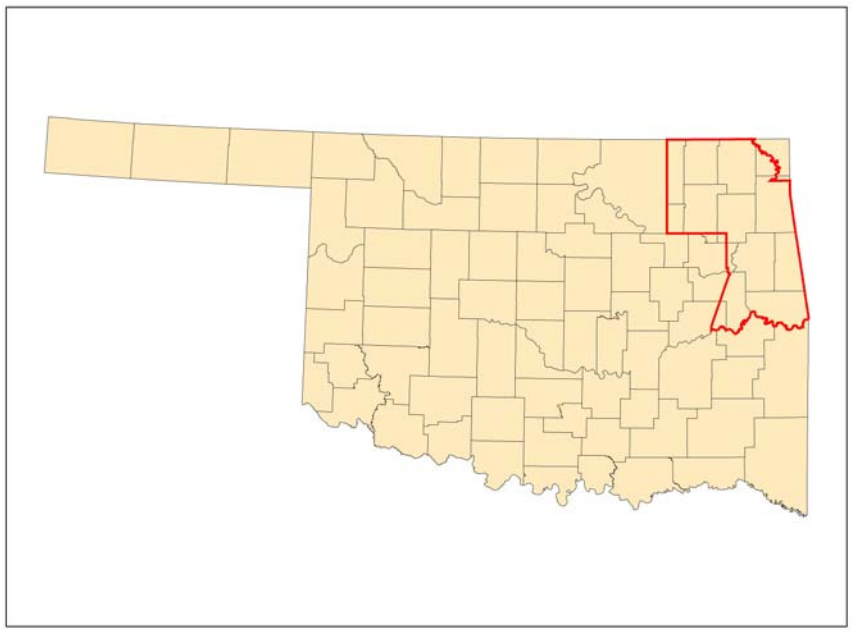
Cherokee Nation

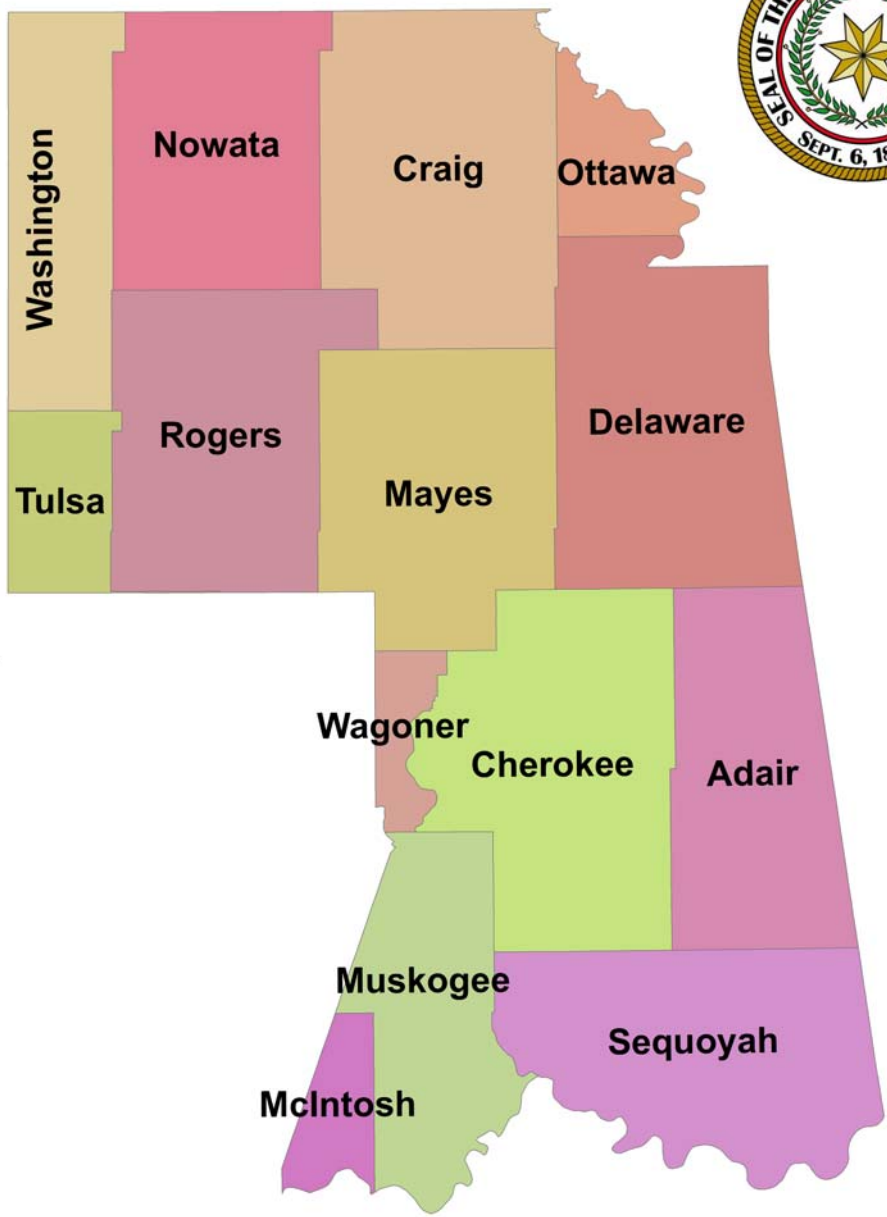
Methamphetamine Lab Assessment

National Forum on Tribal Environmental Science

September 24-29 Quinault Beach Resort & Casino

Cherokee Nation of Oklahoma





Our Epidemic

- Meth lab seizures have gone up 577 percent nationally since 1995.
- Oklahoma meth cases have gone up more than 8,000 percent since 1994.
- Oklahomans are 42 percent above the national average in all age groups for meth use.

Source: Oklahoma State Bureau of Investigation

Our Epidemic

- 89% of the children removed from meth labs in 2003, in Tulsa, Oklahoma tested positive for methamphetamine.

Community Impacts

Tax dollars expended for -

- Law enforcement responses
- Court processes
- Court ordered drug rehab
- Incarceration
- Child Protective Services intervention
- Child healthcare

Community Impacts

Tax dollars expended for -

- Child foster care
- Cleanup of hazardous materials
- Disposal of hazardous waste
- Environmental restoration

One Lab = $350,000

Community Impacts

- Between 1999 and 2004, there were 4,219 reported meth lab incidents in Oklahoma.
- Law enforcement predicts that for every one identified clandestine lab, there are approximately 8 to 10 unidentified illegal labs.

