Local Health Department Action Plan for the Decontamination of Methamphetamine Labs in Ohio

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ABSTRACT

This paper contains an action plan for the decontamination of methamphetamine labs. By looking at the literature on methamphetamine labs and action plans created by other states, I formed a plan for Ohio. The plan explains what to do when it comes to airing out the location, removing contaminated items, washing items, plumbing, water in the well or on the property and surrounding land. In order to understand the need for an action plan the paper explains the dangers that are associated with the methods of producing methamphetamine, the chemicals involved and how it can damage the environment and human health.

IMPLICATIONS

The information in this paper provides Ohio with an action plan that will guide local counties when they are faced with having to decontaminate a methamphetamine lab. This is important because methamphetamine labs are a fairly new problem and not all counties are aware of what needs to be done. The action plan will guide the counties in the proper ways of decontamination and help to return the location into what it was originally used for before it was contaminated.

INTRODUCTION

Over the past few years Ohio has experienced an alarming increase in the amount of methamphetamine labs that are being seized by law enforcement officials. These labs are causing major concern when it comes to the health of the environment and the human beings that may come into contact with the lab or have already been in contact with it. Producing methamphetamine requires numerous chemicals that are mixed and altered in order to achieve the final product.

Currently, no statewide action plan exists that deals with labs that have been abandoned without removing the hazardous wastes. Health departments in Missouri, Washington, Oregon, Colorado and a few other states have started to form their own plans, but they are not all uniform. For the time being these plans have worked for these states, but what about all the other states? An action plan that is uniform, current and accurate would bring all states onto the same level. This would allow for decontamination of a methamphetamine lab to be an organized and efficient task.

DISTRIBUTION AND AVAILABLITY

Distribution and availability of methamphetamine has grown drastically for a few reasons. One of the main reasons for this growth is the alarming increase in the amount of labs located in Ohio. The amount of labs has increased greatly from the 36 laboratories found in 2000, to 96 in 2001, to 114 in 2002 and 108 in the first part of 2003[1]. These labs can be located in numerous places. Currently, the most popular location for a methamphetamine lab is a motel room[2]. The reason for this is that the person can pay for the room in cash, produce the methamphetamine and leave the area before the motel figures out what is going on. Other locations of labs have been rental storage units, residential property, barns, sheds, rural property and automobiles[2]. The extent of locations allows for just about anyone to have access to methamphetamine.

Another reason for this drastic growth is because of the numerous ways that methamphetamine can be used. It can be snorted, smoked, injected or taken as a pill form, allowing for many drug users to experiment with it[3]. Users that tend to be a little more conservative may choose the pill form or smoking. Hard core drug users that have experimented with numerous types of drugs may choose the snorting or injecting.

The last reason for the wide distribution and availability of methamphetamine is it is cheap to make and all the materials are easily bought. An investment of $3,000 in materials can yield $35, 000[2]. Material can be found at numerous different stores across Ohio. Stores like Wal-Mart or K-Mart can provide the necessary materials. These materials may include cans, aluminum foil, duct tape, gloves, blenders, etc[4]. Each method requires different material.

METHODS OF PRODUCTION

Another big concern for counties with labs is the methods used to produce methamphetamine. Each method is fairly simple to learn and readily available to anyone. This means that anybody, even people with no experience in producing drugs, could obtain the recipe for methamphetamine and produce it. The recipes can be found on the Internet, in books or from other methamphetamine producers[5]. The two most common methods that are being used in Ohio are the Red Phosphorus method and the Nazi method[2]. Both of the methods are highly dangerous because the cook, the person making the methamphetamine, is dealing with mixing

highly poisonous chemicals or heating chemicals that produce acid vapors[5]. The production of one kilogram of methamphetamine will generate seven kilograms of waste[6]. These vapors and chemicals can get into bodies of water, wells, the air and the ground where they could possibly harm other people.

Red Phosphorus Method

The Red Phosphorus method is also called "Red P," HI" method or the Red, White and Blue method. The main chemicals that are commonly associated with the use of this method are; hydriodic acid, hydrochloric acid, sodium hydroxide, sodium chloride, red phosphorus, iodine, isopropyl alcohol, ethyl alcohol, methyl alcohol, hydrogen peroxide, naphtha, charcoal lighter fluid, acetone, benzene, toluene, ethyl ether, Freon, hydrogen chloride gas and chloroform. The wastes that are generated from this process include flammable sludge, phosphine gas, hydriodic hydrogen chloride gas, phosphoric acid and yellow or white phosphorus[7].

