and products commonly associated with the manufacture of methamphetamine is available in Attachment A of this document.

NOTE: If mercury or lead were determined to be used during the meth manufacturing operations (not typically used in current "popular" processes) the cleanup guidelines contained in this document will not be satisfactory for remediation activities. The structure should be vacated, and DANR notified. Do not begin cleanup activities.

The State of South Dakota has established rules requiring responsible persons to report releases and suspected releases of regulated substances, including petroleum products. These rules also establish "reportable quantities" and time frames for reporting known and suspected releases. The rules pertaining to reporting releases and suspected releases are contained in Chapters 74:34:01, 74:56:01, and 74:56:03 of the Administrative Rules of South Dakota (ARSD); and in Chapters 34A-2 and 34A-12 of South Dakota Codified Law. To obtain information that has been provided to DANR or to report a release of a regulated substance, call 605-773-3296 during regular office hours (8a.m. to 5p.m. Central time, M-F). To report the release after hours, on a weekend or holidays, call the Office of Emergency Management Duty Officer at 605-773-3231.

If it is determined during the evaluation that the property is fit for use, the findings should be documented and archived for future use. The documentation should include: findings, conclusions, the name of the owner of record, his/her mailing and street address, legal description of the property, and clear directions for locating the property. Cleanup related documentation should be retained by the property owner for verification of activities, as required.

If it is determined during the evaluation that the property is unfit for use, the site should be posted, a cleanup protocol developed in accordance with these guidelines, the cleanup implemented and verified with post-cleanup sampling of surfaces for volatiles, corrosives, and methamphetamine residue.

AIRING-OUT (VENTING) THE BUILDING

Before persons are allowed to enter the property to perform evaluation activities, the property should be ventilated for a least a full day to reduce or eliminate the concentration and odors of volatile solvents or other chemicals that may have soaked into the interior surfaces or furniture and are slowly entering the air. Venting of contaminated air to the outside should be directed away from occupied areas or the air intakes of adjacent buildings. The building's heating, ventilation, and air conditioning (HVAC) system should never be used to vent potentially contaminated air from the building. The distribution of gases and aerosols can be extended by a building's HVAC system and vapors could therefore be further distributed throughout a single or multi-dwelling complex. Windows should be opened and exhaust fans should be set up to circulate air out of the structure. If possible, air should be pushed out rather than pulled out so that contaminated or potentially volatile air does not pass through fans.

Note: Venting will not remove residues and is not a cleanup method.

After the initial airing-out, ventilation should be continued throughout the cleanup except when venting may impede evaluation. Care must be taken that vented contaminants are exhausted to the outdoors and not to the air intakes of adjacent structures. This is especially important when using methanol or other solvent materials to clean surfaces. Use of respirators may be required if adequate ventilation cannot be obtained.

The indoor ambient air quality could be evaluated with a photo ionization detector (PID) to detect the presence of volatile organic chemicals commonly used in manufacturing. A sweep through the entire building should be made with an accurate record kept of all readings in every room. Additionally, septic system drains (floor, tub, sinks) could be probed to determine if any chemicals have accumulated in the drain pipe.

INITIAL WALK-THRU VISUAL INSPECTION

The primary purposes of initial walk-thru visual inspections are to: (1) determine or verify the physical layout of the property; (2) gather information about the locations and descriptions of interior surfaces and furnishings; and (3) identify and document any visible signs of contamination. All indoor rooms in which methamphetamine-manufacturing activities were performed or adjoining rooms should be assessed individually to determine which room will require cleanup and the extent of that cleanup.

The information needed to determine the physical layout of a property includes: the number of rooms, the approximate size of each room, the locations of the rooms; how each room is interconnected to adjoining rooms and the likely function of each room (i.e., kitchen, bedroom, storage room). A map should be generated to assist in determining a cleanup plan. On that map, the location of appliances, worktables, doors, and air vents should be noted. For each separate room, photographs should be taken to aid in characterizing the room. Additionally, the type of wall coverings, floor coverings and ceiling composition should be noted for each of the rooms.

As part of the visual inspection; any discolored, stained, degraded, or burned surfaces and/or items should be noted. There may be areas of possible contamination not directly involved with the methamphetamine manufacturing activities such as common-use areas in dwellings such as

apartments and hotels. Remember, volatile chemicals and/or airborne particulates can migrate through walls or through common utilities such as HVAC systems or plumbing. The vapors produced by methamphetamine manufacturing deposit particulate residue (including methamphetamine) on surfaces. Levels of meth residue are used as an indicator of surface contamination in this document.

TOXIC RESIDUES

The toxicity of the meth lab residues will depend upon the amount of the residue and the chemicals in the residue. The amount of residue will depend upon the size of the meth lab, the length of time it operated, methods of chemical storage and disposal, occurrence of chemical spills, as well as on the physical characteristics of the structure in which the meth lab operated. The chemicals found in the residue will vary with the method of methamphetamine manufacture and controls utilized during the process.

Powders and liquids spilled throughout the structure should be tested to determine their corrosiveness, toxicity, and flammability. pH paper with de-ionized water should be used in all suspect locations. An accurate record of findings should be made.

Acids should be neutralized with sodium bicarbonate (baking soda); and bases with weakly acidic wash solutions (e.g., vinegar, citric or acetic acid). Solids can be scooped up and packaged for proper waste disposal in accordance with the solid waste rules [Administrative Rules of South Dakota (ARSD) 74:27]. *Working with corrosives can be dangerous for persons unfamiliar with their properties.* pH paper should be used to check a surface after neutralization.