4,219 x 8 = 33,752

Crime Rate

- Increase in property crimes – burglary, theft, and vandalism.
- Increase in violent crimes – assault, robbery, homicides, domestic abuse, and child abuse.

Global Epidemic!

2006 “The Most Abused Drug on Earth.”

U.N. World Drug Report calls meth the most abused drug on earth, and the world’s 26 million meth addicts equals the combined number for cocaine and heroin users.

Cherokee Nation Reacts

Not in

Our Nation!

Initiative Timeline

- **2002** – Cherokee Nation Office of Environmental Protection (OEP) received request to investigate former meth lab.
- **2003** – OEP staff obtained clandestine drug laboratory investigation training through the State of Oregon's Department of Human Services.
- **2003** – OEP staff began assessing former residential meth sites for the Housing Authority of the Cherokee Nation.

HACN Homes

Initiative Timeline

- **2003** – OEP worked with the Cherokee Nation's Marshal Service to secure a grant from the US Department of Justice.
- **2003** – The Methamphetamine Task Team was formed.
- **2004** – OEP presented the *Regional Methamphetamine Conference*, in Tulsa, OK.
- **2004** – OEP began conducting community education programs.

Initiative Timeline

- **2005** - Cherokee Nation formed the Cherokee Nation Anti-Meth Coalition (CNAMC).
- **2005** – OEP merged with the Cherokee Nation Office of Environmental Services, forming the current office Cherokee Nation Environmental Programs (CNEP).
- **2006** – CNEP constructed and began teaching the course *Meth Lab Hazard Assessment.*

The Course

Instructors:

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Environmental Specialist III
Cherokee Nation Environmental Programs

Brad Asbill, CHMM
Environmental Specialist II
Cherokee Nation Environmental Programs

Course Contents

- Methamphetamine Introduction
- Federal, State & Local Programs
- Meth Lab Identification
- Hazard Constituents for Making Meth
- Illegal Manufacturing Methods
- PPE & Worker Health/Safety
- Sampling Equipment
- Sampling Methodology
- Site Decontamination

Acknowledgements

- State of Oregon Department of Human Services, **Drug Lab Cleanup Program**
- Washington State Department of Health, **Clandestine Drug Lab Program**
- California Office of Environmental Health Hazard Assessment.
- University of Arizona's College of Public Health.

Hazardous Constituents

Hazardous Substances

What is the difference between Hazardous Constituents and Hazardous Byproducts or Hazardous Waste?

- Constituents are the precursor chemicals required to produce methamphetamine.
- Byproducts/Waste are the substances created during the illegal manufacturing of methamphetamine.

Hazardous Substances

40 CFR RCRA Hazardous Waste Characteristics:

- Ignitability – flashpoint of <140^{o} F
- Corrosivity – pH <2 or >12.5
- Reactivity – unstable under normal conditions.
- Toxicity – leaches toxic chemicals in excess of regulatory levels. This is evaluated by performing the Toxicity Characteristic Leaching Procedure (TCLP).

Hazardous Constituents

Ignitability, Corrosivity, Reactivity, Toxicity-

Most of the chemicals used in the illegal manufacturing of methamphetamine exhibit at least one of these characteristics.

Hazardous Constituents – Ignitability

- Both the Red P and the Nazi methods employ some type of ignitable solvent or liquid.
- Solvents are used to extract ephedrine from the tablets and for separation of the finished meth product.
- Most have toxic effects as well.
- Greatest danger from ignitable solvent is when the lab is active (residents, law enforcement).

Hazardous Constituents – Ignitability

Ignitability – flashpoint of <140º F

- Flash Point – is the lowest temperature at which a liquid gives off enough vapor to form an ignitable mixture with the air.

Gasoline	-45 F
Acetone	0 F
Benzene	12 F

Hazardous Constituents – Ignitability

- **UEL** – the maximum concentration of a ignitable substance in air that will support combustion. Concentrations above the UEL are “too rich” to burn.
- **LEL** – the lowest concentration of a flammable substance in air that will support combustion. Concentrations below the LEL are “too lean” to burn.

Hazardous Constituents – Ignitability

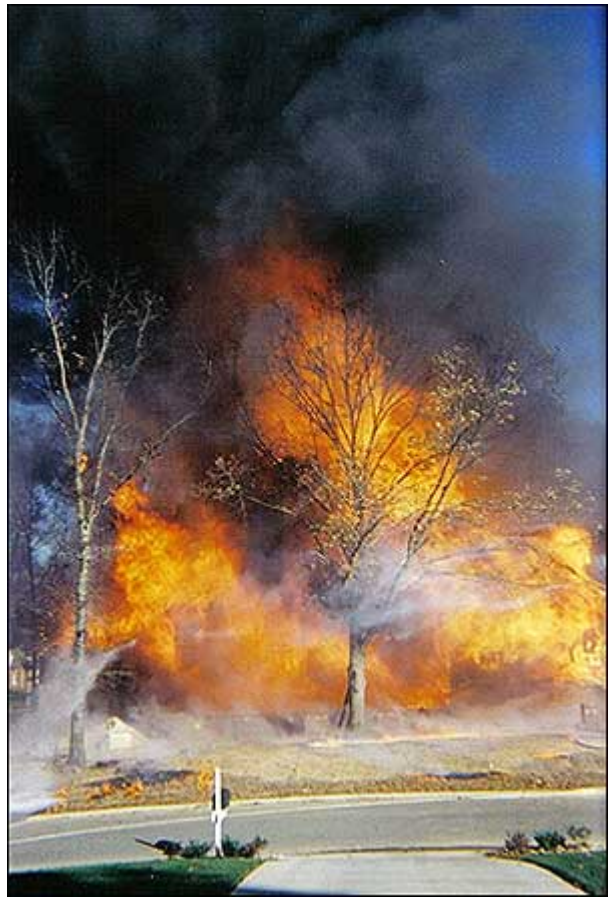
- Flammable Range
  - -The concentration of a substance in air between the LEL & UEL
  - -In this range, substances will readily ignite

Hydrogen	LEL = 4%	UEL = 75%
Gasoline	LEL = 1.4%	UEL = 7.6%
Methanol (Heet)	LEL = 6%	UEL = 36%
Ethyl Ether	LEL = 1.9%	UEL = 36%

Hazardous Constituents – Ignitability

Ignitable Liquids:

- Acetone
- Camp Fuel
- Isopropyl Alcohol
- Ethyl Ether
- Methyl Alcohol
- Paint Thinner



Vapor Pressure (VP)

- A measurement of a liquid's ability to evaporate as compared to water.
- Measured in mm Hg (millimeters of mercury)

  Water = 24 mm Hg
- Liquids with a high VP are more volatile and will produce higher concentrations of vapor.

