

## DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

### State Board of Health

## CLEANUP OF METHAMPHETAMINE LABORATORIES

### 6 CCR 1014-3

*[Editor's Notes follow the text of the rules at the end of this CCR Document.]*

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#### 1.0 Purpose

Pursuant to section 25-18.5-102, C.R.S., the Board of Health is authorized to establish standards for the cleanup of illegal laboratories used to manufacture methamphetamine, which property owners are required to meet pursuant to Section 25-18.5-103, C.R.S., except that a property owner may elect instead to demolish the contaminated property.

#### 2.0 Applicability

The requirements of this section apply (1) when an owner of property has received notification from a peace officer that chemicals, equipment, or supplies indicative of a drug laboratory are located at the property, or 2) when a drug laboratory is otherwise discovered, and the owner of the property where the drug laboratory is located has received notice.

#### 3.0 Definitions

“Building” means a structure which has the capacity to contain, and is designed for the shelter of, man, animals, or property, or place adapted for overnight accommodations of persons or animals, whether or not a person or animal is actually present. “Building” includes manufactured homes as defined in Section 38-29-102(6), C.R.S., and mobile homes as defined in Section 38-12-201.5(2), C.R.S..

“Certified Industrial Hygienist” or “CIH” means an individual who is certified by the American Board of Industrial Hygiene or its successor.

“Chemical storage area” means any area where chemicals used in the manufacture of methamphetamine are stored or have come to be located.

“Cleanup level” means the numerical value, established in section 7.0 of this regulation, that causes the consultant to determine if an area is compliant or noncompliant based on the results of sampling conducted in accordance with the sampling procedures presented in Appendix A.

“Consultant” means a Certified Industrial Hygienist or Industrial Hygienist who is not an employee, agent, representative, partner, joint venture participant, shareholder, parent or subsidiary company of the contractor.

“Contaminant” means a chemical residue that may present an immediate or long-term threat to human health and the environment.

“Contamination” or “Contaminated” means the presence of chemical residues, which may present an immediate or long-term threat to human health or the environment.

“Contractor” means one or more individuals or commercial entities hired to perform work in accordance with the requirements of this regulation.

“Cooking area” means any area where methamphetamine manufacturing is occurring or has occurred.

“Decision level” means that concentration, relative to the cleanup level, that shall be used to distinguish between compliant and non-compliant areas. The calculation for the decision level for composite samples is found in Appendix A, Composite Decision Level.

“Decontamination” means the process of reducing the level of contamination to the lowest practical level using currently available methods. At a minimum, decontamination must reduce contamination of specified substances below the concentrations allowed by this regulation.

“Demolition” means the wrecking or taking out of any load-supporting structural member, including any related handling operations.

“Department” means the Colorado Department of Public Health and Environment.

“Disposal” means handling, transportation and ultimate disposition of materials removed from contaminated properties.

“Documentation” means preserving a record of an observation through writings, drawings, photographs, or other appropriate means.

“Encapsulation” means applying a surface sealant to create a physical barrier intended to decrease or to eliminate the potential for exposure to residual contaminants that may exist beneath the physical barrier even after decontamination.

“Functional space” means a space where the spread of contamination may be expected to occur relatively homogeneously, compared to other functional spaces. The “functional space” may be a single room or a group of rooms, designated by a consultant who, based on professional judgment, considers the space to be separate from adjoining areas with respect to contaminant migration. Other typical examples of functional spaces include a crawl space, an attic, and the space between a dropped ceiling and the floor or roof deck above.

“HEPA filtration” means a filtering system capable of trapping and retaining at least 99.97 percent of all monodispersed particles 0.3 microns in diameter or larger.

“Independent” means that a person is not an employee, agent, representative, partner, joint venturer, shareholder, or parent or subsidiary company of another person.

“Individual sewage disposal system” or “ISDS” means an absorption system of any size or flow or a system or facility for treating, neutralizing, stabilizing, or disposing of sewage which is not part of or connected to a sewage treatment works.

“Industrial Hygienist” means an industrial hygienist as defined in Section 24-30-1402, C.R.S.

“Media” means the physical material onto which a sample substrate is collected. Media includes cotton gauze, glass fiber filters, MCE membranes, etc.

“Methamphetamine” means dextro-methamphetamine, levo-methamphetamine, and unidentified isomers of the same, any racemic mixture of dextro/levo methamphetamine, or any mixture of unidentified isomers of methamphetamine. The term includes derivatives, conjugates, oxides, and reduced forms of the basic structure associated with CAS registration number 537-46-2. For the purposes of this regulation, this term also includes amphetamine (CAS 300-62-9), ephedrine (CAS 299-42-3), and pseudoephedrine (CAS 90-82-4).

“Microvacuum sample” or “Vacuum sample” means a non-airborne dust sample collected from a known surface area of a porous surface or material using standard microvacuum sampling techniques as described in Appendix A of these regulations.

“Negative air unit” means a portable exhaust system equipped with HEPA filtration and capable of maintaining a constant high velocity airflow out of the contaminated area, resulting in a constant low velocity air flow into the contaminated area from adjacent uncontaminated areas

“Person” means any individual, public or private corporation, partnership, association, firm, trust or estate; the state or any executive department, institution, or agency thereof; any municipal corporation, county, city and county, or other political subdivision of the state; or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

“Publicly owned treatment works” or “POTW” means a publicly owned domestic wastewater treatment facility. The term also means the municipality, as defined in 502(4) of the Clean Water Act, 33 U.S.C. § 1362(4), which has jurisdiction over the indirect discharges to and the discharge from such treatment works.

“Preliminary assessment” means an evaluation of a property to determine the current condition, including the nature and extent of observable or detectable contamination, chemical storage and disposal.

“Property” means anything that may be the subject of ownership or possession, including, but not limited to, land, buildings, structures, vehicles and personal belongings.

“Property owner” for the purpose of real property, means the person holding fee title to real property.

“Property owner” also means the person holding title to a manufactured home. With respect to personal property, the term means the person who lawfully owns such property.

“Removal” means the taking out or stripping of material or surfaces to eliminate the potential for exposure to contaminants on or in the material or surfaces.

“Substrate” means the material being collected. Substrates may include soils, water, painted surfaces, carpet debris, unidentified powders, dust, etc.

“Vehicle” means any object defined as a “vehicle” in section 42-1-102, C.R.S. “Vehicle” includes recreational vehicles, campers, buses with a toilet and a galley, trailers as defined in section 42-1-102(105) C.R.S., trailer coaches as defined in 42-1-102(106)(a) C.R.S., and motor homes as defined in § 42-1-102(57), C.R.S.

“Waste disposal area” means any area where chemicals used or generated in the manufacture of methamphetamine are disposed or have come to be located.

“Wipe sample” means a surface sample collected by wiping a sample media on the surface being sampled in accordance with Appendix A.

#### **4.0 Preliminary Assessment.**

A preliminary assessment shall be conducted by the consultant, in accordance with section 6.7 of this regulation, prior to the commencement of property decontamination. Information gained during the preliminary assessment shall be the basis for property decontamination and clearance sampling. Contractors and consultants shall use appropriate personal protective equipment during the preliminary assessment. Access to the property shall be limited to those with appropriate training and personal protective equipment. Information collected during the preliminary assessment shall include, but not be limited to, the following:

- 4.1. Property description including physical address, legal description, number and type of structures present, description of adjacent and/or surrounding properties, and any other observations made.
- 4.2. Review of available law enforcement reports that provide information regarding the manufacturing method, chemicals present, cooking areas, chemical storage areas, and observed areas of contamination or waste disposal.
- 4.3. Identification of structural features that may indicate separate functional spaces, such as attics, false ceilings and crawl spaces, basements, closets, and cabinets.
- 4.4. Identification of manufacturing methods based on observations and law enforcement reports.
- 4.5. Identification of chemicals used, based on observations, law enforcement reports, and knowledge of manufacturing method(s).
- 4.6. Identification and documentation of areas of contamination. This identification may be based on visual observation, law enforcement reports, proximity to chemical storage areas, waste disposal areas, or cooking areas, or based on professional judgment of the consultant; or the consultant may determine that assessment sampling is necessary to verify the presence or absence of contamination. If the consultant determines that assessment sampling is necessary, such sampling shall be conducted in accordance with the sampling protocols presented in Appendices A and D. Sample analysis shall be conducted in accordance with the method requirements presented in Appendices B and D.
- 4.7. Identification and documentation of chemical storage areas.
- 4.8. Identification and documentation of waste disposal areas.
- 4.9. Identification and documentation of cooking areas.
- 4.10. Identification and documentation of signs of contamination such as staining, etching, fire damage, or outdoor areas of dead vegetation.
- 4.11. Inspection of plumbing system integrity and identification and documentation of potential disposal into the sanitary sewer or an individual sewage disposal system (ISDS). If the consultant determines that field screening and/or sampling of an ISDS is necessary to determine if methamphetamine lab wastes have been disposed of into an ISDS, such field screening and/or sampling shall be conducted in accordance with the field screening and sampling protocols presented in Appendix D. Sample analysis shall be conducted in accordance with the method requirements presented in Appendices B and D.
- 4.12. Identification of adjacent units and common areas where contamination may have spread or been tracked.
- 4.13. Identification and documentation of common ventilation systems with adjacent units or common areas.
- 4.14. Photographic documentation of property conditions, including cooking areas, chemical storage areas, waste disposal areas, and areas of obvious contamination.