AREAS OF NO VISIBLE CONTAMINATION

In portions of the structure away from cooking areas where no visible staining or contamination is present, testing may exclude the need for any cleanup. If pre-cleanup testing is not chosen, rooms and surfaces that are smooth and easily cleanable should be HEPA-vacuumed and then twice-washed with a standard detergent solution and rinsed.

Note: Special care should be taken throughout the evaluation processes to note and sample high-traffic areas and pathways such as hallways to and from cooking areas, and between chemical storage and cooking areas. High-traffic floors and carpeting often reveal high levels of contamination even when removed from the cooking area.

CLEANUP

DEVELOPMENT OF A WRITTEN CLEANUP PLAN

Before beginning cleanup activities, a written plan should be developed to give workers step-by-step instructions on how to proceed. This plan should address worker safety, adhering to Occupational Safety and Health Administration (OSHA) regulations and guidelines. The written plan should also address the proper handling and disposal of potentially contaminated materials.

Note: All discarded materials should be disposed of in permitted landfills that are authorized to receive such materials in accordance with the ARSD 74:27. Cleanup contractors should check with the landfill to ensure proper disposal.

The sequence of activities in the written plan should be:

1. Remove all items that will be cleaned off-site.

2. Remove all items and building materials that have been identified for disposal.

3. Wash all surfaces, starting from the area of highest probable contamination (actual area where methamphetamine was manufactured or chemicals were stored) and progressing out toward the areas of least likely contamination.

4. Take surface wipe samples and analyze for the presence of methamphetamine or any other contaminant that could be realistically used as a measure of the effectiveness of cleanup.

5. Replace discarded materials such as carpeting or drapes only after it has been determined that cleanup efforts were adequate.

This written plan should be approved by the responsible parties such as the property owners or their representatives and the cleanup contractor. Approval should be given in writing such as signing and dating an approval sheet that is attached to the plan. A complete copy of the approved written plan should be available to all personnel at the site.

DISPOSITION OF CONTAMINATED MATERIALS

Even when using chemical inventory lists generated by law enforcement, it is unlikely that all of the chemical used in the manufacturing process will be identified. Therefore, all visibly stained, discolored or etched fixtures such as sinks, bathtubs and toilets should be removed and replaced. All absorbent materials such as carpeting, drapes, furniture, furnishings, clothing, wallpaper, and paper items should be evaluated to determine if they could be HEPA-vacuumed and cleaned with soap and water. If there is any doubt as to the effectiveness of soap and water cleaning, these items should be disposed of. If an item retains staining or chemical odor even after it has been cleaned, then it is recommended that it should be considered contaminated and disposed of as such. Any absorbent building materials such as insulation or plaster or sheetrock should also be removed and replaced if they are stained and are emitting a chemical odor. All contaminated materials should be wrapped and sealed before they are removed from the site to avoid spreading

the contamination to unaffected areas. Decisions could be made on a cost-benefit basis when obvious contamination does not exist.

CLEAN STORAGE AND CLEANED AREAS

An area far from the drug cooking area can be cleaned and then serve as a storage area for any portable items cleaned during cleanup. The doors and openings to these areas should be cordoned off with heavy mil plastic (4-6 ml) to avoid recontamination during further cleaning of the site.

ITEM SPECIFIC INSTRUCTIONS

When a contractor is asked to remediate furnishings or provide advice about safety of these items, the following may apply:

- Clothing, Household Items, and Other Fabric Items: Washable fabrics, including clothing linens, and soft items, except those with obvious chemical staining or contamination, can generally be machine-washed twice with hot water and detergent.
- Dishes, Flatware, and Other Hard (non-porous) Household Goods: Washable household items, including ceramics, hard plastics, metals and glass, may be washed and rinsed twice using hot water and detergent. Any item that shows evidence of having been used in the cooking process (acid etching or chemical staining) should be discarded.
- Household Items Made of Wood and Wood-like composites: Cleaning of these generally porous items may be dependent on the finish and ability of the item to be detergent washed, as well as on considerations of value, and potential contamination. Such items, if considered cleanable, should be washed and rinsed twice, and possibly coated with an oil-based finish, depending on the degree of contamination.
- Upholstered Furniture: Disposal of these items is the preferred option. Cleaning of upholstered items that are not discarded due to obvious contamination will usually consist of vacuuming using a machine equipped with a HEPA filtration system, followed by hot water detergent scrubbing and extraction.
- Household Books and Paper Items: Paper items are extremely porous. Any paper items near the area of a known lab should be discarded. Paper goods stored in filing cabinets, closed bookcases or cupboards in rooms where wipe samples show low levels of contamination should be salvageable. Given the uncertain history of most lab sites, disposition of such porous materials should err on the conservative side.

POROUS, SEMI-PERMANENT FURNISHINGS

Absorbent materials can accumulate vapors that are created and dispersed during the cooking process, or can collect dust and powder from chemicals used in drug manufacture. Professional judgment and information from the preliminary evaluation must be applied to decisions regarding the cleaning or removal of these goods.

Disposal of these items is the preferred option. If chemical odors are present, or porous materials show signs of spillage or discoloration, they must be discarded. For costly items (e.g. new or expensive carpeting and draperies), cleaning may be an acceptable course of action, particularly in a short-term lab, or in rooms where sampling indicates no or low levels of contamination. In

areas of moderate to high contamination, these goods should be discarded. Decisions, actions taken, disposal sites and methods should be documented as part of the Written Cleanup Plan.

Cleaning of porous materials that are not discarded will usually consist of vacuuming using a machine equipped with a HEPA filtration system, followed by (at least one) hot water detergent scrubbing and extraction. For non-washable materials such as lined curtains, when those materials are not heavily contaminated, dry-cleaning is permissible (with the concurrence of the dry-cleaner).