Vapor Pressure

Examples of VP at 20º C (68º F)

Chemical:	Vapor Pressure:
Toluene	22 mm Hg
Methyl Alcohol	90 mm Hg
Acetone	220 mm Hg
Ethyl Ether	442 mm Hg

Vapor Density

- The ratio of the density of a gas to the density of an equal volume of air.
- Air has a vapor density of 1
- Gases with a vapor density of greater than 1 will sink and collect in low places.
- May present a toxic or explosion hazard (solvent or acid vapors).

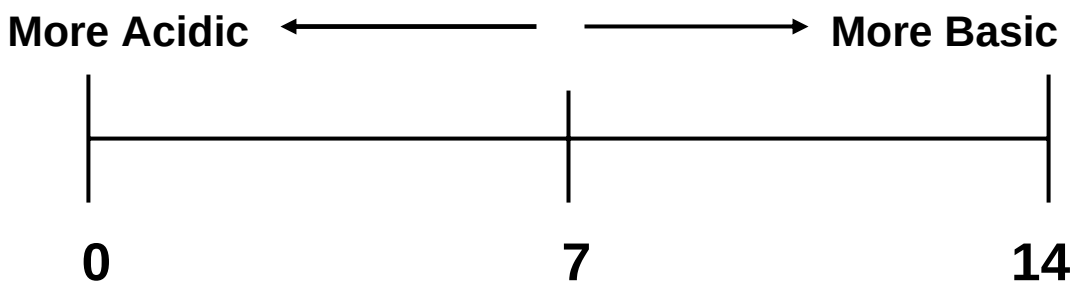
Molecular Weight

- Alternate method to determine if vapors are heavier or lighter than air.
- Air has a molecular weight of about 29.
- Vapors with a molecular weight of greater than 29 will sink.
- Vapors with a molecular weight of less than 29 will rise.
- **Used by NIOSH Pocket Guide to Hazardous Chemicals**

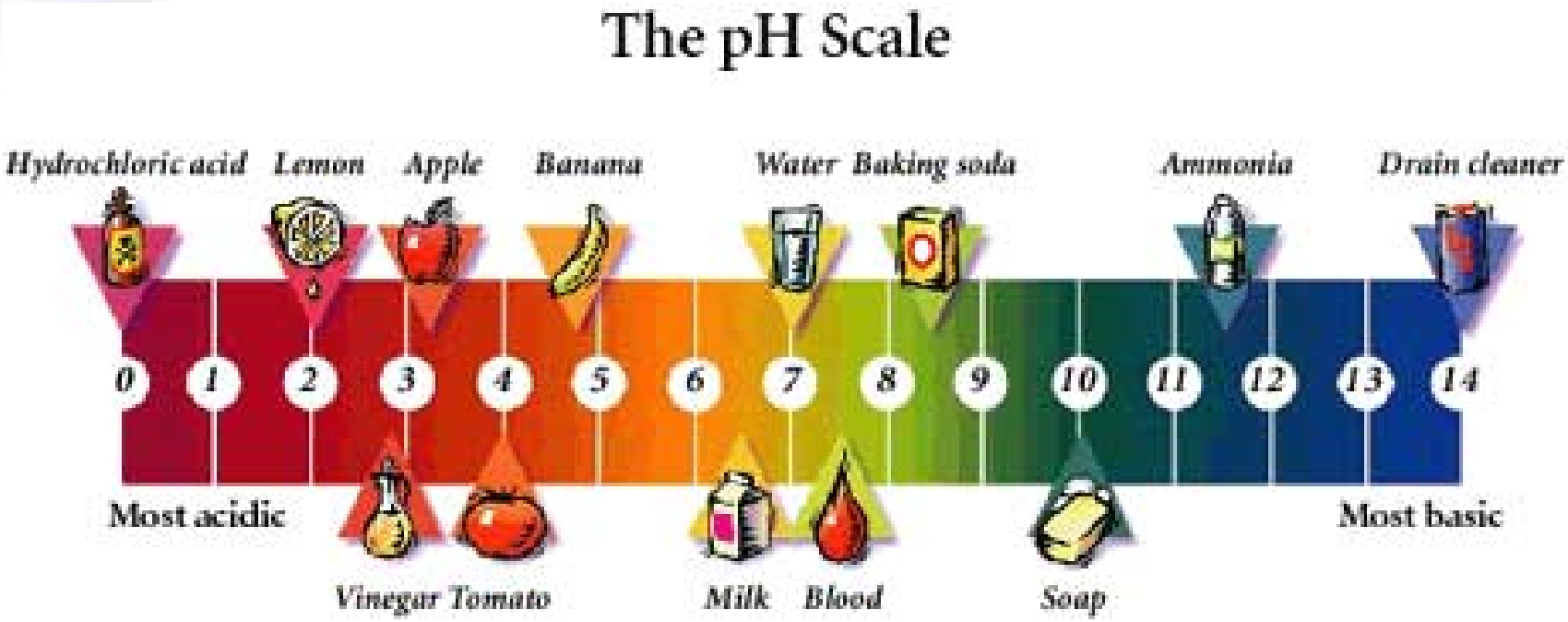
Hazardous Constituents - Corrosivity

Corrosive – pH below 2 or above 12.5

- All meth production methods use corrosives (Acids & Bases).
- pH is measured on a scale of 0 to 14.



Hazardous Constituents - Corrosives



Hazardous Constituents - Corrosives

Contact with skin causes severe irritation and burns.