## **5.0 Decontamination Procedures.**

Decontamination shall be conducted to reduce the concentration of contaminants to the levels specified in Section 7.0 of this regulation. Decontamination shall be conducted in accordance with procedures designed to protect workers, future occupants, neighbors and the general public, and shall include, but not be limited to, the following:

- 5.1. A negative air unit, equipped with a HEPA filtration system, shall be used throughout the decontamination process to reduce airborne particulates.
- 5.2. Detergent water washing of non-porous, porous and semi porous surfaces that are contaminated, or that are reasonably expected to be contaminated, that will not be removed.
- 5.3. Removal of all contaminated material that will not or cannot be decontaminated to cleanup levels specified in Section 7.0 of the regulation. Removal of all contaminated materials if sampling cannot demonstrate that cleanup levels have been met. Any removal of asbestos or lead based paint must be conducted in accordance with all Federal, State and local requirements.
- 5.4. Encapsulation of porous and semi porous surfaces may be conducted after detergent water washing and after clearance sampling has demonstrated that cleanup levels have been achieved.
- 5.5. Decontamination of ventilation systems by a contractor that is trained and equipped to comply with the protocol for ventilation system decontamination presented in Appendix C of these regulations.
- 5.6. Water flushing of plumbing systems connected to the sanitary sewer to eliminate any residual chemicals.
- 5.7. Inspection of individual sewage disposal systems (ISDSs) and, if warranted, testing in accordance with the protocol presented in Appendix D of these regulations, to determine if the ISDS has been impacted by methamphetamine lab derived chemical wastes.
- 5.8. Personal Property
  - 5.8.1 Personal property must either be decontaminated to the cleanup levels specified in section 7.0 of this regulation, or properly disposed in accordance with these regulations.
  - 5.8.2 Personal property that will not be disposed of must be sampled in accordance with procedures described in Appendix A of this regulation. Discrete samples must be collected from each individual item, except as provided in 5.8.3.
  - 5.8.3 Composite samples may be collected in accordance with the following procedure. Composite samples must be taken from items constructed of like materials that are contained within the same individual functional space (e.g., clothing from a bedroom closet may be sampled as a composite, fabric furniture within a living room may be sampled as a composite, draperies within an individual room may be sampled as a composite, non-porous goods such as wood or metal tables, shelves, cabinets, etc. in the same room may be sampled as a composite, etc.). A composite sample is considered representative of contaminant levels on all personal property of that type material within the same functional space. No more than 5 individual items may be included in any one composite sample. Should analysis of composite samples from multiple items indicate methamphetamine levels in excess of the cleanup level, all items comprising the composite sample will be considered to be in excess of cleanup levels.

- 5.9. Waste management shall be conducted in accordance with the Colorado Hazardous Waste Regulations (6 CCR 1007-3) and the Colorado Solid Waste Regulations (6 CCR 1007-2). Debris and contaminated material generated during methamphetamine lab decontamination shall be managed as solid waste, with notification provided to the landfill for methamphetamine lab contaminated material. Wash water can be containerized for offsite disposal, or disposed to the sanitary sewer with approval from the POTW. Wastes removed from ISDSs shall be disposed of as either solid or hazardous waste based on results of laboratory analysis as described in Appendix D of these regulations.
- 5.10. Any demolition of all or part of a structure shall be conducted in accordance with all local State and Federal requirements.

## **6.0 Sampling and Analytical Procedures.**

- 6.0.1 Except as provided in 6.0.2, assessment sampling shall be conducted as part of the preliminary assessment to characterize the nature and extent of contamination. Assessment sampling and laboratory analysis shall be conducted in accordance with Appendices A, B and D of these regulations.
- 6.0.2 As provided in Appendix A of these regulations, the consultant may determine that some areas should be deemed to be contaminated based on data other than assessment sampling. Areas that are deemed to be contaminated do not need to be sampled as part of the preliminary assessment.
- 6.0.3 Post-decontamination clearance sampling shall be conducted to verify that cleanup standards have been met. Sample collection and laboratory analysis shall be conducted in accordance with the procedures set forth in Appendices A, B and D of these regulations.
- 6.1. Locations of samples shall be based on information gathered during the preliminary assessment. Samples shall be collected from:
- 6.1.1. Areas expected to have the highest levels of contamination, such as cooking areas, chemical storage areas, and waste disposal areas.
  - 6.1.2. Areas where contamination may have migrated, such as adjacent rooms or units, common areas, and ventilation systems.
- 6.2. The number and type of samples shall be based on the size of the area or material, the chemical or contaminant being tested for, and the purpose of the sample (i.e., initial assessment or final clearance).
- 6.2.1. Discrete sampling is required in all cases, except as provided in 6.2.2 of these regulations.
  - 6.2.2. Composite sampling may only be conducted in situations where contamination is expected to be relatively evenly dispersed throughout a given area, and composite sampling will provide an accurate representation of the area sampled, as described in Appendix A.
- 6.3. Sample handling, including labeling, preservation, documentation, and chain-of-custody, shall be conducted in a manner consistent with the requirements of the analytical method being used.
- 6.4. Analytical methods shall be based on the compound being sampled for. Sample analysis shall be conducted in accordance with the method requirements presented in Appendices B and D of these regulations.

- 6.5 If the property has an ISDS, evaluation and sampling of the ISDS shall be conducted in accordance with Appendix D of these regulations. The investigation and cleanup of soil, surface water and groundwater contamination resulting from disposal of methamphetamine lab wastes into an ISDS shall be conducted in accordance with either the Colorado Hazardous Waste Regulations, or the Colorado Solid Waste Regulations, as appropriate based on sampling results, and with Water Quality Control Commission Regulations 31 and 41.
- 6.6. Quality Control/Quality Assurance (QA/QC) samples, including sample blanks, field duplicates, matrix spike and matrix spike duplicates, shall be collected and/or analyzed as specified in the sampling and analysis protocols presented in Appendices A, B and D of these regulations. Laboratory QA/QC shall be conducted in accordance with method requirements as specified in Appendix B of these regulations.
- 6.7. To prevent any real or potential conflicts of interest, consultants conducting preliminary assessments and post-cleanup assessments must be independent of the company or entity that will subsequently conduct the drug lab cleanup, except as provided in 6.7.1.
- 6.7.1 Consultants need not be independent of the company or entity that will subsequently conduct the drug lab cleanup if both the consultant and the cleanup entity are employees of the property owner, provided the property owner was not involved in drug manufacturing that resulted in contamination of the property.

## **7.0 Cleanup Levels.**

The following cleanup levels shall be used to determine if a property has been adequately decontaminated. They may also be used during the preliminary assessment to demonstrate that a property, or portion of a property, is not contaminated. All properties must meet the cleanup level for methamphetamine. Additional cleanup levels that may be applied to a property shall be based on information gained during the preliminary assessment.

- 7.1. Surface wipe samples and vacuum samples for methamphetamine shall not exceed a concentration of 0.5 µg /100 cm<sup>2</sup>.
- 7.2. If there is evidence of iodine contamination on materials or surfaces that will not be removed, surface wipe samples for iodine shall not exceed a concentration of 22 µg/100 cm<sup>2</sup>.
- 7.3. If the preliminary assessment indicates the phenyl-2-propanone (P2P) method of methamphetamine manufacturing was used, surface wipe samples for lead shall not exceed a concentration of 40 µg /ft<sup>2</sup>, and vapor samples for mercury shall not exceed a concentration of 1.0 µg /m<sup>3</sup>.
- 7.4. The investigation and cleanup of outdoor contamination, including soil, surface water and groundwater, shall be conducted in accordance with the Colorado Hazardous Waste Regulations, the Colorado Solid Waste Regulations, and Water Quality Control Commission Regulations 31 and 41.