In areas of mild to moderate contamination, pre-testing should not be necessary, if the cleanup protocol includes thorough detergent cleaning. It is rarely cost-effective to pre-sample such items in order to justify their disposal. However, if property owners wish to avoid cleaning or disposal of goods, testing should be required. In such cases, a sample of fabric may be needed for laboratory analysis. Contact the analysis laboratory of choice for sampling instructions.

HOUSEHOLD APPLIANCES

Appliances, such as refrigerators and stoves that show visible contamination or are suspected to be contaminated and have insulation or other inaccessible parts should be removed and discarded in an approved manner.

Appliances can be evaluated on a case-by case basis, with attention to: 1) site type (e.g., residence, rental, storage facility); 2) use during drug manufacture (e.g., chemicals stored in refrigerators or cooked on stoves); 3) use in the home (e.g., washer/dryer vs. refrigerator); 4) ability to be cleaned (accessible interiors vs. non-accessible); and 5) cost benefit of disposal vs. cleaning.

PLUMBING FIXTURES, SEPTIC AND SEWER SYSTEMS

Sink, bathtub, and toilet drains are frequently used for the discharge/disposal of used lab chemicals. Etched and stained fixtures may indicate the need for decontamination of the system as chemicals and contaminated wastes can collect in drains, traps and septic tanks and may give off chemical fumes. A photoionization detector (PID) may be used to assess volatile organic compounds (VOCs) in plumbing. Porcelain and stainless steel, unless pitted or damaged can be successfully cleaned as with the case of other hard nonporous surfaces. However, visibly contaminated (etched or stained) fixtures should be removed and properly disposed.

If staining or presence of VOCs indicates dumping into municipal sewer systems, household plumbing should be aggressively flushed. The appropriate wastewater management authority should be contacted and advised of the presence of an illicit drug laboratory.

If the dwelling is served by a septic system and the tank liquid is believed to be contaminated, the contractor should utilize best practices for septic tank sampling activities. A contractor should never enter a septic tank for assessment or sample collection without the expertise to safely and effectively perform the task. For additional information refer to the topic Septic Tank Sampling in these guidelines. Plumbing fixtures, such as sinks and bathtubs may have to be discarded if surfaces are permanently affected by acid etching or other chemical damage.

CLEANING WITH DETERGENT AND WATER

Hard interior surfaces such as walls, tile and wood flooring, ceilings and paneling; and hard surfaced furniture or appliances can retain contamination from the meth cooking process, especially in those areas in and adjacent to areas where the cooking and preparation took place. Analyses of wipe samples of hard surfaces will indicate levels of contamination on those surfaces and may also be the best indicators of the contamination in adjacent fabrics and other soft furnishings.

In the absence of sampling, interior surfaces should generally be twice scrubbed using a standard detergent solution (contractors have advised using Simple Green or (TSP) Trisodium Phosphate) and then rinsed with clear water. Methanol cleaning has been shown to be more effective in some situations, such as on countertops and stoves which will not be painted. Staff using methanol must always be trained to use the chemical, wear appropriate PPE, and remove methanol traces completely.

All nonporous and semi-porous surfaces (floors, ceilings, countertops, etc.) should be examined for signs of staining or deterioration that could indicate chemical contamination. If there is no visible evidence of contamination, nonporous surfaces should be thoroughly cleaned with a detergent and water solution. Heavily contaminated surfaces such as walls, paneling and ceilings that cannot be removed should be washed with detergent and water, thoroughly dried and then painted with an oil-based paint, epoxy or some other material that would create a physical barrier to prevent volatilization or out-gassing of contaminants (see Encapsulation).

Surfaces that cannot be cleaned with detergent and water can often be dry vacuumed with a HEPA filtered vacuum. Used HEPA filters should be properly disposed of.

It is likely that contaminants will be washed off during the detergent and water washing process. Therefore, the used wash water should be tested for levels of representative contaminants and disposed of in accordance with federal, state or local regulations. The chemicals chosen for analysis should be based on chemicals listed by law enforcement as part of their chemical inventory found at the site. Generally, wash water can be disposed via the wastewater system, but if it contains decanted or spilled chemicals, it should not be disposed of in a septic system. Contact the local wastewater treatment facility before disposing of any decon wash-water within a wastewater system.

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 counter tops; stained and etched furniture and plumbing fixtures.

ENCAPSULATION

When indicated by pre-sampling or other evaluation procedures, and in areas of high contamination, interior surfaces should be coated with an oil-based paint, epoxy or polyurethane coating after scrubbing. Latex paints may require multiple coats to achieve suitable coverage. If surfaces (e.g., ceiling tiles, sprayed ceiling) cannot be scrubbed, the contractor must use best professional judgment (plus testing and assessment information) to decide whether painting will be sufficient. Spray painting is recommended where possible.

When paint or another physical barrier is applied, the encapsulate should be allowed to dry for the time stipulated by the manufacturer. Complete coverage may require more than one coat. These areas should be monitored and the barrier maintained to assure the contamination is contained. If staining, odors or discoloration appear after the coating dries, removal and replacement of that surface section may be necessary.

NOTE: Painting by the cleanup contractors may be neither practical nor cost-effective. This work may be done by owners or their painting contractors, after clearance by the cleanup contractor. Final sampling should be conducted after paint is thoroughly dry and the structure vented of paint fumes.

