“Meth and the Madness”
Remediation of Clandestine Drug Labs
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Phoenix Police Department
The Madness

Meth “Conversion Lab” – refining imported mexican meth to “ice”
Discovered June 22, 2005
Initially looked like a gas explosion
Severely burned man was witnessed running from the fire. He told firefighters he “heard a noise” and when he turned on the light switch, the house blew up.
Front & Garage Doors
Bedroom (Blast Origin) Window
North End of House
East Side Of House
Patio Doors (Note Damage to Aluminum Frame)
South End of House
Kitchen Window
Stove with “Active Pot”
Living Room
Front Bathroom
Hall Closet
Bathroom, Shower Stall
Acetone Can from Rubble
Plenty of Evidence Survived
Neighbors reported that 4 young males were living in the house. At the time of this incident it appears that only one was at home.

The house had very little furniture and the only cooking utensils appeared to be for the lab. The garbage was full of fast food wrappers.

The young man that was in the house when it exploded suffered burns over 75% of his body and did not survive.
Objectives

- Understanding Police actions in remediation activities
- Discuss issues and technologies used in decontamination
- Address varying and conflicting opinions with approved practices for state and federal guidelines
- Discuss remediation and returning a property to “safe and healthy”
Where are CDLs found?

- Private property – single family home
- Residential properties – apartments or multiple unit dwellings
- Garage or non-residential structure – garage, barn, shed, multi-unit storage facilities
- Motor home or trailer home
- Vehicles
- Underground – dugouts, caves
- Super labs – high production facilities
Contamination

- Condition of structure
  - Lab discovered after explosion and fire VS. a seized lab without structural damage

- Degree of contamination will vary on
  - type of cook
  - number of cooks performed
  - length of time the area has been used as a lab
Residual contamination

- During cook – large amounts of contaminants are released into the air
- Production chemicals are spilled and released into the air
  - Residues of iodine, VOCs, metals, acids, bases
- Methamphetamine
  - 5,500 ug/m³ in air
  - 16,000 ug/100 cm² (148,608 µg/ft²) on surfaces
  - 11,900 µg/ft² in carpeting
Residual contamination

- Liquid spills on floors, walls, appliances, countertops, other non-porous surfaces
- Surface contamination on non-porous surfaces
Residual contamination

- Airborne contaminants absorbed into or on:
  - Porous materials like rugs, upholstery, curtains, drywall, clothing, mattresses, children’s toys, cat litter boxes, kitchen cabinetry, cooking utensils, pans, etc.
  - HVAC systems including filters, insulating materials, ceiling tiles, range vents
Residual contamination

- Liquids wastes poured into sinks, toilets, bathtubs leaving residue on items and contaminating waste water systems or septic tanks
- Clogged and contaminated toilets, p-traps,
- Often wastes are dumped into backyards leaving contaminated puddles or soil
Residual contamination

• Not industrial setting – these are usually occupied homes or living spaces!
• Chemicals used in the process can be volatile (ex: iodine, acetone, ammonia, toluene, benzene, methanol, etc.)
• Also acids and bases – standing puddles are often found to be caustic
• Septic systems are especially problematic – often highly contaminated
Police Actions & Multi-Agency approach

- Following the discovery or "bust" of a CDL, Law Enforcement will:
  - Arrest suspects (LE)
  - Remove endangered children (CPS)
  - Coordinate removal of animals (Animal Control)
  - Perform DEA funded "gross contamination" removal
  - Remove explosive or "booby-trap" devices
Gross Contamination

- Chemicals
- Glassware ("cook" items)
- Remaining process solutions
- Items deemed evidence
- Better described as "initial assessment and evidence removal"
- 1 lb meth manufactured = 6 lbs waste
Notification

• Requirements vary by state
• Notify property owner
• Post notice of contamination (formal notice vs. Police Tape) or condemnation of property until remedial action taken – some states
• Notify Health Dept (County, State) – some states
Cleanup requirements

- Formal cleanup requirements or guidelines in statutes – WA, AZ, CO, MN, TN, AR, AK, CA, ID, UT
- Others provide guidance for property owners often patterned off states with requirements or direction to PH or EQ to make guidelines (NC, OR, SD)
- Others seek restitution for cleanup from criminal (NC), civil proceedings (OH), or property liens (CA)
- Some specifically address environmental hazards and residual hazards to future property owners or occupants (AZ, WA, OR)
Cleanup requirements (cont)