## **8.0 Reporting.**

A final report shall be prepared by the consultant to document the decontamination process and demonstrate that the property has been decontaminated to the cleanup levels listed in Section 7.0 of these regulations. The final report shall include, but not be limited to, the following:

- 8.1. Property description including physical address, legal description, ownership, number and type of structures present, description of adjacent and/or surrounding properties, and any other observations made.

- 8.2. Description of manufacturing methods and chemicals used, based on observations, law enforcement reports and knowledge of manufacturing method.
- 8.3. If available, copies of law enforcement reports that provide information regarding the manufacturing method, chemicals present, cooking areas, chemical storage areas, and observed areas of contamination or waste disposal.
- 8.4. A description of chemical storage areas, with a figure documenting location(s).
- 8.5. A description of waste disposal areas, with a figure documenting location(s).
- 8.6. A description of cooking areas, with a figure documenting location(s).
- 8.7. A description of areas with signs of contamination such as staining, etching, fire damage, or outdoor areas of dead vegetation, with a figure documenting location(s).
- 8.8. The results of inspection of plumbing system integrity and identification of sewage disposal mechanism.
- 8.9. A description of adjacent units and common areas where contamination may have spread or been tracked.
- 8.10. Identification of common ventilation systems with adjacent units or common areas.
- 8.11. A description of the sampling procedures used, including sample collection, handling, and QA/QC.
- 8.12. A description of the analytical methods used and laboratory QA/QC requirements.
- 8.13. A description of the location and results of initial sampling (if any), including a description of sample locations and a figure with sample locations and identification.
- 8.14. A description of the health and safety procedures used in accordance with OSHA requirements.
- 8.15. A description of the decontamination procedures used and a description of each area that was decontaminated.
- 8.16. A description of the removal procedures used and a description of areas where removal was conducted, and the materials removed.
- 8.17. A description of the encapsulation procedures used and a description of the areas and/or materials where encapsulation was performed.
- 8.18. A description of the waste management procedures used, including handling and final disposition of wastes.
- 8.19. A description of the location and results of post-decontamination samples, including a description of sample locations and a figure with sample locations and identification.
- 8.20. Photographic documentation of pre- and post-decontamination property conditions, including cooking areas, chemical storage areas, waste disposal areas, areas of obvious contamination, sampling and decontamination procedures, and post-decontamination conditions.
- 8.21. Consultant statement of qualifications, including professional certification or qualification as an industrial hygienist as defined in section 24-30-1402, C.R.S., and description of experience in assessing contamination associated with methamphetamine labs.



8.22. Certification of procedures and results, and variations from standard practices.

8.23. A signed certification statement in one of the following forms, as appropriate:

"I do hereby certify that I conducted a preliminary assessment of the subject property in accordance with 6 CCR 1014-3, § 4, and that I conducted post-decontamination clearance sampling in accordance with 6 CCR 1014-3, § 6. I further certify that the property has been decontaminated in accordance with the procedures set forth in 6 CCR 1014-3, § 5, and that the cleanup standards established by 6 CCR 1014-3, § 7 have been met as evidenced by testing I conducted."

"I do hereby certify that I conducted a preliminary assessment of the subject property in accordance with 6 CCR 1014-3, § 4. I further certify that the cleanup standards established by 6 CCR 1014-3, § 7 have been met as evidenced by testing I conducted."

8.24. Signature of the consultant.

8.25. The property owner and consultant shall each retain a copy of the report for a period of seven years.

8.26 To obtain the immunity provided in § 25-18.5-103(2), C.R.S., the owner must provide a copy of the report to the governing body. It is advisable to submit the report by certified mail, return receipt requested, or some other method that provides an acknowledgement of receipt by the governing body.

## **9.0 Referenced Materials.**

These regulations incorporate by reference (as identified within) materials originally published elsewhere. These regulations do not include later amendments to or editions of the incorporated materials. The Department of Public Health and Environment maintains copies of the complete text of the incorporated materials for public inspection during regular business hours, and shall provide certified copies of any non-copyrighted material to the public at cost upon request.

Information regarding how the incorporated materials may be obtained or examined is available from:

Division Director  
Hazardous Materials Waste Management Division HMWMD-B2  
Colorado Department of Public Health and Environment  
4300 Cherry Creek Drive South  
Denver, CO 80246

Copies of the incorporated materials have been provided to the State Publications Depository and Distribution Center, and are available for interlibrary loan. The incorporated materials may be examined at any state publications depository library.

### **List of Materials Incorporated by Reference**

American Society for Testing and Materials (ASTM) Method D3278-96e1 (October 1997), Standard Test Methods for Flash Point of Liquids by Setaflash Closed Tester.

American Society for Testing and Materials (ASTM) Method D5756-02 (November 2002), Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Mass Concentration.

American Society for Testing and Materials (ASTM) Method D93-02a (December 2002), Standard Test Methods for Flash Point by Pensky-Martens Closed Tester.

Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup, EPA-560/5-86-017 (May 1986).

National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services (DHHS), NIOSH Manual of Analytical Methods (NMAM), 4th. Ed., DHHS (NIOSH) Publication No. 94-113 (August, 1994), 1st supplemental publication 96-135 (1996), 2nd supplement publication 98-119 (1998):

Method 6009, Mercury (Issue 2, August 1994).

Method 9100, Lead in Surface Wipe Samples (Issue 2, May 1996).

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846 [Third Edition (November 1986), as amended by Updates I (dated July 1992), II (dated September 1994), IIA (dated August 1993), IIB (dated January 1995), III (dated December 1996) and IIIA (dated April 1998)]:

Method 1010, Pensky-Martens Closed-Cup Method for Determining Ignitability (Revision O, September 1986).

Method 1020A, Setaflash Close-Cup Method for Determining Ignitability (Revision 1, July 1992).

Method 1110, Corrosivity Toward Steel (Revision O, September 1986).

Method 6020, Inductively Coupled Plasma – Mass Spectrometry (Revision O, September 1994).

Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) (Revision 2, December 1996).

Method 9014, Titrimetric and Manual Spectrophotometric Determinative Methods for Cyanide (Revision O, December 1996).

Method 9021, Purgeable Organic Halides (POX) (Revision O, December 1996).

Method 9034, Titrimetric Procedure for Acid-Soluble and Acid Insoluble Sulfides (Revision O, December 1996).

Method 9040B, pH Electrometric Measurement (Revision 2, January 1995).

## **APPENDIX A: METHAMPHETAMINE LABORATORIES - SAMPLING METHODS AND PROCEDURES**

### **Purpose**

The purpose of this appendix is to provide a procedure for reducing variability in the collection of samples in the characterization of contaminants at illegal drug laboratories. Additional discussion of the sampling theory for sampling techniques described in this appendix are provided in the attachment at the end of this appendix.

### Pre-decontamination sampling

In pre-decontamination sampling, the assumption (hypothesis) is made that the area is clean i.e. “compliant,” and data will be collected to find support for the hypothesis. Data (such as samples) are collected to “prove” the area is compliant. Sampling, if it is performed, is conducted in the areas with the highest probability of containing the highest possible concentrations of contaminants. Any data that disproves the hypothesis, including police records, visual clues of production, storage, or use or documentation of drug paraphernalia being present, is considered conclusive, and leads the consultant to accept the null hypothesis and declare the area non-compliant.

#### Post-Decontamination sampling

In post-decontamination sampling, the hypothesis is made that the area is non-compliant, and data is collected to test the hypothesis. The role of the consultant in post decontamination sampling is not to demonstrate that the area is “clean,” but rather, using biased sampling, to diligently attempt to prove that the area is not clean. The lack of data supporting the hypothesis leads the consultant to accept the null hypothesis and conclude that the area is compliant.

#### **Decision Statement**

If, based on the totality of the circumstances, the consultant finds that insufficient evidence exists to support the hypothesis that any given area is non-compliant, that area shall be deemed to be compliant with section 25-18.5-103 (2), C.R.S., and shall be released. If objective sampling data indicates contamination is less than the cleanup level, that data may be used as prima facie evidence that insufficient evidence exists to support the hypothesis that any given area is non-compliant.