Nazi Method

The Nazi method is also called the "Ammonia" or "Birch" method. Chemicals that are used in production are; anhydrous ammonia, lithium metal, sodium metal, isopropyl alcohol, ethyl alcohol, methyl alcohol, hydrogen chloride gas, hydrochloric acid, sulfuric acid, sodium chloride, toluene, naphtha, Freon, ethyl ether, chloroform and methyl-ethyl-ketone. Wastes generated are flammable sludge and hydrogen chloride gas[7].

ACUTE AND CHRONIC HEALTH EFFECTS OF CHEMICALS INVOLVED IN PRODUCTION

Each hazardous chemical that is involved in the production of methamphetamine has the potential to cause severe harm to a human being. It is very hard for doctors and toxicologists to determine what will happen to a human when they are exposed to one of these chemicals. Toxicologists are not given the option to test humans since human testing is regarded as highly unethical. Therefore, toxicologists have to rely on other information to determine the possible acute health effects (see Table 1). The other information could be from animal testing, looking at other chemicals with similar properties or studying people that have been exposed involuntarily.

Table 1. Acute and Chronic Health Effects of Chemicals Involved in Production[8,9,10]

Chemical Name	Acute and Chronic Health Effects
Acetone	**(A)** Nose, throat, lung and eye irritation. Lightheadedness, confusion, increases pulse rate, nausea, vomiting, unconsciousness and possibly coma. **(C)** Kidney, liver and nerve damage, increased birth defects and lowered reproduction ability occurred in animals, but it is not known if this will happen to humans.
Anhydrous ammonia	**(A)** Severe burns to skin, eyes, throat and lungs. Coughing, nose and throat irritation, blindness, lung damage and death. **(C)** Chronic irritation of the respiratory tract and eyes, chronic cough, asthma and lung fibrosis.
Benzene	**(A)** Drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, unconsciousness, vomiting, sleepiness, convulsions, excessive bleeding and death. **(C)** Anemia, alterations to immune system and leukemia.
Chloroform	**(A)** Dizziness, fatigue, headaches, damage to liver and kidneys, birth defects and sores on the skin if contact occurs. **(C)** Possible carcinogen.
Ethyl alcohol	**(A)** Irritate eyes, nose and skin. Headaches, drowsiness, weakness, exhaustion, cough, liver damage, narcosis and anemia. **(C)** No information found.
Ethyl ether	**(A)** Dizziness, drowsiness, headaches, excited, narcosis, nausea, vomiting, eye, upper respiratory and skin irritation. **(C)** Nervous system damage.
Freon	**(A)** Dyspnea (breathing difficulty), dizziness, incoordination, narcosis, nausea, vomiting, heart palpitations, frostbite and dermatitis. **(C)** No information found.
Hydriodic acid	**(A)** Irritation of skin, eyes and throat. Labored breathing, shortness of breath, burns and blisters of skin and frostbite when contact occurs.

	(C) Digestive disorders.
Hydrochloric acid	**(A)** Corrosive to skin, eyes, nose, mucous membrane and gastrointestinal tract. Severe injury to throat, mouth, esophagus and stomach. Shock, circulatory collapse and respiratory depression.
	(C) Gastritis, chronic bronchitis, dermatitis and photosensitization. Discoloration and erosion of teeth.
Hydrogen chloride gas	**(A)** Throat irritation, rapid breathing, narrowing of the bronchioles, blue coloring of the skin, accumulation of fluid in the lungs and death. Suffocation, swelling and spasms of throat. Eye and skin irritation, discoloration of teeth.
	(C) Changes in pulmonary function, chronic inflammation of bronchi, nasal ulceration and symptoms resembling acute viral infection of upper respiratory tract as well as inflammation of the skin, discoloration and erosion of dental enamel and inflammation of the eye.
Hydrogen peroxide	**(A)** Respiratory, ocular and pulmonary irritation. Vomiting, mild gastrointestinal irritation, gastric distension, embolism, loss of consciousness, respiratory paralysis, bleaching or burning of the skin if there is contact.
	(C) Repeated exposure to vapor may cause chronic irritation of respiratory tract and partial or complete lung collapse. May also bleach skin or hair.
Iodine	**(A)** Damage to thyroid gland resulting in damage to skin, lung and reproductive organs.
	(C) Possible increased risk of thyroid cancer.
Isopropyl alcohol	**(A)** Mild eye, nose and throat irritation. Drowsiness, dizziness, headaches, and dry cracking skin.
	(C) Carcinogen, dermatitis, conjunctivitis, reduced memory and concentration and loss of personality.
Methyl alcohol	**(A)** Eye irritation, headaches, drowsiness, lightheadedness, nausea, vomiting, visual disturbance and blindness.
	(C) Respiratory impairment, bronchitis, defatting of skin and conjunctivitis.