- Most states require LE to post crime scene tape and refer Property Owner to website or Health department for guidance
- Provide time limit for Property Owner to take action (10 – 90 days)
- Some states require Properly Trained or Qualified Contractor
- Some specify CIH, RPIH, “qualified industrial hygienist” or similar qualified professional to evaluate “cleanliness”
- IL – suggests consulting a CIH for guidance on cleanup
Cleanup Requirements - cont

• Disparity between states with specific guidelines and cleanup standards
• No $$$ supporting enforcement or cleanup efforts
• On-going research on residual contamination (meth residue, precursor/process/waste chemicals)
• Varying sampling requirements – wipe, soil, air
• All states recommend visual reference for “clean”
Cleanup Standards

• TLVs or PELs are not usually protective enough considering exposure group
• EPA has some applicable standards but not for every chemical of concern (COC)
• Regulated levels vary significantly among regulated states and no specific federal guidelines exist although extrapolation is possible
<table>
<thead>
<tr>
<th>State</th>
<th>Methamphetamine</th>
<th>VOCs (in air)</th>
<th>Mercury</th>
<th>Lead (wipe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN</td>
<td>0.1 µg/100 cm²</td>
<td>1 ppm</td>
<td>≤50 ng/m³</td>
<td>≤40 µg/ft²</td>
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<tr>
<td>AR</td>
<td>0.5 µg/ft²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>0.1 µg/100 cm²</td>
<td></td>
<td>≤50 ng/m³</td>
<td>≤20 µg/ft²</td>
</tr>
<tr>
<td>WA</td>
<td>≤0.1 µg/100 cm²</td>
<td>1 ppm</td>
<td>≤50 ng/m³</td>
<td>≤20 µg/ft²</td>
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<tr>
<td>AZ</td>
<td>0.1 µg/100 cm²</td>
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<td>3.0 µg/m³</td>
<td>4.3 µg/100 cm²</td>
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<tr>
<td>ID</td>
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<td>0.3 µg/m³</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>0.5 µg/ft²</td>
<td></td>
<td></td>
<td>≤40 µg/ft²</td>
</tr>
<tr>
<td>MN</td>
<td>1.0 µg/ft²</td>
<td></td>
<td></td>
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</tbody>
</table>
Sampling Methods

Methamphetamine:
- EPA SW-846 analytical method 8270C-Modified (Surface wipe sample)

Lead:
EPA Method 6020 (Surface wipe)

Mercury:
EPA Method 7471A (Air sample)

VOCs:
PID with lamp appropriate to suspect VOCs
Sampling Methods

Corrosives:

Surface pH testing (acceptable range of pH 6 to 8) performed with pH paper

Soil:

Applicable state/county soil remediation guidelines

Septic Tank/Contaminated

Surface & Ground Water:

Applicable VOC liquid samples (ex: AZ 700 ug/l Acetone)
Other Sampling

As determined by IH and by state guidelines including but not limited to:

- Ephedrine
- Pseudoephedrine

Other Chemicals of Concern (ex: Colorado lists air exposure guidelines for 27 additional COCs)
Wipe Sampling

Minnesota Pollution Control Agency Study

Conclusions
- Meth wipe sampling not necessarily indicative on total mass meth on or in material
- Serial wipe sampling “mines” meth from latex paint
- Meth wipe sampling varies by building material
- Pre and Post sampling must be consistent to provide validity

Changes: Exposure minimization, performance based, sampling to show presence and on non-porous surfaces only
Sampling Strategies will depend on:

1. Site information gathered prior to clean-up
2. Chemicals and methods in process
3. Visual appraisal of extent and severity of contamination
4. IH’s best judgment in rendering property safe
5. Applicable state/local guidelines
Sampling strategies (cont)

- Pre-sampling YES or NO?
- Cost benefit vs. Requirements
- Already known contamination
- Establish level of contamination for demonstration of decon
- Ex: WA state requires pre-sampling
## WA Pre/Post-Decontamination Sampling Table