#### **Area Samples**

##### Buildings and Structures

###### Wipe Sample and/or Vacuum Sample

For drug laboratories, as defined in section 25-18.5-101, C.R.S., whose structural floor plan is not greater than 1,500 square feet, surface sampling shall be collected according to the following schedule. Exception: for pre-decontamination scenarios, any and all other data may be used in lieu of sampling to reject the hypothesis and deem the area to be contaminated.

- For any given functional space, at least 500 cm <sup>2</sup> of surface shall be sampled, unless the area is assumed to be non-compliant.
- At least 1,000 cm <sup>2</sup> of total surface area must be sampled for any single laboratory identified pursuant to section 25-18.5-103, C.R.S.
- An additional 100 cm <sup>2</sup> must be sampled for every additional 500 square feet of structural floor space.
- No fewer than five samples shall be collected from any laboratory identified pursuant to section 25-18.5-103, C.R.S.

The required sample area shall be composed of no fewer than three discrete samples. Should composite samples be collected, each composite shall consist of no greater than five discrete samples collected in accordance with the procedures outlined in the section in this appendix on Composite Sampling.

Where the drug laboratory is located in a structure other than a single-family dwelling, the potential of fugitive emissions must be considered. For example, if the functional space was located in an hotel room, and evidence of contamination extended into the corridor, the elevator, the lobby, and one adjacent room, there would be four separate functional spaces to evaluate: 1) The primary hotel room, 2) the corridor/elevator complex 3) the lobby, 4) the adjacent hotel room.

Each functional space exhibiting indicia of contamination shall be sampled. For example, where a single-family dwelling meets the definition of a drug laboratory, and an associated detached garage contains indicia of contamination, the dwelling and the garage shall be evaluated separately.

## Vehicles

### Wipe Sample and/or Vacuum Sample

For drug laboratories in vehicles, surface sampling shall be collected according to the following schedule. Exception: for pre-decontamination scenarios, any and all other data may be used in lieu of sampling to reject the hypothesis and deem the area to be contaminated.

- A minimum of 500 cm<sup>2</sup> of surface shall be sampled, unless the area is assumed to be non-compliant.
- An additional 100 cm<sup>2</sup> must be sampled for every 50 square feet of structural floor space for any large vehicle, such as a recreational vehicle, motor home, trailer, or camper.
- No fewer than three samples shall be collected from any laboratory identified in a vehicle.

The required sample area shall be composed of no fewer than three discrete samples. Should composite samples be collected, each composite shall consist of no greater than five discrete samples collected in accordance with the procedures outlined in the section in this appendix on Composite Sampling.

## **Sampling Procedures**

### Non-Porous Surfaces - Wipe Samples

Wipe sampling shall be used to determine the extent of contamination on non-porous surfaces. Wipe samples shall be collected in accordance with the procedures set forth below for either discrete or composite samples.

Sample media may consist of one of the following:

- Gauze material, including Johnson & Johnson cotton squares or equivalent.
- Filter paper, including Whatman 40, 41, 42, 43, 44, 540, 541, Ahlstrom 54, VWR 454, S&S WH Medium, or other filter paper with equivalent performance.

The following procedure is for collecting discrete wipe samples from non-porous surfaces.

1. Attach disposable templates or masking tape to the area(s) to be sampled, being careful not to touch the area within the template. The sample area shall be 100 cm<sup>2</sup> (10cm by 10cm) or a multiple of 100 cm<sup>2</sup>.
2. Prepare a rough sketch of the area(s) to be sampled.
3. The sample media should be wetted with distilled water or solvent (isopropyl alcohol or methanol) to enhance collection efficiency.

4. Use a new set of clean, non-powdered impervious gloves for each sample to avoid contamination of the sample media by previous samples and to prevent contact with the substance.
5. Press the sample media down firmly, but not excessively, with the fingers, being careful not to touch the sample surface with the thumb. Blot rough surfaces uniformly instead of wiping. Wipe smooth surfaces as described below.
6. Wiping may be done by one of the following methods:
  - a. Square method: Start at the outside edge and progress toward the center of the surface area by wiping in concentric squares of decreasing size.
  - b. "S" method: Wipe horizontally from side-to-side in an overlapping "S" -like pattern as necessary to completely cover the entire wipe area.
7. Without allowing the sample media to come into contact with any other surface, fold the sample media with the sampled side in.
8. Use the same sample media to repeat the sampling of the same area. If using the "S" method, the second pass shall be sampled by wiping with overlapping "S" -like motions in a top-to-bottom direction.
9. Fold the sample media over again so that the sampled side is folded in. Place the sample media in a sample container, cap and number it, and note the number at the sample location on the sketch. Include notes with the sketch giving any further description of the sample.
10. At least one sample media blank, treated in the same fashion but without wiping, should be submitted for every 10 samples collected.

When collecting composite samples, the procedure outlined above shall be used with the following exceptions:

1. A single pair of gloves may be used to collect each single sample that will be part of a composite sample. However, a new pair of gloves must be used for each set of composite samples.
2. All individual samples that make up a composite sample must be placed in one sample container.

#### Porous Surfaces - Vacuum Sampling

Vacuum sampling shall be used to determine the extent of contamination on porous surfaces, including carpeting, drapery, upholstery, clothing, and other soft goods. Vacuum samples shall be collected in accordance with procedures for sample collection described in section 9 of the American Society for Testing and Materials (ASTM) Method D5756-02, *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Mass Concentration*. Vacuum samples will be analyzed for methamphetamine and/or derivatives in accordance with analytical methods described in Appendix B of this regulation.

Wipe sampling of porous surfaces may be conducted during the preliminary assessment, in lieu of vacuum sampling, in order to obtain a qualitative (absence or presence) identification of a chemical. Wipe sampling shall not be used to demonstrate that cleanup levels have been met on porous surfaces.

## Outdoors

For laboratories with outdoor components, or laboratories which are exclusively outdoors, the following sampling shall be performed when conditions indicate the potential for soil contamination. Sampling shall be conducted in accordance with the grid sampling method as described in the Midwest Research Institute's publication titled "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup" (referenced in 40 CFR § 761.130), which is incorporated herein by reference. Surface samples shall be taken to a depth of no greater than 8 cm. Sample volume should be at least 100 cm<sup>3</sup> and no more than 250 cm<sup>3</sup>. (Guidance on soil sampling can be found in ASTM D5730, ASTM E1727, ASTM D4700, and the EPA Environmental Investigations Standard Operating Procedures and Quality Assurance (EISOPQA) Manual. Additional subsurface samples may be required.

Other outdoor surfaces should be evaluated based on best professional judgment. Wipe samples and destructive samples may be required.

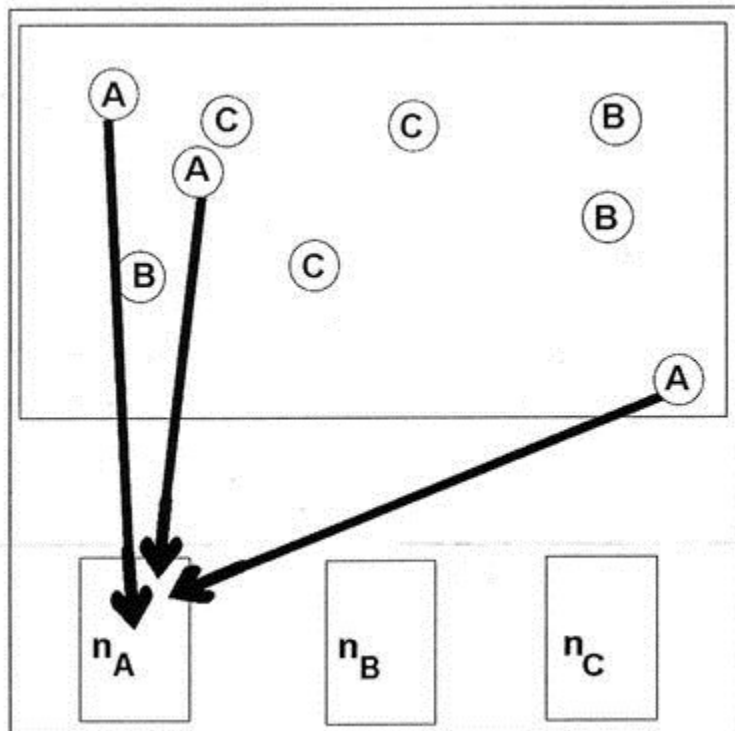
## **Composite Sampling**

Composite sampling is permitted by this regulation, as described herein. The consultant may not use composite sampling unless in their professional judgment, contamination is expected to be relatively evenly dispersed throughout a given area, such that the sampling will accurately represent the conditions of the drug laboratory. If compositing is used, then the composite shall consist of no greater than five discrete samples. Any composite sampling must consist of like media, matrices or substrates. The mixing of media, matrices or substrates is not permitted. All individual samples (designated as g), from which any single composite is formed must be of equal volume (for liquids), equal surface area (for surface wipe sampling or vacuum sampling) or equal weight (for solids).