Methyl-ethyl-ketone	**(A)** Irritation to eyes, nose, throat and skin. **(C)** No information found.
Naphtha	**(A)** Lightheadedness, drowsiness, eye, nose, skin irritation, dermatitis. **(C)** Kidney and liver damage.
Phosphine gas	**(A)** Pain in the diaphragm, nausea, vomiting, excitement and phosphorus smelling breath. Weakness, bronchitis, pulmonary edema, shortness of breath, convulsions and death. Visual, speech and motor problems. **(C)** Inflammation of nasal cavity and throat, liver effects and increased bone density.
Phosphorus	**(A)** Coughing and irritation of the throat and lungs. Poor wound healing of mouth and breakdown of jawbone. Liver, heart or kidney damage, vomiting, stomach cramps, drowsiness or death. **(C)** Liver, heart or kidney damage
Phosphoric acid	**(A)** Irritation to eyes, skin and upper respiratory tract. Burns eyes and skin. **(C)** Corrosive action on human tissue.
Sodium chloride (salt)	**(A)** None. **(C)** None.
Sodium hydroxide	**(A)** Irritation of nose, throat and respiratory airways. Swelling or spasm of upper airway, inflammation of lungs and accumulation of fluid. Corrosive injury to mouth, throat, esophagus and stomach. Perforation, narrowing and hemorrhage of gastrointestinal tract. Severe burns and deep ulcerations in skin if contact. Burning and blindness in eyes. Can cause death. **(C)** No information found.
Sulfuric acid	**(A)** Burn skin if contact, tooth erosion and respiratory tract irritation.

	(C) Increase in cancers of the larynx.
Toluene	**(A)** Tiredness, confusion, nausea, weakness, memory loss, loss of appetite and hearing or vision loss. Unconsciousness, coma and death. Damage to kidneys. **(C)** Kidney damage.

PREDICTED ENVIRONMENTAL FATE OF CHEMICALS INVOLVED IN PRODUCTION

The environmental fate of the chemicals used in the production of methamphetamine is hard to determine. Each chemical will breakdown, leach, combine or build up in a different way. By determining the fate of the chemicals, it is easier to determine how a person could be exposed to the chemical (see Table 2). For example, if a chemical cannot leach through the soil to the groundwater then a human is not likely to be exposed by drinking groundwater.

Table 2. Predicted Environmental Fate of Chemicals Involved in Production[10,11]

Chemical Name	Environmental Fate
Acetone	Air- breaks down from sunlight or other chemicals in about 22 days Water- broken down by microorganisms in less than a day Soil- broken down by microorganisms, does not bind or build up Plants/animals- does not bind and fish do not store it in their bodies
Anhydrous ammonia	Air- removed by rain or snow Water- changed to nitrate or nitrite Soil- taken up by plants Plants/bacteria- serves as a nutrient
Benzene	Air- reacts with other chemicals and breaks down in days Water- can attach to rain or snow and make it to the ground Soil- passes through soil to groundwater Plants/animals- does not build up in plants/animals
Chloroform	Air- evaporates easily into air and breaks down slowly Water- dissolves easily and may breakdown to other chemicals Soil- passes from soil to groundwater where it stays for a long time Plants/animals- does not appear to build up
Ethyl alcohol	Air- rapidly breaks down Water- biodegrades in groundwater and surface water Soil- biodegrades

Ethyl ether	No information found
Freon	Air- moves quickly into air and is very stable (lifetime of 30-100 years). Will break down to form chemicals that can destroy ozone in the upper atmosphere Water- evaporates from surface water, but remains in groundwater Soil- only a small amount sticks to soil the rest moves to surface or groundwater. Can also break down or be transformed Plants/animals- does not build up in animals
Hydriodic acid	No information found
Hydrochloric acid	Air- removed by rainfall Water- lowers pH Soil- will evaporate from dry soil or mix with water in wet soil and go to groundwater Plants/animals- does not accumulate in food chain
Hydrogen chloride gas	Air- will be removed by rainfall
Hydrogen peroxide	Air- reacts rapidly with other compounds Water- breaks down rapidly Soil- breaks down by reacting with other compounds Plants/animals- does not accumulate in food chain
Iodine	Air- combines with water particles and goes to the ground Water- stays in surface water Soil- remains for a long time Plants- taken up by some plants
Isopropyl alcohol	No information found
Methyl alcohol	Air- exists in vapor phase with half-life of 17 days. Reacts with hydroxyl forming formaldehyde and with nitrogen dioxide forming methyl nitrite Water- removed by biodegradation Soil- removed by biodegradation Plants/animals- no bioaccumulation in aquatic organisms
Methyl-ethyl-ketone	Air- half will break down from sunlight in 1 day or less Water- dissolves and is broken down in about 2 weeks Soil- it does not stick to soil and will travel through the soil to the groundwater. It does not deposit in the bottom of rivers or lakes Plants/animals- it is not expected to concentrate in fish or increase in the tissues of animals further up the food chain
Naphtha	No information found