CLEANING THE VENTILATION SYSTEM

One of the major routes for carrying contaminants from one area of a structure to another is through the ventilation system. The vents, ductwork, filters, and/or walls and ceilings near ventilation ducts can become contaminated and the ventilation system itself is likely to contain residues of chemicals used to manufacture methamphetamine and/or methamphetamine itself. If assessment information or visible contamination indicates the ventilation system is compromised, it is recommended that all filters in the system be replaced, all vents be removed and cleaned, all ductwork be cleaned and surfaces adjacent to or near the supply air and return air vents be cleaned.

Any ventilation system that is constructed of non-porous material such as sheet metal or the equivalent may be HEPA-vacuumed. The system should then be washed down to arms length with an appropriate grease cutting soap or detergent, repeating two additional times. All filters should be replaced and properly discarded. Plastic ductwork, if readily accessible, may be removed and replaced. If inaccessible, HEPA-vacuum, wash and rinse as noted above.

Ducts constructed with an internal lining of reinforced fiberglass should be carefully HEPA-vacuumed at least to arm's length (further, if visible contamination indicates this is necessary). If supply air diffusers cannot be easily cleaned, it may be more cost-efficient to replace them. Post-cleanup testing of the site with the ventilation system operating can be used as verification of effective decontamination.

If after cleaning, wipe samples indicate high levels of contamination, spray sealing with a non-flammable epoxy-type sealant may be considered. Vent sealing is a cleanup measure that is sometimes used after a structure has been contaminated by fire, and may be appropriate for some lab sites.

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 writing the cleanup and testing portions of the work plan. One strategy is to take samples from adjacent or connected areas/rooms/units, working outward from the lab site until samples show low levels or no contamination.

It is recommended that sampling for methamphetamine levels be used as the indicator of toxic chemical contamination that might be harmful to occupants. Generally, if the meth level

indicates a need for cleaning and the suggested cleaning is performed, other related chemical residues will be removed or lowered during the process.

FINAL VENTILATION

Final ventilation, after cleanup, is recommended. After the cleaning and final airing out, the property should be checked for re-staining and odors. These signs would indicate that the initial cleaning was not successful and further, more extensive steps should be taken.

EXTERIOR CONTAMINATION

The exterior of the structure should be inspected for evidence of contamination. Liquid and solid waste materials are often dumped into the toilet, bathtub, or floor drain; dumped outside of the structure, buried, or burned. Where waste materials are dumped, soil and ground water contamination threats exist.

In rural areas, septic tanks and drinking water wells can become contaminated. The extent and magnitude of the contamination problem is often determined by the size of the cooking operation and/or how long cooking has been taking place. The larger or longer an operation has been running the more waste is produced. On average, a single "cooked batch" of methamphetamine will yield one half gram of drug and generate about two (2) gallons of chemical waste.

Burial of waste is not very common but does occur. Burn pits or barrels are fairly common and are used to reduce the volume of waste liquid and solids. Additionally, chemical containers are often stockpiled on the property because discarding them in the common trash may arouse suspicion. These stockpiles of containers may also prove to be a source of contamination.

The Department of Agriculture and Natural Resources (DANR) is the lead state environmental regulatory agency for determining exterior environmental impact. If soil, air, or water contamination is indicated by staining (discoloration) of soil or dead vegetation, large burn piles or dump areas, or signs of dumping in a well or septic system, DANR should be contacted for evaluation of the situation and determination of response.

EVALUATION OF STRUCTURES FOLLOWING CLEANUP

After the completion of cleanup and decontamination activities, the site should be visibly re-inspected to determine if signs of contamination are still visible. If there are no visible signs of contamination remaining, surfaces that have been cleaned should be sampled to determine if residues of chemicals used to manufacture methamphetamine or methamphetamine itself are still present.

The contractor should prepare a final report, including written documentation that verifies: the work proceeded in accordance to the Written Cleanup Plan; and that contamination was reduced to desired levels based on best practices, available guidance, and the professional judgment of the contractor. Property owners and/or others contracting meth lab cleanup services should also be encouraged to provide a copy of the final report to DANR and DOH so that the completion of the work will be noted in any databases that may be developed.

POST-CLEANUP SURFACE SAMPLING FOR METHAMPHETAMINE

The most practical and reasonable strategy for measuring the effectiveness of decontamination is to test for residues of methamphetamine on surfaces after the completion of removal and cleaning activities. In an effort to determine a level of methamphetamine at or below which the cleanup process could be considered adequate for the protection of persons who would subsequently reoccupy the structures, the South Dakota Statewide Methamphetamine Task Force's subcommittee for Law Enforcement and Environment evaluated the cleanup standards and guidelines used by other states. The cleanup levels for methamphetamine ranged from 5.0 ug/ft^2 to 0.1 ug/100cm^2. The level of .1 ug/100cm^2 is most commonly used. The Department recommends sampling for residual methamphetamine as a practical surrogate for determining adequacy of cleanup. *It is recommended that .1 micrograms of methamphetamine residue per 100 square centimeters (ug/100cm^2) of area sampled be used as the acceptable post-cleanup re-occupancy level for a structure that had been used as a clandestine methamphetamine laboratory, until such time that a national health-based standard is determined.* This level is reasonably achievable and sufficiently conservative considering the lack of adequate scientific information about the adverse health effects associated with long-term exposure to low levels of methamphetamine. It is believed that the cleanup procedures necessary to decrease the levels of methamphetamine to .1 ug/100cm^2 should also be adequate to reduce the concentrations of other meth-related chemicals to acceptable levels.

SAMPLING STRATEGIES

Quality assurance and quality control in clan lab sample analysis does not begin in the laboratory. Without the proper controls in place prior to analysis, testing may be performed on non-representative, improperly collected, mislabeled, or improperly stored samples. Inaccurate results, potential harms and additional costs are some of the ramifications of a poor sampling strategy.