Hazardous Constituents - Corrosives

- May react with metals to generate hydrogen gas which can create an explosion hazard
- Can create heat (exothermic reaction) and support combustion when mixed with water or when an acid and base are mixed.
- Acid gas generators-produce HCL gas which produces irritation and corrosive burns to the respiratory tract.

Hazardous Constituents - Corrosivity

Example: Sulfuric Acid (Battery Acid)

- Used in acid-gas generators with rock salt to produce HCL gas.
- Extremely corrosive to skin.
- Exothermic reaction with water (produces heat) and produces irritating mist.
- May cause fire on contact with organics/combustible materials.

Hazardous Constituents - Corrosivity

Corrosive Substances:

- Hydrochloric Acid
- Hydrogen Chloride
- Hydriodic Acid (liquid)
- Hydrogen Iodide (gas)
- Iodine
- Sulfuric Acid
- Sodium Hydroxide

Hazardous Constituents – Reactivity

Reactants:

- Unstable chemicals that may react violently if mixed with other chemicals, even water or air.
- May spontaneously ignite, produce heat, or toxic vapors.
- Usually highly exothermic – produces heat.
- Capable of detonation or explosion

Hazardous Constituents – Reactivity

Reactant Substances:

- Lithium – *Water reactive*
- Sodium – *Water reactive*
- Red Phosphorous – Reacts w/hydriodic acid to produce phosphine gas, which can explode on contact with air.
- Iodine – *Lithium, Sodium, bleach, ammonia*
- Ethyl Ether - *forms peroxide crystals, when stored for long periods or exposed to sunlight.*

Ammonia Nitrate – *Bad Idea*

Some meth cooks have attempted to manufacture their version of anhydrous ammonia by heating ammonium nitrate in order to convert it into anhydrous ammonia.

Ammonium Nitrate Explosion

Hazardous Constituents – Toxicity

Toxicity is dependent upon:

- Chemical Structure
- Route of Exposure
- Dose
- Duration or Length of Exposure
- The body's ability to detoxify the substance and eliminate it from the body.
- The extent to which the substance is absorbed by the body.

Hazardous Constituents – Toxicity

Acute Exposure/Effect: The ability of a substance to produce injury after a single short-term exposure.

- Short Duration
- High Concentration

Most likely to occur during meth lab assessments (example – solvent/acid fumes).

Hazardous Constituents – Toxicity

Chronic Exposure/Effect: The ability of a substance to produce injury after long-term continuing exposure or many repeated exposures.

- Long Duration
- Low Concentration

Hazardous Constituents – Toxicity

A toxic chemical may cause acute effects, chronic effects or both.

Example:

If you inhale solvents on the job, you may experience acute effects such as headaches and dizziness which go away at the end of the day. Over months, you may begin to develop chronic effects such as liver and kidney damage.

Hazardous Constituents – Toxicity

Routes of Exposure:

- Inhalation: Almost all chemicals found at meth labs. *Smell - not always a good indicator of exposure.*
  - *Example: Iodine-Only 10-50% of people can detect the TLV-C of 0.1 ppm.*
- Injection: *Sharps/Needles – HIV/AIDS*
- Absorption/Contact (skin or eyes): *Corrosives/Solvents*
- Ingestion

Hazardous Constituents – Toxicity

Four basic categories of toxic materials:

1) Irritants: Attack mucous membranes (respiratory system)
   - Examples include HCL, Sulfuric Acid, Ammonia, and Phosphine Gas
2) Anesthetics: Effects the central nervous system (depressant)
   - Examples include Acetone, Methanol, Benzene, and Ethyl Ether
3) Asphyxiants: Deprive the body of oxygen. Can be Simple or Chemical.
   - Example: Chemical - Hydrogen Cyanide Gas, CO

Hazardous Constituents – Toxicity

Four basic categories of toxic materials:

4) Systemic Poisons: Produce damage to body systems/organs
   - Classified according to their target organs.
   - May attack more than one organ or body system.
   - May act as carcinogens, mutagens, or teratogens

Benzene	**Formula:** C6H6	**CAS#:** 71-43-2	**RTECS#:** CY1400000	**IDLH:** Ca [500 ppm]
Conversion: 1 ppm = 3.19 mg/m3	**DOT:** 1114 130			

Synonyms/Trade Names: Benzol, Phenyl hydride

Exposure Limits:	**Measurement Methods (see Table 1):**
NIOSH REL: Ca **OSHA PEL:** [1910.1028] TWA 0.1 ppm TWA 1 ppm ST 1 ppm ST 5 ppm See Appendix A See Appendix F	**NIOSH** 1500, 1501, 3700, 3800 **OSHA** 12, 1005

Physical Description: Colorless to light-yellow liquid with an aromatic odor. [**Note:** A solid below 42°F.]

Chemical & Physical Properties:	**Personal Protection/Sanitation (see Table 2):**	**Respirator Recommendations (see Tables 3 and 4):**
MW: 78.1 **BP:** 176°F **Sol:** 0.07% **Fl.P:** 12°F **IP:** 9.24 eV **Sp.Gr:** 0.88 **VP:** 75 mmHg **FRZ:** 42°F **UEL:** 7.8% **LEL:** 1.2% Class IB Flammable Liquid	**Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contam **Remove:** When wet (flamm) **Change:** N.R. **Provide:** Eyewash Quick drench	**NIOSH** **¥:** ScbaF:Pd,Pp/SaF:Pd,Pp:AScba **Escape:** GmFOv/ScbaE **See Appendix E** (page 351)

Incompatibilities and Reactivities: Strong oxidizers, many fluorides & perchlorates, nitric acid

Exposure Routes, Symptoms, Target Organs (see Table 5):	**First Aid (see Table 6):**
ER: Inh, Abs, Ing, Con **SY:** Irrit eyes, skin, nose, resp sys; dizz; head, nau, staggered gait; anor, lass; derm; bone marrow depres; [carc] **TO:** Eyes, skin, resp sys, blood, CNS, bone marrow [leukemia]	**Eye:** Irr immed **Skin:** Soap wash immed **Breath:** Resp support **Swallow:** Medical attention immed

Environmental Concerns

Environmental Concerns

For each pound of meth manufactured,

5 – 7 lbs of hazardous waste is produced.