Phosphine gas	Air- half removed in one day by reacting with substances in air. In high concentrations some may spontaneously combust.
Phosphorus	Air- reacts with oxygen to form less harmful chemicals in minutes Water- reacts with oxygen within hours or days or may degrade to a highly toxic compound called phosphine, which will evaporate into the air and become less harmful Soil- may stick changed to less harmful chemicals within days or in deep soil can remain unchanged for years Plants/animals- can build up slightly in the bodies of fish
Phosphoric acid	No information found
Sodium chloride (salt)	None
Sodium hydroxide	Air- breaks down by reacting with other chemicals Water- separates into sodium cations and hydroxide anions making the water less acidic Soil- separates like it did in water Plants/animals- does not accumulate in food chain
Sulfuric acid	Air- dissolves in the water in the air and can remain suspended for a long period of time. Contributes to acid rain.
Toluene	Air- combines with oxygen to form benzaldehyde and cresol, two very dangerous chemicals Water- broken down by microorganisms in surface water, but remains in groundwater due to lack of organisms Soil- broken down by microorganisms Plants/animals- can be taken up by shellfish, fish and aquatic life, but will not build up in them

PRE-ASSESSMENT OF METHAMPHETAMINE LABS

When a methamphetamine lab is seized the first responders tend to be the police to arrest any criminals associated with cooking or selling the drugs; firefighters to put out a fire if it occurs and any medical personnel, in case of injury[6]. The second responders will depend on the hazardous material plan created by the Local Emergency Planning Committee (LEPC). The LEPC consists of members from the community that are; elected state and local officials, law enforcement, emergency management, firefighting, first aid, health, local environmental, hospital, transportation and broadcast/print media[12]. In most cases, the second responder will be the local health department or the Environmental Protection Agency (EPA) because they are highly educated about the environment and hazardous material, but that may not always be the

case. The second responder and the officials responsible for the decontamination depends on the local county.

The pre-assessment of a methamphetamine lab should be conducted to determine what chemicals were involved in the manufacturing method and to remove any visible chemicals. According to W. Holton, personal protective equipment such as respirators and protective clothing must be worn if the lab is in a confined area where vapors may be in high concentration[4]. The reports taken by the police and samples of any material already removed from the lab may also help determine the chemicals used and maybe even the method of production. During the inspection, any item that were used to mix, cook or store chemicals must be removed[13]. Any chemicals that are in jars, blenders or other containers should also be removed. All of the chemicals and items removed should be taken to the proper facility to be stored or neutralized, depending on the type of chemical.

When all the chemicals are removed, the owner of the property or whoever is appointed the job by the decontamination plan should contact a contractor that will perform the rest of the steps required to restore the property to its original use, before the lab was created. The contractor will also complete an assessment of the lab to determine the cost of the decontamination and the extent of what needs to be done. During this assessment, an official from the EPA, health department or whoever was appointed in the plan should be present to assist the contractor if any chemicals are found that were missed.

DECONTAMINATION ACTION PLAN

Before the actual date that the lab is going to be decontaminated, samples of the air in the lab, solid surfaces, water in the well and septic tank, any outside bodies of water and the ground around the lab should be taken. The samples will help determine whether hazards exist in a certain area and they can be compared to samples taken in the end to determine of the decontamination was successful. Determining the method of production used to make the methamphetamine will help to know the appropriate sampling method to use. Sampling should be performed according to Occupational Health and Safety Administration (OSHA) standards[13]. A professional that has had extensive experience with sampling water, air, solid surfaces and soil should do the sampling[13]. The professional will be able to rule out any other possible causes of

contamination so that the contractor is aware of what exactly is contaminated and what needs to be done to decontaminate.