Care should be taken to:

- Determine the quantity of samples and sampling sites with careful consideration of obvious contamination, and reliability/completeness of information about site history prior to seizure. Consider: how long cooking operations have taken place, where the cooking operations were located, and the structure of the ventilation system for the building (re: distribution of residue).
- Collect samples in a uniform manner, as directed by the analysis laboratory of choice, using approved equipment and methods; and changing gloves with each sample.
- Label samples accurately. Seal, store and provide documentation according to instructions given by the analysis laboratory of choice.
- Keep samples clean and dry. Store samples in a cooler. Protect the cooler from excessive heat or cold. Deliver samples to the laboratory within the required period of time.

Sampling strategies may vary depending upon: (1) information from the site evaluation; (2) the chemicals and methods used in the manufacturing processes; (3) the visual extent and severity of contamination; and (4) the best judgment of the professional conducting the inspections. If pre-cleanup sampling data is available and the information indicates that levels of contamination are low or that the areas sampled are not contaminated, then these areas may not require cleanup. Areas of obvious visual contamination or areas which were involved directly with manufacturing activities should always be sampled after cleanup. Post cleanup sampling may not be required in areas where contamination was deemed to be light and adjacent sampling showed no residual contamination.

When testing the air for volatile organic chemicals, be aware that some chemicals used in the manufacture of methamphetamine may also be common ingredients found in household chemicals. The presence of such volatiles in the air does not necessarily indicate the presence of contaminants associated with methamphetamine manufacturing. Considering the potential problem of background interference and the high cost of collecting air samples and analyzing them, air monitoring inside a structure may not be the practical approach to determining the effectiveness of a cleanup process. The Governor's Statewide Methamphetamine Task Force recommends that wipe samples be taken post-cleanup to determine the presence and amounts of chosen chemicals on cleaned or presumed uncontaminated surfaces. A typical wipe sample protocol can be found in ATTACHMENT B of this document. When developing a sampling protocol, the laboratory that will be analyzing the samples should be able to provide protocols that are compatible with their testing methodologies.

SAMPLING GUIDELINES

The primary sampling methodology for lab cleanups must reference standard U.S. Environmental Protection Agency (EPA) methods or equivalent established methods as established by the analysis laboratory of choice. A sampling plan should be developed with input from local public health officials and law enforcement agencies to ensure that an adequate scope of sampling is achieved based on specific information available about the individual lab site.

Decisions regarding the sampling plan can be made based on the evaluation information, chemicals used and duration to lab operation, and professional judgment. Variations on the pretest, clean, post-test design may include the following considerations:

- As a rule, pre-cleanup sampling will not be necessary. Exceptions may be made, for example, when a stakeholder (insurance company, bank or property owner) wishes to prove contamination prior to cleanup, or when it is believed that pre-sampling will reduce overall cleaning costs.
- Cleaning may not be required, when pre-cleaning samples indicate low levels or no contamination in some areas.
- In areas of moderate to heavy contamination, cleanup may be carried out without previous sampling.
- In areas of obviously mild contamination, cleanup may be done without post-cleanup sampling, based on best judgment and adjacent sampling results.

After cleanup and encapsulation, only small amounts of residual chemicals should remain (see Attachment C). In cases of moderate to heavy contamination, indoor air should be screened with a PID or similar instrument after cleaning to determine that the lab has been cleaned to reasonable background levels.

The primary chemicals of concern are the drug manufactured (meth), solvents, lead and mercury. For many drug lab chemicals there are no existing numeric standards. Therefore, the Governor's Statewide Methamphetamine Task Force recommends using the cleanup limits and guidelines based on best judgment and current practice (see attachment C). Data on lab samples must be reported as ppm for VOCs, as ug/cm^2 for surface samples, and as ug/m^3 for air samples.

GENERAL PROCEDURES FOR SAMPLING

EVALUATION OF CORROSIVES

Corrosive residues and spills may occur in drug preparation and manufacturing areas; in places where chemicals have been stored, and in other areas of a lab site. pH paper with de-ionized water should be used in all suspect locations. pH measurements can be completed using de-ionized water and high quality pH test strips providing reasonable visual determination in the range of 6-8. Several milliliters of water should be applied to the surface, allowed to stand for 3 to 5 minutes, and then tested with the strip. An accurate record of findings and locations must be completed.

WIPE SAMPLES FOR METHAMPHETAMINE CONCENTRATIONS

The sampler must wear gloves to avoid contaminating samples. Prior to sampling, a clean glass sample vial containing a cotton gauze pad, pre-soaked in methanol, should be labeled with a sample number, date, time, location and the sampler's ID or initials. The methanol wipes are used to determine if methamphetamine residue exists on the surface to be tested.

Discrete (separate) samples are taken from separate a one-hundred square-centimeter area. Areas can be measured with a ruler and marked by using tape, chalk, or some other non-permanent marking tool. The methanol-soaked gauze pad (supplied by the laboratory of choice) is used to wipe the surface to be tested. To sample the marked area, complete a wiping motion over the entire area horizontally (side to side) using only one side of the gauze, and completing a least 5 swipes from left to right. Turn the gauze over to expose a clean side and then complete a wiping motion over the entire area vertically (up and down) at least five times. The pad should then be rolled into a cylinder and secured in the glass vial. For additional instructions see Attachment B.

Samples should be analyzed by a laboratory that specializes in the evaluation of drug lab residue testing. Laboratory reports should include methods, QA/QC, and detection limits.