Environmental Concerns

Fate of hazardous waste –

- Poured down the drain or toilet.
- Stored somewhere in the dwelling.
- Dump in the yard or nearby.
- Discarded along roadsides and ravines.
- Dump into streams, rivers, and lakes.

Road Side Dump

Road Side Dump

Road Side Dump

Discarded Tank

Burial Pit

Meth Lab = Fish Kill

Dump site contaminates creek

Fish found dead in South Canal Creek near Highway 59

By MIKE DE LA CRUZ
Staff Writer

A Caltrans worker found what could be a methamphetamine lab dump site, said sheriff's Deputy Wayne Hutton.

The worker was sweeping the shoulder of Highway 59 north of Oakdale Road Wednesday shortly before noon when he noticed empty industrial-size cans and dead fish in South Canal Creek, where it intersects the highway, and immediately reported the incident.

Soon a Merced County Sheriff's Department deputy, the California Highway Patrol, and officials from the state Department of Forestry, county Health Department, and state Department of Fish and Game, responded.

Sheriff Tom Sawyer, on scene, said any hazardous materials are treated very seriously because of the unknown levels of toxicity. "So we always have a full-blown response until we analyze the contents," he said.

Sheriff's Deputy Wayne Hutton, investigating the incident, said 12 empty 5-gallon alcohol cans, 57 empty 1-gallon alcohol cans, and 10 gray 5-gallon cans without labels, were found. Alcohol is one of the ingredients in methamphetamine, also known as crank, the deputy said.

The cans were crushed and empty and had been transported to the creek in black trash bags, Hutton said. What was originally thought to be a major hazardous spill was downgraded when the cans were found to be empty and crushed.

It is now believed the cans could come from a minor dump site for chemical containers from an illegal methamphetamine laboratory, Hutton said. Hutton said numerous large dead fish were found floating in the slow-moving creek near the dumped cans.

"However, fish farther up the creek on either side were alive and swimming," Hutton said.

But the water will be tested to determine if it is safe for the cattle grazing on both sides of the highway.

The land on the west side of the highway is owned and the land on the opposite side is leased by the Bert Crane Ranch.

Manufacturing Methods

Manufacturing Methods

- Two basic methods of meth manufacturing
  - Anhydrous Ammonia or “Nazi” Method
  - Red Phosphorous + Iodine (Red PI) Method
- Same process except for the “cook” or “reaction” phase
  - Nazi – Anhydrous ammonia + lithium or sodium
  - Red PI – Hydriodic acid + red phosphorous
- Both utilize solvents, corrosives and highly reactive chemicals

Manufacturing Methods

- Solvents – used for the extraction of psuedoephedrine from cold tablets and for extraction of the finished meth product.
- During the extraction phase, a hotplate is sometimes used to evaporate off the residual solvents
  - This poses a significant fire/explosion hazard due to the high volatility of the solvents!!!

Manufacturing Methods

- Corrosives are used in a number of different manufacturing steps
- Red PI Method - Hydriodic acid is used with Red Phosphorous in the “cooking” phase
  - **Produces deadly Phosphine Gas**
- Sodium Hydroxide, Sulfuric Acid, and Hydrochloric Acid are all used during the “cleaning” phase.

Death Bags

Manufacturing Methods

Acid-Gas Generators

Hydrochloric Acid (HCL) Gas is bubbled through a meth base, causing meth crystals to form.

Manufacturing Methods

No HCL Gas?
Use rock salt +
Sulfuric Acid or
aluminum foil +
Muriatic Acid

HCL Gas is highly corrosive and causes severe burns on skin and causes burning and irritation of the respiratory system!!!

Manufacturing Methods

- **Reactive substances – Nazi Method**

Lithium is a flammable solid. Reacts violently with water to form caustic lithium hydroxide and hydrogen gas (LEL = 4%, UEL = 75%)

Sodium reacts violently with water (including moisture in the air) to produce caustic sodium hydroxide and hydrogen gas. Reacts explosively with sulfuric acid

Suspect Lab Found In Car

Four Sallisaw Men Arrested

By Monica Keen
Staff Writer

Four men are facing various drug charges after Sallisaw police uncovered the makings of an alleged methamphetamine lab in their vehicle.

John William Ayre, Darrell Dewayne Barger, Robert Gene Barger, and Danny Ray Tubbs, all of Sallisaw, were arrested and booked into the Sallisaw City Jail June 13 on charges of manufacturing or attempting to manufacture a controlled dangerous substance and possession of precursor.

According to a police report, the arrests stemmed from a traffic stop in which the driver, Darrell Dewayne Barger, 47, was stopped traveling 52 miles per hour in a 40-mile-per-hour zone at Kerr Boulevard and Carson Road in Sallisaw.

The officer reported that the three passengers in Barger's vehicle, including his brother Robert Barger, Tubbs, and Ayre, seemed nervous. An identification check showed that Robert Barger had an outstanding warrant for his arrest.

After Robert Barger was arrested on the warrant and Darrell Barger was issued a verbal warning for speeding and a citation for no insurance, the driver asked how much it would cost to get his brother out of jail. While speaking with Barger, the officer noticed a strong chemical odor coming from inside the vehicle, consistent with the manufacture of methamphetamine.

The officer received consent to search the vehicle. As the officer began to look inside the vehicle, Tubbs admitted that there was "some stuff" in the vehicle.

A search of the car uncovered several boxes of matches, a glass jar containing a purple liquid with a gray crystal substance, a bottle of Muratic acid, and various other items commonly used in the manufacture of methamphetamine. Police also found three receipts dated on the same day of the stop, which showed that Heet, tubing, Brakleen, and another item were purchased.

Environmental Sampling

Things to Consider

- What type of method was used to illegally manufacture the meth.
- How long did the cooking operation take place.
- Where did the cooking take place.
- Where is the ventilation system in proximity to the cooking operation.

Sampling may vary depending on –

- Information gathered during the preliminary investigation.
- The chemicals and methods employed during the cook.
- The visual extent and severity of contamination.
- The best judgment of the professional conducting the assessment.