Composite sampling may be implemented using one of the following sampling designs. The consultant shall choose the sampling design based upon the specific conditions of the drug laboratory being assessed.

### Simple Random Composite Sampling

Figure 1A below illustrates a simple random composite sampling design. In this figure, the sampled area could represent any surface or media about which a decision must be made (such as a series of walls, or carpeting or even contaminated soils).



In the above example, nine individual samples ( $n \cdot g = 9$ ) are composited into three samples for submission to a laboratory ( $X_A$ ,  $X_B$ ,  $X_C$ ).

The individual sample locations can be selected by any number of methods such as those as described in American Society for Testing and Materials (ASTM) Method D6051-96 (2001), *Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities*. The “system of halves” as described in 40 CFR § 761.306 may also be used. An example of the “system of halves” is provided below and illustrated in Figures 1B and 1C.

1. Select the surface which represents the area of highest possible contamination
2. Delineate one square meter within the area
3. Divide the one square meter area in half with an imaginary line in any direction
4. Assign each half “heads” or “tails”
5. Flip a coin
6. Divide the “winning side” in half with an imaginary line in any direction
7. Flip a coin
8. Continue dividing the “winning” side until the winning side is between 100 cm<sup>2</sup> and 200 cm<sup>2</sup> and collect the wipe sample from that area
9. The method is repeated for each individual (g) of the composite

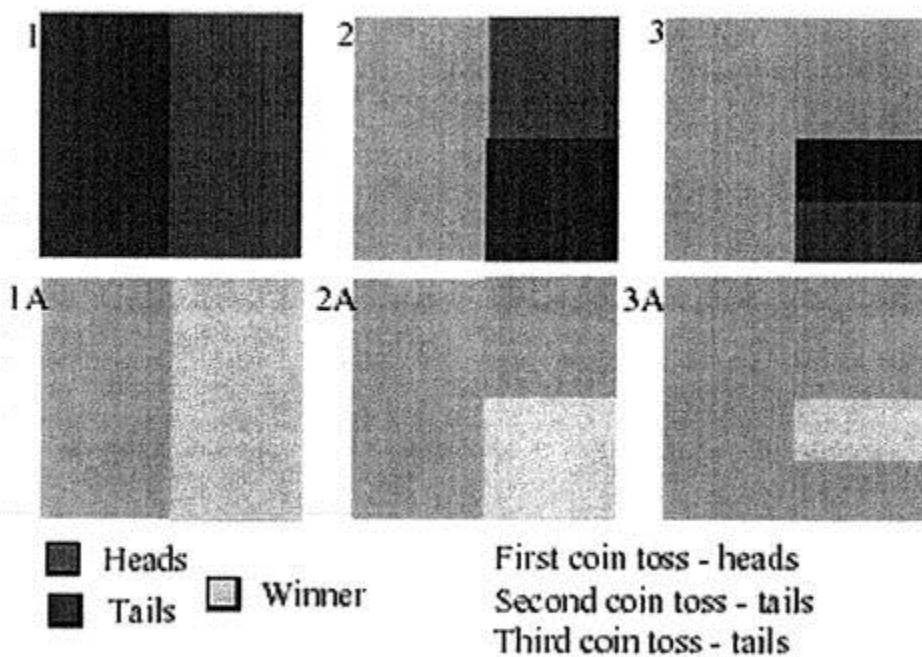


Figure 1B  
Example of Random Sample Composites

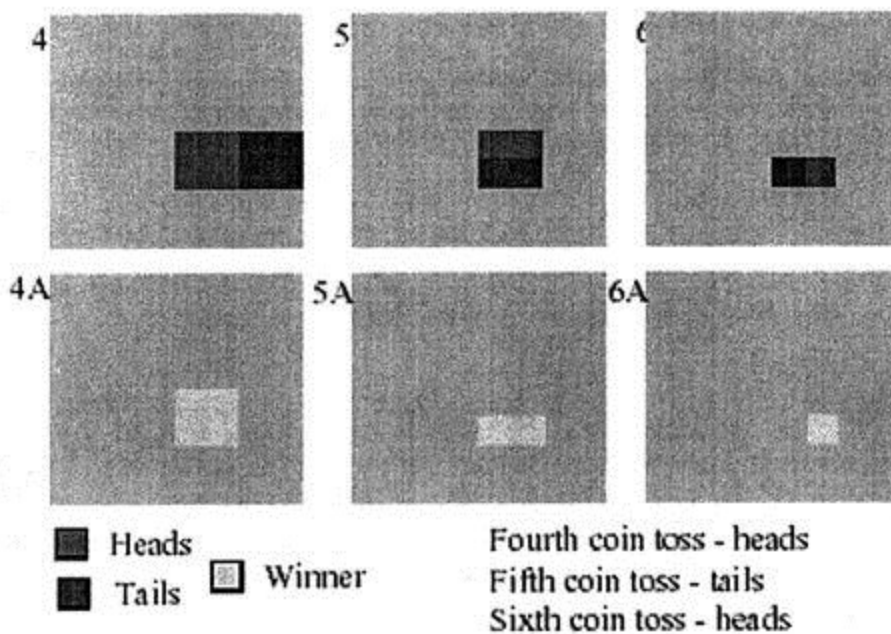
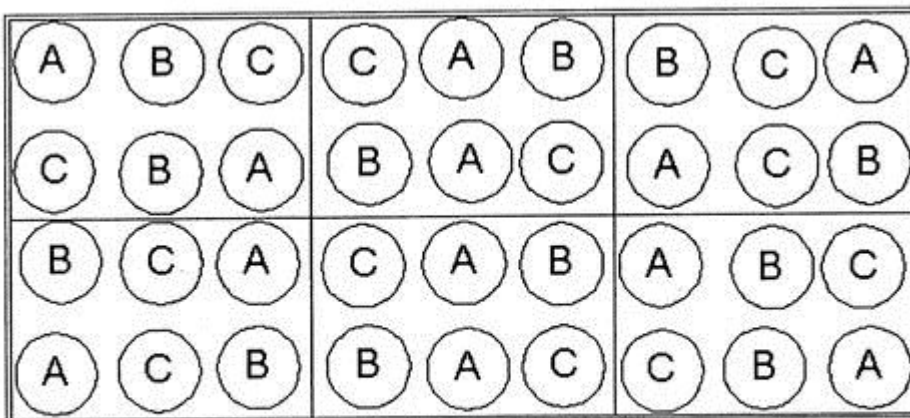


Figure 1C  
Example of Random Sample Composites

Systematic Composite Sampling

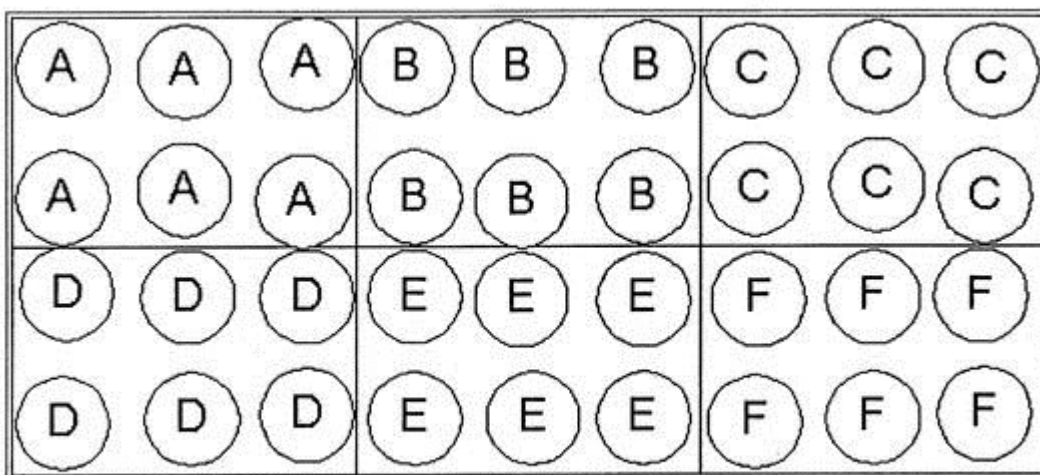


A systematic composite sampling design is illustrated in Figure 2. Each field sample collected at the “A” locations is pooled and mixed into one composite sample. The process is then repeated for “B,” “C,” “D” locations and so on. The relative location and size of each individual field sample (such as “A” ) should be the same within each block.