OUTDOOR SAMPLING INFORMATION

Outdoor contamination will typically be addressed during the activities of the initial cleanup process that occurs at the bequest of law enforcement and is completed by contracted hazardous waste cleanup professionals. However, because each meth lab presents unique circumstances and evidence-gathering activities may not include the outdoor areas or in the event outdoor contamination is not discovered until the cleanup process, cleanup contractors may be involved with some outdoor site contamination. Outdoors sampling and evaluation may be appropriate when contamination is evident (e.g., browned or patchy vegetation with accompanying ammonia or petroleum odor; burn pit with chemical containers).

The South Dakota Department of Agriculture and Natural Resources (DANR) and other appropriate regulatory agents (e.g., local environmental agency) should be notified and consulted regarding the evaluation of outdoor locations. DANR maintains a listing of trained and experienced environmental contractors that can be provided to the property owner or their contracted representative.

SOIL SAMPLING

Soil samples should also be collected from suspected sources of outdoor contamination. Decisions regarding sampling location and depth must be made based on the circumstances of the site. Samples should be placed in a clean glass jar, filled to the top to minimize head space, secured with a septum lid or suitable alternative as accepted by the analytical laboratory. Each container should be labeled with date, time, sample location, and kept cool. Specific analytical methods used will depend on the chemical contaminants suspected to be present.

SEPTIC TANK SAMPLING

The most common types of contaminants expected to be discharged in septic systems associated with meth labs are: solvents (e.g., toluene, xylene, alcohol, acetone); petroleum distillates (e.g., paint thinner, camp stove fuel); liquid corrosives (e.g. sulfuric acid, muriatic acid, sodium hydroxide solutions), and mixtures with residual ephedrine, methamphetamine, iodine or red phosphorous.

Sampling should be performed when there are reasons of concern about dumping of meth lab chemicals into a septic system. Reasons for concerns may include: witness statements; stained or etched sinks, bathtubs, toilets; chemical odors coming from the septic system plumbing or tank; and visual observations of unusual conditions within the tank – “dead tank” (pH too high or low has killed the bacteria in the tank), stressed, or dead vegetation in the drain field.

Samples should be representative of the wastes found in the septic tank. Normal sampling procedures will include the use of drum thieves, sludge judges or equivalent equipment. It is highly recommended that the services of a septic system professional (septage hauler) be employed.

Septic tank wastes will typically not qualify to be designated as listed hazardous wastes because the solvents have been used and there is too much uncertainty about the types, sources and original concentrations of solvents discovered in septic tanks. The typical household septic tank will have wide-ranging pH values (5 – 8) and most chemicals used in meth production are common household chemicals. However, care should be taken to assess the presence of dangerous conditions before offloading/pumping out the tank for processing. Therefore, suspect septic tanks should be tested for pH and solvents using a suitable analytical method.

Based upon available information, septic tank wastes will typically not designate as ignitable hazardous waste. However, under severe conditions, there may be a floating layer of solvents in sufficiently high concentrations that it represents a fire or explosive hazard. Septic tank workers should employ care when accessing the tank and as a protective measure, should "vent" the "scum layer" while ensuring that no open flame or other ignition sources are near the area until such time that the VOC level can be ascertained as safe for handling. The responsible person should work with the local fire department or other appropriate agencies to investigate and determine if the vapor concentration is at an explosive level or if the vapors could rise to an explosive level. The responsible person is strongly encouraged to comply with fire department recommendations for alleviating any threat of an explosion. If vapor concentrations are at a noticable level, the situation may pose a risk to human health and the responsible person must take immediate actions to reduce the threat. Contact your local fire department.

South Dakota's hazardous waste rules do not specify a VOC level as a hazardous waste characteristic. However, the State of Washington has established that a composite sample exceeding 10,000 ppm VOC may be designated as a dangerous waste and should be handled accordingly. The 10,000 ppm level may be useful for contractors to use as a threshold when working with septic wastes. If a composite sample exceeds 1000ppm VOC it may be appropriate to aerate the tank to further reduce levels of VOC. If a composite sample is below 1000 ppm VOCs the State of Washington specifies the waste may be managed for disposal at a waste treatment facility, sewage treatment plant, or hazardous waste management contractor/facility, *subject to acceptance by the facility operator*.

It is recommended that the septage from clandestine meth labs be processed at a local wastewater lagoon or a mechanical wastewater treatment plant. A standard septage hauler should be able to handle this material for disposal, *subject to acceptance by the facility operator.*

If the concentrations of solvents in septic tank liquids are found in excess of applicable standards, soil samples should be collected from below the leach lines. Samples should be placed in glass jars, filled to the top to minimize head space, secured with a septum lid or suitable alternative as accepted by the analytical laboratory. Each container should be labeled with date, time, sample, location and kept cool until they can be delivered to the analytical laboratory of choice.The South Dakota Department of Agriculture and Natural Resources can provide a listing of environmental contractors with expertise in soils assessment and remediation.

SAMPLE SHIPMENT

Various regulations apply to the shipment of hazardous materials. When samples are to be shipped, rather than hand-carried to a laboratory, the regulations and the specific requirements of

the shipping agent must be followed. The analysis laboratory of choice will be capable of providing the needed assistance.

RECORD KEEPING

The person or entity responsible for the property should also be responsible for keeping all records and documents pertaining to the evaluation and cleanup of the property. All inspections and evaluations should be documented in writing and included as part of the Written Cleanup Plan. The documented information should include the dates that activities were performed, name of the person who performed the work, the company responsible for the work, the person writing the report and the date that the report was issued. All sampling results should be certified by the laboratory that performed the analyses and all reports should be in writing. Any other documents such as drawings, handwritten notes, and photographs should be signed, dated, and included as part of the cleanup records. If the authorities listed at the beginning of this document require disclosure of prior manufacturing of methamphetamine, the completed cleanup records should be used as evidence that contamination reduction activities have been completed.