Sampling Equipment

Photoionization Detector

- **Measures VOCs (Volatile Organic Compounds) and some inorganics.**
- **Common chemicals found at meth labs that a PID can detect:**

- Toluene
- Benzene
- Phosphine
- Hexane
- Ether
- Charcoal lighter fluid
- Paint thinner
- Naphtha
- Iodine vapors
- Acetone
- Diethyl Ether
- Gasoline
- Isopropyl Alcohol

Photoionization Detector

Application – Meth Labs

- Initial Entry – make sure atmosphere is safe.
- Testing confined spaces – basements, closets, etc., where VOCs may accumulate.
- Test for presence of VOCs in drains, toilets, and septic systems.
- Test “suspicious” containers.

Photoionization Detector

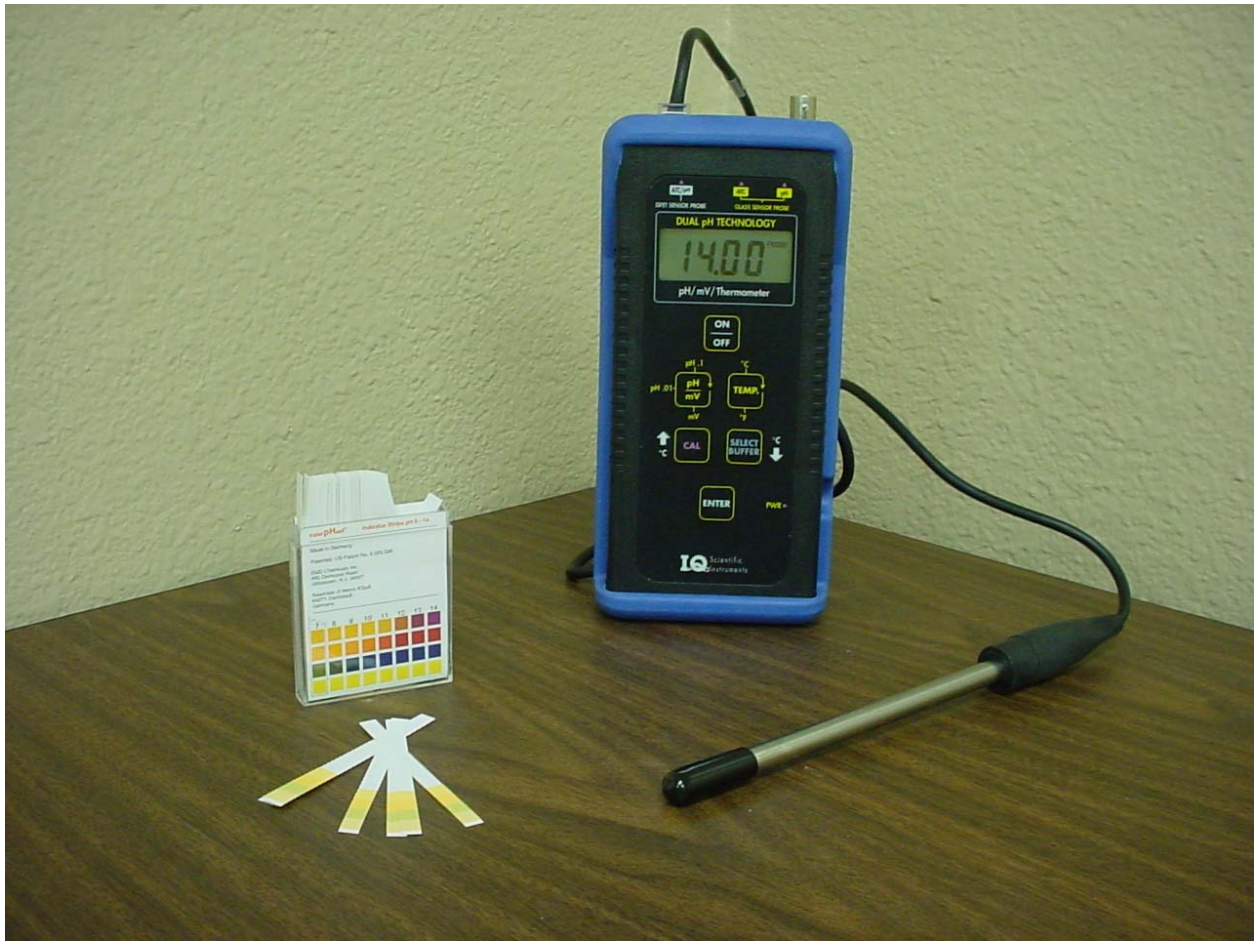
Sludge Judge

Application – Meth Labs

- Used for sampling septic systems.
- Collection of VOCs that may have been poured down drain & into septic system.

The Starch Test

pH Meter or Paper



Sampling Activities

Assessment Activities

Activities:

- Preliminary Assessment (Initial Site Assessment)
- Sampling Event
- Findings/Recommendation Report
- Post Decontamination Sampling (Clearance Test)

Preliminary Assessment

Prior to site visit:

- Collect all pertinent information.
  - Police Reports
  - Site Location/Description
  - Municipal or Private Sewer System
  - State of the Utilities

Preliminary Assessment

Site Visit:

- Use the PID to identify areas of contamination (sinks, drains, containers).
- Take photographs of all pertinent items:
  - Exterior of the Structure
  - Sampling Locations
  - Stains, burns, etched or pitted areas
  - Any suspicious items

Types of Samples

- **Discrete** – are individualized and specific. They represent one distinctive sample location.
- **Composite** – consists of multiple sample locations. Composite samples reflect an average contamination level. They should be collected in areas where the contamination is perceived to be equally distributed.

Discrete vs. Composite

- **Discrete:** High-level contaminant areas, such as “cooking” areas, chemical storage areas, and waste disposal areas.
- **Composite:** Adjacent areas, such as bedrooms, common areas, and unattached structures.

Sample Considerations

Areas that are considered high hand contact areas can produce a ***false positive result*** for composite sampling.

- Light switches
- Door Knobs
- Faucets
- Thermostat Controls

Sampling Plan

Plan should include:

- Diagram of structure with sampling points identified.
- Method of sample collection (discrete or composite).
- Identify media type (water, soil, wipe, or sludge).
- Describe what analyses are to be performed on each sample (VOC, Meth, etc).

Sample Media Collection

Sampling Team

- 3 member sampling team:
  - Sample Collector (collects samples)
  - Record Keeper (records sample collection & carries all supplies)
  - Safety/Health Officer (remains outside of the structure)
- Sample Collector or Record Keeper should maintain radio contact with S/H Officer through out the sampling event.