**Figure 2**  
**Example “A” of Systematic Sample Composites**

A second systematic composite design is illustrated in Figure 3. This sample design involves collecting and pooling samples from *within* a grid (See Figure 3). Each field sample collected at the “A” locations is pooled and mixed into one composite sample. The process is then repeated for “B,” “C,” “D” locations and so on. The relative location and size of each individual field sample (such as “A” ) should be the same within each block.



**Figure 3**  
**Example “B” of Systematic Sample Composites**

For both assessment and post-decontamination sampling, either simple random composite sampling or systematic composite sampling may be used where contamination is expected to be relatively evenly dispersed throughout a given area, as described above, except the consultant shall selectively choose sample locations that represent the highest potential contamination, in accordance with the hypothesis being tested.

## Composite Decision Level

If composite sampling is used, the following procedure shall be used for detecting hot spots to determine if one or more of the individual samples making up the composite could exceed the cleanup level, but remain undetected due to “dilution” that results from the compositing process.

The approach assumes the underlying distribution is normal and the composite samples were formed from equal-sized individual samples. In the following equations, CL represents the cleanup level that cannot be exceeded in any individual sample. It is assumed that the analytical limit of quantification, or quantitation limit (QL), is less than the cleanup level. For any laboratory result ( $X_i$ ) from a composite sample formed from individual samples ( $g$ ), the following rules shall be assumed:

- 1) If  $X_i < CL / g$  then no individual sample ( $g$ ) shall be deemed greater than the CL
- 2) If  $X_i > CL$  then at least one sample must be, and as many as all individual samples may be greater than the CL

If it is determined that one or more individual samples making up the composite exceeds the cleanup level, all areas represented by the composite sample shall be considered to exceed the cleanup level unless a discrete sample of any individual area demonstrates that the cleanup level has been met in that area.

## ATTACHMENT TO APPENDIX A: METHAMPHETAMINE LABORATORIES - SAMPLING METHODS AND PROCEDURES, SAMPLING THEORY

### Sampling Theory

The type of sampling used for stationary structures and vehicles described in this protocol is a type of sampling recognized as “authoritative” sampling. Authoritative sampling is a nonstatistical sampling design that does not assign an equal probability of being sampled to all portions of the population. Consultants using this protocol will have *a priori* knowledge of the property to be sampled. The *a priori* knowledge, in the hands of a competent consultant, permits immediate inclusion/exclusion of sampling areas, based on professional judgment. As such, the weight of validity of the data gathered with authoritative sampling is largely dependent on the knowledge and competency of the sampler.

With authoritative sampling, it is not possible to accurately estimate the concentration variance within a property as a whole. Also, due to its subjective nature, the use of authoritative sampling to demonstrate compliance with a regulatory standard is generally not advisable except in those cases that are anticipated to be well defined (small volumes of waste and where contaminants in the property under study is either well above or well below the cleanup level). The American Society for Testing and Materials (ASTM) Method D6311-98 (2003), Standard Guide for Generation of Environmental Data Related to Waste Management Activities: Selection and Optimization of Sampling Design, recognizes two types of authoritative sampling: judgmental sampling and biased sampling; both of these sampling theories are used in this protocol.

### Judgmental Sampling

The goal of judgmental sampling is to use process or site knowledge to choose one or more sampling locations to represent the “average” concentration within the context of the sampling area. Judgmental sampling designs can be extremely useful and cost-effective *if* the consultant choosing the sampling locations has sufficient knowledge of the history of the drug laboratory under study. It is recognized that the sampling method is not entirely objective since the consultant choosing the sampling locations could possibly intentionally distort the sampling by a prejudiced selection, or if their knowledge in the drug laboratory in question is wanting. In those cases, judgmental sampling can lead to incorrect results being presented to the consultant.

### Biased Sampling

*Biased* sampling is the type of authoritative sampling that intends not to estimate average concentrations or typical properties, but to estimate “worst” or “best” cases (as described in ASTM Method D6051-96 (2001), Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities). As described later in this protocol, the aim of the consultant performing post-decontamination sampling is to demonstrate the worst-case scenario in the drug laboratory. The term “biased,” as used here, refers to the collection of samples with expected high concentrations. For example, a sample taken at the source of the actual “cook,” known release, spill or storage area could serve as an estimate of the “worst-case” concentration found in the functional space. This information would be useful in identifying the contaminant and estimating the maximum level of contamination likely to be encountered during a cleanup. Biased sampling, while having the ability to cost-effectively generate information, has similar philosophical disadvantages to that of judgmental sampling.

### **Establishing Hypothesis Testing**

The foundation for the usefulness of any sampling protocol rests upon the establishment of appropriate data quality objectives (DQOs). Without such DQOs, sampling occurs in a vacuum and the strength of the results of the sampling may be extremely limited.

The DQOs are, in turn, driven by a thought process that proceeds from defining the problem, then quantifying the degree of the problem, defining what decisions are to be made based on the resulting data, and the degree of quality needed to ensure that the decision goals can be met. All sampling has error; all analysis has error. No realistic sampling and analysis protocol has a 100% guarantee of definitively characterizing any area or condition. Therefore, a realistic sampling and analysis protocol is one that minimizes error, and optimizes cost effectiveness, while increasing the probability that the DQOs will be met.

This sampling protocol begins with the end in mind; it is based on asking specific questions, and conducting sampling and analysis to answer those questions. In general, this protocol will rely heavily on maximizing the use of existing law enforcement, investigation, analytical and historical information (including process knowledge), thus reducing unnecessary, costly data-gathering activities, while at the same time ensuring that building occupants and the public are not placed at unnecessary risk. The protocol is not a substitute for professional judgment, but must be utilized by cognizant professionals in the application of their professional skills. Neither is the method a “cook-book” recipe that if followed, decontamination is guaranteed, and risks are assumed to be zero. The evaluation of any specific area must necessarily be based on the totality of the circumstances.

This protocol has been divided into two distinct sets of DQOs; one for the preliminary (pre-decontamination sampling) and one for the post-decontamination sampling. The essential difference between the two lies in the hypotheses that are being tested.

### Pre-decontamination sampling

In pre-decontamination sampling, the question that is being asked is “Is there evidence of the presence of methamphetamine production in this area?” The assumption (hypothesis) is that the area is clean i.e. “compliant,” and data will be collected to find support for the hypothesis. Data (such as samples) are collected to “prove” the area is compliant. Sampling, if it is performed, is conducted in the areas potentially containing the highest possible concentrations of contaminants. Any data that disproves the hypothesis, including police records, visual clues of production, storage, or use or documentation of drug paraphernalia being present, is considered conclusive, and leads the consultant to accept the null hypothesis and declare the area non-compliant. The strength of evidence needed to reject the hypothesis is low, and is only that which would lead a reasonable person, trained in aspects of methamphetamine laboratories, to conclude the presence of methamphetamine, its precursors as related to processing, or waste products.

#### Post Decontamination sampling

In post decontamination sampling, the question that is being asked is “Does this area contain contaminants in excess of the regulatory standard?” The hypothesis is the area is non-compliant, and data is collected to test the hypothesis. In theory, the ability to prove the hypothesis necessarily becomes more difficult as the area becomes cleaner; and virtually impossible to prove in an area that is completely devoid of contamination. The lack of data supporting the hypothesis leads the consultant to accept the null hypothesis and conclude that the area is compliant. Therefore, the role of the consultant in post decontamination sampling, is not to demonstrate that the area is “clean,” but rather, using bias sampling, to diligently attempt to prove, that the area is not clean. The strength of evidence needed to accept the null hypothesis is great; and failure to support the hypothesis results in confidence that risks have been greatly reduced.

#### **Decision Statement**

If, based on the totality of the circumstances, the consultant finds that insufficient evidence exists to support the hypothesis that any given area is non-compliant, that area shall be deemed to be compliant with section 25-18.5-103 (2), C.R.S., and shall be released. If objective sampling data indicates contamination is less than the cleanup level, that data may be used as *prima facie* evidence that insufficient evidence exists to support the hypothesis that any given area is non-compliant.