CONTACTS

If you have questions or wish to request additional information regarding cleanup of clandestine methamphetamine laboratories, refer to the State Agency Responsibility Matrix (Attachment D) of this document.

To report a known or suspected methamphetamine laboratory, contact your local law enforcement agency.

ATTACHMENT A

Chemicals, Products and Items Associated with Clandestine Methamphetamine Laboratories

Acetone	Methamphetamine
Acetic acid	Methyl Alcohol
Aluminum	Methyl Ethyl Ketone
Ammonia (anhydrous)	Methylamine
Ammonium Hydroxide	Methylene Chloride
Benzene	Muriatic Acid
Black Iodine	Petroleum Naphtha
Bronchodilators	Nitroethane
Camp Stove Fuel	Mineral Spirits
Chloroform	Phenylacetone
Cold Tablets	Phosgene Gas
Diet Aids (pharmaceuticals)	Phosphine Gas
Energy Boosters	Phosphoric Acid
Ephedrine (over-the-counter)	Phosphorus Pentachloride
Epsom Salts	Phosphoric Acid
Ether	Potassium Chromate
Ethyl Acetate	Potassium Dichromate
Ethyl Alcohol	Potassium Permanganate
Ethyl Ether	Propane Cylinders
Formic Acid	Pseudoephedrine
Freon	Red Devil Lye®
Hot Plates	Red Phosphorus
Hydrochloric Acid	Rock Salt
Hydrogen Iodide	Starting Fluid
Hydrogen Peroxide	Sodium Dichromate
Heet®	Sodium Hydroxide
Iodine (crystals)	Sodium Metal
Isopropyl Alcohol	Sulfuric Acid
Lead	Toluene / Paint Thinner
Lithium Metal (batteries)	Matchbooks (red phosphorous)
Mercury	Yellow Phosphorus

*This list is not intended to contain all possible chemicals that might be found in association with Clandestine Methamphetamine Labs.

ATTACHMENT B

Collection of Samples from Non-porous Surfaces (Wipe Samples)

Wipe samples are taken to determine the extent of contamination on non-porous surfaces such as tile, linoleum, and formica. On porous surfaces such as carpets and drapes, this sampling technique is only qualitative, indicating the possible presence or absence of a contaminant; and would not be useful if the contaminant is difficult to separate from the non-porous material.

Paper filters are generally used for collection of metals. Mixed cellulose ester filter discs (AA filters) or smear tabs, or their equivalents, are most often recommended. Polyvinyl chloride filters are available for substances that are unstable on paper-type filters. Squares of gauze material may be used for many organic substances, and have the advantage of being more durable than filter media, especially when wiping rough surfaces. They may be used dry or wetted with water or solvent to enhance collection efficiency.

The following procedure is recommended for collecting wipe samples.

- The multiple samples are to be taken at the site, prepare a rough sketch of the area to be sampled.

- A new set of clean, impervious gloves should be used for each sample to avoid contamination of the filter by previous sampling activities and to prevent contact with the substance by the person taking the sample.

- Withdraw the filter from the storage vial with gloved finders or clean tweezers. If a damp sample is desired, moisten the filter with distilled water or solvent as recommended.

- To determine the concentration of the contaminant on a surface, it is necessary to measure and record the area of the surface wiped (ie, 100 cm^2 – kitchen stove top).

- Firm pressure should be applied when wiping.

- Wipe in a manner that insures complete coverage of the area (side to side / top to bottom).

- Without allowing the filter to come into contact with any other surface, fold the filter with the exposed side in. If possible, use the same filter to repeat the sampling of the same area, then fold it over again. Place the filter in a sample vial, cap it and number it, noting the number on the sketch. Be sure to document any additional details of the sample on the sketch.

- At least one blank filter treated in the same fashion, but without wiping should be submitted for each sampled area.

ATTACHMENT C

Chemical Specific Cleanup Levels

Chemical	Cleanup Level
Corrosives*	Surface pH 6-8
Volatile Organic Compounds / Solvents **	Total VOCs (volatile organic compounds in air after ventilation) <1ppm TLV.
Methamphetamine	<.1 ug/100cm^2
Red Phosphorus	Removal of stained material
Iodine flakes, crystals, prill	Removal of stained material
Tincture of iodine	Removal of stained material
Mercury+ (airborne)	<50 ng/m^3 of air.
Lead+ (surface)	<20 ug/ft^2 wipe sample – total lead

* Corrosives include but are not limited to Hydrochloric Acid, Sulfuric Acid, Sodium Hydroxide, Anhydrous Ammonia, Phosphoric Acid, Muriatic Acid

** VOCs / Solvents include but are not limited to Acetone, Benzene, Ether, Freon, Hexane, Isopropanol, Methanol, Toluene, Xylene. This level is for air monitoring only and does not apply to septic tanks.

\+ The mercury and lead measurements are background levels for average houses. Testing is warranted when the amalgam method of methamphetamine production is suspected.

NOTE: (08/2004) To our knowledge, neither mercury nor lead has been found in a South Dakota lab to date. Lead and mercury were (uncommonly) present at past lab operations in other states so cleanup levels are included here in the event they may be needed and to raise awareness of their potential use. Typically, the processes (methods using phenyl-2-propanine (P2P) precursor) that used lead and mercuric compounds have been abandoned in favor of simpler methods using lithium and sodium metal.