Sample Media

- Interior Surfaces
- Soil
- Water
- Sludge

Interior Surfaces/Wipe Samples

Supplies:

- Sample media consists of a 90mm diameter filter paper (Whatman 40) or equivalent.

- Sample container consists of laboratory 4 – ounce glass containers with Teflon-lined lids.

Wipe Samples

Supplies:

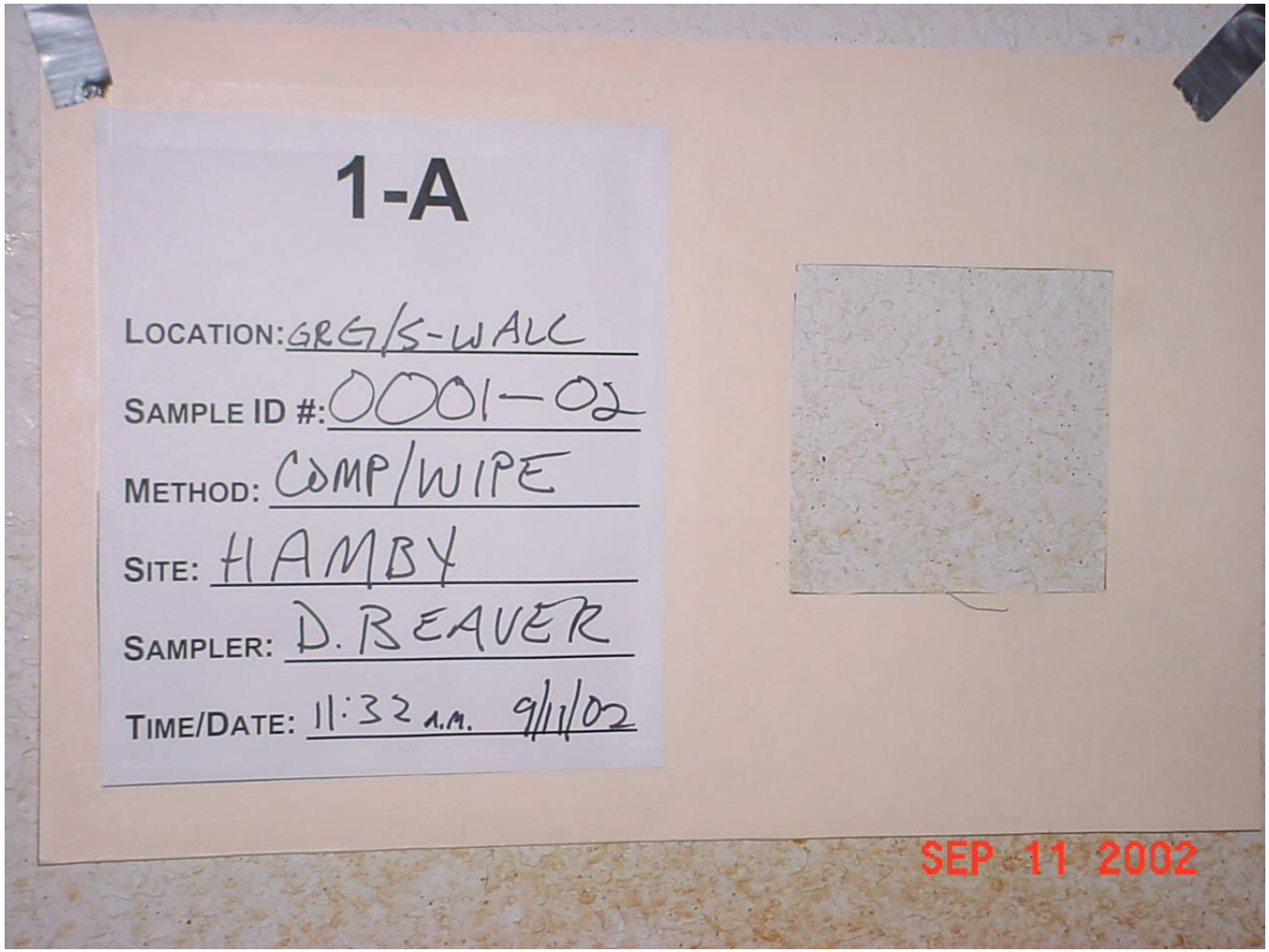
- Analytical Grade Methanol is used as the extraction solvent for collecting methamphetamine residue.

Sample Preparation

Offsite:

- **Composite Samples:** Using gloves place 4 filter papers into labeled (sample Id#) plastic freezer bag and saturate with Methanol.
- **Discrete samples**: Use one filter paper/bag.
- Place all equipment in secured storage containers for transport to site.

Wipe Sample Template



Wipe Sample Template

- Templates should be thin (<3mm) and rigid enough to hold their shape.
- Sample area is 100 cm^2 (10 cm X 10 cm) for single (discrete) samples.
- Composite samples consist of four 100 cm^2 (10 cm X 10 cm) areas
  - Total area sampled = 400 cm^2

Discrete Wipe Sampling Procedure

- **First Wipe:** Fold the wipe into quarter sections.
- Use an overlapping “Z” pattern.
- **Second Wipe:** With a clean quarter section, wipe using an overlapping “N” pattern.
- Avoid wiping the template.
- Sampler inserts the filter paper into sample container, record keeper secures lid (only one sample per container).
- Repeat procedure for each sampling location, using new gloves.

Splash Plate

Composite Wipe Sampling Procedure

- Collection of multiple samples taken from different locations.
- Samples are taken from similar surfaces.
- Collected where contamination is expected to be relatively evenly dispersed.
- Samples are combined and analyzed as a single sample.
- Sample area is four 100 cm^2 (10 cm X 10 cm)
  - **Total sample area is 400 cm^2**

Composite Wipe Sampling Procedure

- Before sampling, place 4 filter papers in freezer bags and saturate with Methanol.
- A separate filter paper is used for each sub-sample location.
- Each composite sample will include four filter papers.