#### Composite Sampling

Composite sampling can be implemented as part of a statistical sampling design, such as simple random sampling and/or systematic sampling. The choice of a sampling design will depend upon the specific conditions of the drug laboratory being assessed.

##### Simple Random Composite Sampling

Figure 1 in Appendix A shows how composite sampling can be integrated into a simple random sampling design. In this figure, the sampled area could represent any surface or media about which a decision must be made (such as a series of walls, or carpeting or even contaminated soils). Randomly positioned field sample composites can themselves be randomly grouped together into composite samples. The set of composite samples can then be used to estimate the mean and the variance of the results. Because the compositing process is a mechanical way of averaging out spatial variabilities, we assume <sup>1</sup> the resulting concentration data to be more normally distributed than individual samples <sup>2</sup>. This is especially advantageous because the assumption of the statistical tests in this protocol is that the underlying data approximate a Gaussian distribution.

1 Based on the central limit theorem which states that if a population is repeatedly sampled, the means of all the sampling events will tend to form a normal distribution, regardless of the shape of the underlying distribution.

2 Exner JH, Keffer WD, Gilbert RO, Kinnison RR. A Sampling Strategy for Remedial Action at Hazardous Waste Sites: Clean-up Soil Contaminated by Tetrachlorodibenzo-p-Dioxin” Hazardous Waste & Hazardous Materials 2(2):503-21, 1985.

The sample locations can be selected by any number of methods. The “system of halves” as described in 40 CFR §761.306 is one example discussed in Appendix A and illustrated in Figures 1B and 1C in that appendix.

### Systematic Composite Sampling

An example of one kind of systematic composite sampling design is shown in Appendix A, Figure 2. The design can be used to estimate the mean concentration because each composite sample is formed from field samples obtained across the entire sampled unit (a wall, or a carpet, for example). Each field sample collected at the “A” locations is pooled and mixed into one composite sample. The process is then repeated for “B,” “C,” “D” locations and so on. The relative location and size of each individual field sample (such as “A” ) should be the same within each block.

A second type of systematic composite involves collecting and pooling samples from *within* a grid (See Appendix A, Figure 3). If there is spatial correlation between the grid blocks, compositing within grids can be used to estimate block-to-block variability or improve the estimate of the mean within a block if multiple composite samples are collected within each block. In fact, compositing samples collected from localized areas is an effective means to control “short-range” (small-scale) heterogeneity. When this type of compositing is used on localized areas in lieu of “grab” sampling, it is an attractive option to improve representativeness of individual samples.

For post decontamination, any of the above may be used, except, the consultant will purposely attempt to “high-grade” the samples (selectively choosing sample locations that represent the highest potential contamination, in accordance with the hypothesis being tested).

### Composite Decision Level

One disadvantage of composite sampling is the possibility that one or more of the individual samples making up the composite could be “hot” (exceed the “cleanup level” (CL)), but remain undetected due to “dilution” that results from the pooling process. If the sampling objective is to determine if any one or more individual samples is “hot,” composite sampling can still be used.

The procedure for detecting hot spots using composite sampling is provided in Appendix A. The approach assumes the underlying distribution is normal and the composite samples were formed from equal-sized individual samples. Let CL be the “cleanup level” that cannot be exceeded in any individual sample.

If compositing is used then the number of samples that make up the composite should be limited to avoid overall dilution below the analytical limit. It is possible for a composite sample to be diluted to a concentration below the quantitation limit if many of the individual samples have concentrations near zero and a single individual sample has a concentration just above the cleanup level. The maximum number of identically sized individual samples (g) that can be used to form a composite shall not exceed the cleanup (CL) divided by the quantitation limit (QL). As a practical matter, the number of individual samples used to form a composite should not exceed five discrete samples of equal area.

### Glossary of Terms

#### **biased:**

the systematic or persistent distortion of a measurement process which causes errors in one direction (i.e., the expected sample measurement is different than the sample's true value).

#### **Data Quality Objectives (DQOs):**

qualitative and quantitative statements derived from the DQO Process that clarify assessment objectives, define the appropriate type of data, and specify the tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

**Data Quality Objectives Process:**

a Quality Management tool based on the Scientific Method to facilitate the planning of environmental data collection activities. The DQO Process enables planners to focus their planning efforts by specifying the intended use of the data (the decision), the decision criteria (cleanup level) and the consultant's tolerable decision error rates. The products of the DQO Process are the DQOs.

**decision error:**

an error made when drawing an inference from data in the context of hypothesis testing, such that variability or bias in the data mislead the consultant to draw a conclusion that is inconsistent with the true or actual state of the population under study.

**g:**

any individual sample collected for submission for analysis, either as a discrete sample or as part of a composite sample.

**hypothesis:**

a tentative assumption made to draw out and test its logical or empirical consequences.

**mean:**

(i) a measure of central tendency of the population (population mean), or (ii) the arithmetic average of a set of values (sample mean).

**measurement error:**

the difference between the true or actual state and that which is reported from measurements.

**null hypothesis:**

the default alternative conclusion that must be adopted if insufficient data exists to support the hypothesis.

**population:**

the total collection of objects, or media to be studied and from which a sample is to be drawn.

**sampling:**

the process of obtaining representative samples and/or measurements of a subset of a population. Sampling is a model; inherent in sampling is error, known or unknown.

**sampling design error:**

the error due to observing only a limited number of the total possible values that make up the population being studied. It should be distinguished from errors due to imperfect selection; bias in response; and errors of observation, measurement, or recording, etc.

**variance:**

a measure of (i) the variability or dispersion in a population (population variance), or (ii) the sum of the squared deviations of the measurements about their mean divided by the degrees of freedom (sample variance).

**$X_i$ :**

the laboratory analysis result for any discrete or composite sample submitted for analysis.

**References**

The following documents were consulted and used in the preparation of this protocol.

American Society for Testing and Materials (ASTM) Method D5756-02 (November 2002), Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Mass Concentration ,

American Society for Testing and Materials (ASTM) Method D6044-96 (2003), Standard Guide for Representative Sampling for Management of Waste and Contaminated Media .

American Society for Testing and Materials (ASTM) Method D6051-96 (2001), Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities .

American Society for Testing and Materials (ASTM) Method D6311-98 (2003), Standard Guide for Generation of Environmental Data Related to Waste Management Activities: Selection and Optimization of Sampling Design .

Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup, EPA-560/5-86-017 (May 1986).

Guidance for the Data Quality Objectives Process, EPA QA/G-4 EPA/600/R-96/055 (September 1994).

RCRA Waste Sampling Draft Technical Guidance Planning, Implementation, and Assessment

EPA530-D-02-002 (August 2002).

**APPENDIX B: METHAMPHETAMINE LABORATORIES - ANALYTICAL METHODS**

**Purpose**

The purpose of this appendix is to establish standard analytical methods and procedures for use in identifying and quantifying contaminants resulting from the manufacture, storage or disposal of methamphetamine related chemicals and wastes.

**Analytical Methods**

The following analytical methods shall be used to determine the concentrations of chemicals in samples collected at properties used as drug labs:

1. Analysis of wipe samples and microvacuum samples for methamphetamine shall be conducted using one of the laboratories listed in this appendix, or a laboratory that uses Forensic applications employing an Isotopic Dilution approach with the d-5, d-8, or d-14 deuterated methamphetamine as an internal standard, and external calibration with authentic methamphetamine.
2. Analysis of wipe samples and microvacuum samples for iodine shall be conducted using Method 9021 or Method 6020 in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.
3. Analysis of wipe samples for lead shall be conducted using NIOSH Method 9100
4. Analysis of vapor samples for mercury shall be conducted using NIOSH Method 6009. Real time monitoring by cold vapor atomic absorption or jerome gold film technologies may also be used.

The following analytical methods shall be used to characterize liquid wastes associated with methamphetamine labs:

1. VOCs using Method 8260B in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.
2. Ignitability/flash point by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (or Method 1010 in EPA SW-846), or Setaflash Closed Cup Tester, using the test method specified in ASTM standard D-3278-78 (or Method 1020A in EPA SW-846).
3. Corrosivity as determined by the pH electrometric measurement Method 9040B in EPA Publication SW-846, by corrosivity by steel using Method 1110 in EPA Publication SW-846.
4. Reactivity using Method 9014/9034 in EPA Publication SW-846.