Additional Notes:

- Acids and Bases / Corrosives: Surface pH testing on all horizontal surfaces should provide reasonable assurance that common acids and bases are not present at levels posing a health hazard. The acceptable pH is between 6 and 8.

- VOCs: Volatile organic compound testing in air will provide reasonable assurance that common solvents are not present at levels posing a health and safety hazard. Volatile organic compound testing should be completed in all rooms of the structure, as well as over soils suspected of contamination with meth lab chemicals. The instrument may also be employed to detect sources of residual contamination, such as in heating vents and sewer lines. Measured levels must reach <1 part per million (ppm). Calibrated photoionization detectors (PIDs) are acceptable measurement instruments, although other suitable technology can be used as well. Such instruments provide real-time, direct read

measurements of VOC air concentrations. The assessment of VOCs should take place after cleanup and any encapsulate utilized has cured. Prior to the assessment, the indoor air temperature must have been returned to about 70 degrees Fahrenheit for a minimum of 24 hours. If prior sampling was conducted and the test results indicated VOCs were at acceptable levels, further testing for those contaminants should not be necessary.

- Methamphetamine; Ephedrine; Pseudoephedrine: Methamphetamine testing has been selected as the principal indicator of contamination based on previous studies and general experience demonstrating elevated levels in meth laboratories. Cleaning to <.1 ug/100cm^2 should also provide reasonable assurance that ephedrine and pseudoephedrine levels are within acceptable limits.

  Wipe samples should be limited to non-porous surfaces and can include floors, walls, countertops, tables, etc. Composite sampling can be used to determine if contamination exists but cannot provide information about location specific concentrations. Most sample collection should be discrete. It is recommended that vertical (walls, doors) and horizontal (floors, countertops) surfaces be sampled.

  Testing should be done on separate locations/components of a ventilation system, specifically including the supply air diffuser and the ductwork immediately adjacent to the supply air diffuser. This testing should be done after the furnace has been supplying heated air for at least one hour.

  If a kitchen is in the structure, additional wipes should be collected and analyzed from the countertop/sink/stovetop, and from the floor in front of the stove.

  If a bathroom is in the structure, additional wipes should be collected and analyzed. Generally samples should be selected from the toilet, tub/shower, and sink surfaces, although specific sampling may vary depending on individual situations.

  After cleaning and sealing, any area showing visible stain that could reasonably be associated with drug manufacture should be tested.

  After a sample is collected from a porous article such as upholstered furniture, rugs or carpet, a section of material should be removed (cut) from the article and placed in a wipe sample bottle.

- Phosphorus; Iodine: Removal of stained materials is the best means of remediating for contamination involving red phosphorous, iodine crystals, and tincture of iodine. Although not preferred, where removal of stained material is not a reasonable option (such as concrete), the surface can be power-washed, allowed to dry, and then sealed. However, stains may reappear at a later time.

- Mercury and Lead: The possibility of obtaining false positives for lead and mercury exists. These materials were commonly added to paints. Homes built before 1978 will show positive for lead and homes built before 1990 will show positive for mercury.

When lead or mercury is discovered or there is evidence that either may be present in excess of normal background levels, notify the South Dakota Department of Agriculture and Natural Resources.

If mercury is found or highly suspected, all traps in the plumbing system should be evaluated for the presence of mercury and either replaced or cleaned. In all cases that involve mercury, the building should be evacuated by all personnel not specifically trained in the evaluation and remediation of mercury contamination.

- Other chemicals: Other chemicals of concern should be evaluated individually. Toxicological databases such as TOXLINE or HSDB (Hazardous Substances Data Base) may be used to obtain references that might aid in identifying a critical study on which a hazard estimation can be based. The EPA Risk Assessment Guidance for Superfund (RAGS) can be consulted for additional guidance. A toxicologist may also be consulted.

ATTACHMENT D

State Agency Responsibility Matrix

There is no federal standard for cleanup of former clandestine meth labs. Without federal direction, some states have established cleanup levels for meth that range from 0.1 ug/100cm^2 to .5 ug/100cm^2. The differences in state cleanup levels simply highlights the fact there is not yet any scientifically valid health based standard and states are using either detection levels or levels that they think are practical as the standard. Because it is anticipated that it will be years before a scientific standard is developed, this guideline was developed with the intention of identifying a logical sequence of clean up procedures that can be undertaken by property owners to protect the health and safety of future occupants of former meth labs. Because these guidelines are based on both public health and environmental principles, both the Department of Health and the Department of Agriculture and Natural Resources have expertise in the different topics as identified below.

Department of Agriculture and Natural Resources (DANR) 523 East Capitol Pierre, SD 57501-3181 (605) 773-3296	Department of Health (DOH) 600 East Capitol Avenue Pierre, SD 57501-2536 (605) 773-3361

TOPIC	AGENCY / Agency Contact
HEALTH HAZARDS	
EXPOSURE RISK AND ROUTES	DOH / Dr. Joshua Clayton – 773-3737 or Amanda Nelson – 367-7436
PREPARATION FOR CLEANUP	
CLEANUP CONTRACTORS	DANR / Trish Kindt – 773-3296
INITIAL EVALUATION	DANR / Trish Kindt – 773-3296
CLEANUP	
CLEANUP INSTRUCTIONS	DANR / Trish Kindt – 773-3296
DISPOSITION OF CONTAMINATED MATERIALS	DANR / Carrie Jacobson – 773-3153
EVALUATION FOLLOWING CLEANUP	
POST-CLEANUP OUTDOOR AND SURFACE SAMPLING	DANR / Trish Kindt – 773-3296
SAMPLING GUIDELINES AND PROCEDURES	DOH / Stacy Ellwanger – 773-3241