<table>
<thead>
<tr>
<th>Sample ID Number</th>
<th>Sample Location**</th>
<th>Analyte</th>
<th>Area Sampled</th>
<th>Pre Decon Results</th>
<th>Post Decon Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM1</td>
<td>Living room</td>
<td>Meth</td>
<td>400 cm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM2</td>
<td>Bathroom ceiling fan</td>
<td>Meth</td>
<td>100 cm²</td>
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<tr>
<td>SM3</td>
<td>Septic (strong solvent odor detected)</td>
<td>VOC (to be reported in ppm)</td>
<td>1 quart</td>
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<tr>
<td>SM4</td>
<td>Kitchen</td>
<td>Meth</td>
<td>400 cm²</td>
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<tr>
<td>SM5</td>
<td>Sample Blank (for QA/QC)</td>
<td>Meth</td>
<td></td>
<td></td>
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</table>
Decontamination Process (In General)

• Determine guidelines for the state in which you are working – generally available on health department websites

• Basics steps similar to all states

• Same process as remediation of Hazardous Waste site with multiple types of contamination, hazards
Initial Site Assessment

• Determine type of lab, length and number of cooks (TN provides Tier guidance specific for this criteria, others provide guidance with professional judgment)
• Consult LE including Drug Lab Seizure reports, Haz Mat Manifests, Evidence Inventories for CDL
• Determine primary processing or “cook” sites – kitchens, sheds, garage, bedroom
• Determine chemical disposal & storage areas – chemical disposal in bathroom, sinks, backyards
Initial Site Assessment

• Determine secondary contamination pathways – migration by high traffic, ventilation, plumbing, common areas (hotel, apartment)
• Create site map & workplan
• Perform visual assessment of area noting observable contamination
• Use good safety practices (power? Gas? Air monitoring? Structural integrity?)
Standard Cleanup Practices

• Ventilate – recommendation to heat up prior to remediation (recs vary 70 – 90 degrees for 48 hours to 2 weeks) and then exhaust area with windows/doors open and exhaust fans (additional days)

• Test VOC levels prior to beginning work
Standard Cleanup Practices

• Porous items – general guideline is to remove and dispose of these items including:
  – Clothing, Household linens, draperies
  – Upholstered furniture
  – Paper goods & books
  – Drywall, Ceiling materials
  – Carpeting
  – Appliances
Standard Cleanup Practices

• Non-Porous items – judgment call based on:
  – staining or etching
  – type of material
  – ability to decon with detergent and water

Includes: sinks, bathtubs, toilets, plumbing fixtures, tile, linoleum, counter-tops, walls, etc.
Standard Cleanup Practices

• Encapsulation – professional judgment on oil based/latex based paints for encapsulation of surfaces and practicality verses replacement

• Detergent washing – for non-porous interior surfaces not otherwise visibly stained, valuable porous articles (may be extremely costly or not possible depending on contamination)
HVAC systems

- Consider connections especially in multi-unit facilities
- Replace all filters
- Remove vents and clean including surfaces near registers (supply and return)
- Clean unlined ductwork
- Caution with lined ducts
- Assess AC and Furnace
Outdoors

- Wastes are often dumped or burned on sites and occasionally buried
- Soil
- Septic systems
- Surface waters
- Groundwater & Well-water contamination
- Exterior of the structure for visible contamination
Post cleanup

• Perform post-cleanup sampling using state guidelines or determine acceptable criteria if not provided in your area
• Follow methods previously discussed
• Post-cleanup notification procedures for your area (i.e. health department, Law Enforcement agency, etc.)
Reality of Cleanup

- Guidelines exist but property owner can’t afford cleanup
- Majority of sites go unremediated to clearance or recommended standards
- CA – idea of lien on property
- Other states – if property is not cleaned by property owner it becomes property of state or local jurisdiction
IH Qualifications/Knowledge

- Sampling for air, surface, and soil contaminants
- Type of lab, chemicals used, how they persist in the environment
- HazWaste operations & remediation
- Certification – asbestos & lead
- PPE/Respirator selection
- Ensure contractor meets applicable standards and works safely
IH issues

- Ethical responsibilities – qualified to practice
- Responsibility to return property to “safe for human occupancy”
- Different exposure potentials >8-10 hour workday
  - Children: especially small children near/on floor, hand to mouth habits
  - Eating, sleeping, living in home
Bottom-line

• Use best practice for determining clean even if no state guidelines or requirements exist or existing guidelines are insufficient

• Be aware of limited funds for property owners

• New legislation – limiting access to precursors especially Ephedrine & Pseudoephedrine