### **Analytical Laboratories**

The following analytical laboratories may be used to perform analysis of wipe samples or microvacuum samples for methamphetamine:

1. Alliance Analytical Laboratories, LLC  
401 East "s" Street  
Yakima, WA 98901
2. Alturas Analytics, Inc.  
1282 Alturas Drive  
Moscow, ID 83843
3. Analytical Chemistry, Inc.  
4611 South 134th Place, Suite 200  
Tukwila, WA 98168
4. Freedman and Bruya  
3912 16th Avenue West  
Seattle, WA 98119



5. Legacy MetroLab  
1225 Northeast 2nd Avenue  
Portland, OR 97232

6. Sherry Laboratories, Inc.  
6825 East 38th Street  
Tulsa, OK 74145

## **APPENDIX C: METHAMPHETAMINE LABORATORIES - VENTILATION SYSTEM DECONTAMINATION**

### **Purpose**

The purpose of this appendix is to establish minimum requirements for the decontamination of ventilation systems at buildings and structures that have been used as drug laboratories.

### **Decontamination Protocol**

Decontamination of ventilation systems shall be conducted by a ventilation contractor experienced in the decontamination of ventilation systems in structures used as drug laboratories. At a minimum, the ventilation contractor shall:

1. Perform a walk-through of the structure prior to initiation of the project to establish a specific plan for decontamination of the ventilation system.
2. Follow health and safety procedures, in accordance with OSHA requirements, to protect workers and others in the vicinity of the structure during the decontamination process.
3. Place protective coverings in areas where work is being performed, including plastic or drop cloths around each area where the duct is penetrated.
4. Shut off and lock out all air handler units before working on each air conveyance system.
5. Perform a visual inspection of the interior ductwork surfaces and internal components.
6. Draw a negative pressure on the entire ductwork, using HEPA exhausted vacuum filters, throughout the cleaning process.
7. Remove and clean all return air grills.
8. Beginning with the outside air intake and return air ducts, clean the ventilation system using pneumatic or electrical agitators to agitate debris into an airborne state. Additional equipment may be also be used in the cleaning process, such as brushes, air lances, air nozzles, and power washers. Controlled containment practices shall be used to ensure that debris is not dispersed outside the air conveyance system during cleaning.
9. Open and inspect air handling units, and clean all components.
10. Remove and clean all supply diffusers.
11. Clean the supply ductwork using the techniques described in item 8 above.
12. Reinstall diffusers and grilles after cleaning is complete.
13. Seal shut access points used for agitation purposes.

14. Bag and label all debris, including any filters, and properly dispose of at a landfill.

## **APPENDIX D: METHAMPHETAMINE LABORATORIES - INDIVIDUAL SEWAGE DISPOSAL SYSTEMS**

### **Purpose**

The purpose of this appendix is to establish a protocol for field screening, sampling, and analysis of individual sewage disposal systems (ISDSs) to determine if wastes associated with drug laboratories has been disposed of in the ISDS. The appendix provides further guidance regarding the proper characterization and disposal of the contents of septic tanks that contain wastes from drug labs.

### **Background**

The most common types of drug lab wastes that might be expected in an ISDS include:

1. Solvents (e.g., toluene, xylene, alcohol, acetone);
2. Petroleum distillates (e.g., paint thinner, white gas);
3. Corrosives (e.g., sulphuric acid, muriatic acid, sodium hydroxide solutions); and,
4. Mixtures with residual ephedrine, methamphetamine, iodine or red phosphorus.

Field screening and sample collection shall be conducted to confirm or deny the presence of methamphetamine waste, and to ensure proper disposal of any methamphetamine waste identified.

### **Field Screening**

Field screening of septic tanks shall be conducted if there is evidence that drug lab wastes may have been disposed of into an ISDS. Evidence of drug lab wastes disposal into an ISDS includes, but is not limited to, the following:

1. Witness statements;
2. Stained or etched sinks, bathtubs, toilets;
3. Chemical odors coming from the ISDS plumbing or tank; or
4. Visual observations of unusual conditions within the septic tank ("dead tank" ); or, stressed or dead vegetation in a drain field.

Initial field screening shall consist of the following:

1. Monitoring the septic tank for volatile organic compounds (VOCs) using a photo ionization detector (PID) or a flame ionization detector (FID).
2. Testing the pH of liquid in the septic tank using pH paper or a pH meter.

Additional field screening may be conducted, at the discretion of the contractor, to further investigate the possible presence of drug lab waste.

### **Sample Collection**

If field screening indicates that the ISDS has been impacted by drug lab wastes, samples shall be collected from the septic tank to determine if the liquids in the tank contain a hazardous waste. Samples shall be collected according to the requirements of the analytical method being used and the following protocol:

1. Prior to sampling, the septic tank must have been sufficiently excavated to indicate whether the tank consists of one or two chambers.
2. Samples from single chamber tanks shall be collected from the baffle on the outlet end of the tank.
3. Samples from dual chamber tanks shall be collected from the baffle on the outlet end of chamber one.
4. Samples must be representative of the wastes found in the septic tank. Sampling procedures may include the use of drum thieves, sludge judges or equivalent equipment. The instructions for the correct usage of the sampling device shall be followed.
5. Remove access cover from the first (or only) chamber and locate outlet baffle.
6. Move any floating surface matter away from the insertion point of the sampling device. Do not collect any matter in the sampling device.
7. Insert the sampling device into the tank, lowering it until it hits the bottom.
8. Trap the sample inside the sampling device.
9. Remove the sampling device and fill the laboratory supplied sample containers. The specific volume and type of sample container will be determined based on the type of analysis desired. For VOC analysis, two 40ml vials shall be filled, leaving no headspace.
10. Replace access cover at the completion of sample collection.
11. Samples may be collected in laboratory preserved bottles, or in unpreserved bottles. If the samples are collected in unpreserved bottles, the laboratory must be notified that the samples are unpreserved.
12. Sample containers shall be placed in a cooler with enough ice or ice packs to maintain a temperature of 4 ° C.
13. A Chain of Custody Record shall be maintained from the time of sample collection until final disposition. Every transfer of custody shall be noted and signed for and a copy of the record shall be kept by each individual who has signed it. Samples shall be sealed, labeled, and secured. All samples collected shall be transported directly to the laboratory. All sample documents shall be retained for the project record.

### **Waste Characterization**

The contents of septic tanks that contain waste from drug labs are solid wastes. Prior to disposal, a hazardous waste determination must be made in accordance with 6 CCR 1007-3 Section 261.20 through 261.24. Methamphetamine wastes in septic tanks will typically not be considered to be listed hazardous wastes (P, U, or F-listed) 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 following analysis shall be conducted to determine if an ISDS has been impacted by methamphetamine lab wastes, and if the septic tank contains a characteristic hazardous waste:

1. VOCs using Method 8260B in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.
2. Ignitability/flash point by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (or Method 1010 in EPA SW-846), or Setaflash Closed Cup Tester, using the test method specified in ASTM standard D-3278-78 (or Method 1020A in EPA SW-846).
3. Corrosivity as determined by the pH electrometric measurement Method 9040 in EPA Publication SW-846, by corrosivity by steel using Method 1110 in EPA Publication SW-846.
4. Reactivity using Method 9014/9034 in EPA Publication SW-846.

### **Waste Disposal**

Septic tank contents containing drug lab waste that have been determined to be a hazardous waste shall be disposed of in accordance with the Colorado Hazardous Waste Regulations (6 CCR 1007-3). Septic tank contents containing drug lab waste that have been determined not to be hazardous waste shall be disposed in accordance with the Colorado Solid Waste Regulations (6 CCR 1007-2), and local requirements.

### **RELEASE INVESTIGATION AND REMEDIATION**

If sampling provides evidence that hazardous waste has been disposed of in the ISDS, an investigation of potential environmental contamination shall be conducted. The investigation and cleanup of soil, surface water and groundwater contamination resulting from disposal of methamphetamine lab wastes into an ISDS shall be conducted in accordance with either the Colorado Hazardous Waste Regulations, or the Colorado Solid Waste Regulations, as appropriate based on sampling results, and with Water Quality Control Commission Regulations 31 and 41. Specific investigation requirements shall be determined through consultation with the Department's Hazardous Materials and Waste Management Division. Guidance on soil and groundwater investigations can be found in the Department of Public Health and Environment, Hazardous Materials and Waste Management Division (May 2002), Corrective Action Guidance Document and the EPA Environmental Investigations Standard Operating Procedures and Quality Assurance (EISOPQA) Manual.

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### **Editor's Notes**

### **History**