Composite Wipe Sampling Procedure

- Sampling procedure is the same as discrete sampling except:
  - The same pair of gloves may be used to collect the sub-samples that comprise the composite sample.
    - * *But each new composite sample will require use of new gloves*
  - Use the same side of the filter paper to horizontally and vertically wipe the surface.
  - All four sub-samples are placed into a single sample collection container.

Soil Sampling

Soil Sampling

Where to sample:

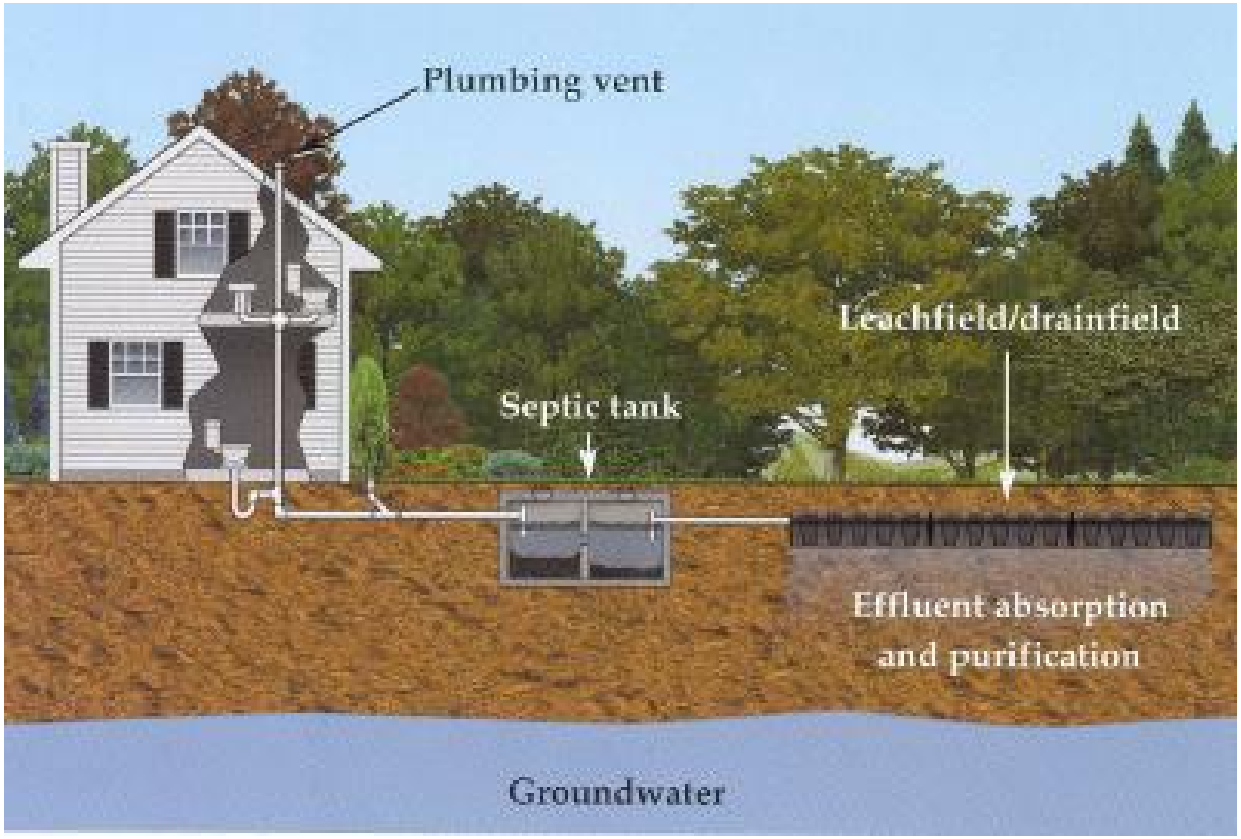
- Stained Soil
- Distressed Vegetation
- Burn Pile
- Leachfield/Drainfield

Used to determine if VOC's are present

Stained Soil

Burn Pile

Leachfield/Drainfield



Soil Sample Protocol

Samples should be collected according to EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.*

Soil Sampling - Equipment

Jar Collection Method

- Stainless Steel Hand Spade/bowl
- 4 ounce jar

Soil Sampling – Jar Collection

- Collect samples from a freshly exposed surface by scraping away debris or other objects (i.e. leaves, grass, sticks, etc.).
- Collect and transfer the sample as quickly as possible and with minimum disturbance.
- Fill **two** 4 oz. container until there is no headspace left. Pack the soil if needed.
- Record the depth at which the sample was collected. The depth should not exceed six inches.

Water Sampling

Water Sampling

- Test for VOCs and semi-volatile organic compounds.
- Determination to test will be based on the preliminary assessment, police reports, proximity of water body to meth lab, visual observation and other pertinent information.

Water Sampling

Wastewater Sampling

Wastewater Sampling

- Test for presence of VOCs.
- Use Sludge Judge to collect samples
- Determine whether wastewater samples need to be collected.
  - * Based on Police reports, property owner, PID readings & other information
- Prior to sampling, the septic tank must have been sufficiently excavated to indicate whether the tank consists of one or two chambers.

Findings/Recommendation Report

Report contains:

- Site description, photographs, and map.
- Reason for performing the work.
- Findings from the Preliminary Assessment.
- Sample methodology.
- Explanation of the lab analysis of samples.
- Diagram of sample results.
- Decontamination recommendations.
- Recommendation for Post Decon Sampling.

Decontamination Program

Measurement of Success:

- Sampling for methamphetamine levels is 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***.

Cleanup Levels

State	Cleanup Limits	Conversion (ug/100cm^2)
Oregon	0.5 ug/ft^2	0.05
Washington	0.1 ug/100cm^2	0.1
Colorado	0.5 ug/100cm^2	0.5
Arkansas	0.5 ug/ft^2	0.05
Tennessee	0.1 ug/100cm^2	0.1
Arizona	0.1 ug/100cm^2	0.1
Alaska	0.1 ug/100cm^2	0.1
Minnesota	< 1.0 ug/ft^2	< 0.1
Montana	0.1 ug/100cm^2	0.1

Post Decontamination Sampling

- Target the “hot” areas.
- Re-examine the decontamination plan.
- Fewer number of samples are taken.
- Composite sampling is utilized more than discrete.
- If all areas are determined to be below the action level, then reoccupation is granted.

Thank You!

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Environmental Programs

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