During the actual decontamination, performed by the contractor, a hazardous material management official should be present at all times in case the contractor finds chemicals that had been buried or hidden and were not removed yet. The contractor should also be provided with an action plan from the department that the LEPC chose to be responsible for the decontamination. The plan will explain what the contractor should do to decontaminate the lab correctly based on the location and extent of contamination. The plan for Ohio should include some of the elements that are addressed in the plans created for Wisconsin, Missouri and Kansas plus a few more elements that were overlooked by these states and may be necessary for decontaminating some labs.

Airing Out Location

The first step that should be taken is to air out the lab. This should be done a few days prior to the date of decontamination. This will allow the chemicals in the lab to escape into the atmosphere reducing contamination and preventing odors[13]. If the lab is located in a motel or location where airing out is not an option, and then a filtration system could be used. The system must catch enough of the vapors and fumes coming out of the lab to lower the level of concentration to below the OSHA standards. To promote the evaporating and dispersal of solvents that were spilled, windows and doors may be closed and the temperature inside increased to 90 Fahrenheit for a few days[13,14]. During this time, the property should be off limits to everyone to prevent inhalation exposure. When the airing out process is complete the entire filtration system must be disposed of in a proper manner to prevent contamination of a landfill or dumpster.

Removing Contaminated Items

During production, vapors are given off and will spread over all surfaces and will be absorbed by some materials. Therefore, the second step should be to remove and replace all visibly stained and contaminated items in order to prevent them from contaminating other items, such as glasses placed on a stained countertop. These items may include sinks, toilets, bathtubs, dishwashers, toys, etc[13,14]. Any materials like couches, clothing or carpeting that could absorb

vapors or collect dust and powder from the chemicals should be washed thoroughly and then rechecked for staining or odor[13,14]. If staining or an odor stills exist then the material should be disposed of properly by placing it in a landfill.

Washing

Some surfaces like wood floors, counters, walls and tile can also absorb materials from the methamphetamine cooking[14]. If these surfaces are visibly stained and are determined to be beyond washing then the third step is to remove and replaced them. This may include removing all baseboards, banisters and floors. If the surface looks cleanable then it should be washed with a detergent, steam cleaned or dry-cleaned[13, 14, 15]. The washing should take place in a contained area where the water is not allowed to just run off into the street or down a drain. All water used for the cleaning should be tested and treated so that chemicals are not dumped into the drain. The walls should then be repainted to provide a barrier from any possible chemicals still left[13, 14, 15].

Plumbing

During the time that the lab was used some of the waste products may have been dumped down sinks, bathtubs or toilets. These wastes can then become trapped in drains or in the septic tank. The fourth step is determine what the extent of contamination could be for the plumbing system and then determines the best way to decontaminate it. A professional plumber could also be contacted[13, 14, 15]. The plumber must be warned of the chemicals that could be in the system so he/she can take the appropriate measures when pumping out the system. The local water treatment plant must also be warned because the plant may be contaminated[15]. The treatment plant will have their own emergency management response for decontamination.

If the lab is in an area where there is no city sewer then there is a septic tank and leach field that could be contaminated. If this is the case, the septic tank should be pumped and the health department will have to determine if the entire leach field needs to be removed and replaced[14, 15]. This can be done by sampling the earth around the leach field and the water running through the pipes in the leach field.

Water (well, pond, etc)

The well that is on the property should be analyzed and a decision must be made as to

what to do with the well. If there are chemicals found in the well then something must be done. Some chemicals may be very reactive so pouring chlorine or bleach into the well will not work. The best thing that can be done is to pump it, collapse it and either dig a new one or tap into the city water if it is available. Pumping the well will prevent any of the chemicals from leaching into any aquifer under the lab. For extra precaution samples can be taken from the aquifer to make sure there was no contamination.

Any surrounding bodies of water will have already had samples taken during the pre-assessment to be able to compare to the samples taken in the post assessment. If chemicals were found in the body of water it should be drained and left to fill naturally. When it refills the water must be tested again. If chemicals still exist in the water a water specialist should analyze the water and determine which chemicals remain and at what concentrations. If the concentrations are very low and the chemicals are determined to be at a low risk then the water can be left. If the concentrations are high and the chemicals are a risk then the water must be pumped out again and left to refill. Other measures may have to be taken if the concentrations are still too high after the second refilling. A sign should be posted near the water that was contaminated warning the general public to not use it for recreational purposes or eat any fish from it.

Surrounding Land

At certain areas surrounding the lab samples were taken during the pre-assessment and the areas were marked with something so that after the decontamination a sample could be taken in the same place for comparison. If the samples had concentrations of chemicals that exceeded the recommended level then the soil should be removed and taken to a location where it can be treated or disposed of properly. More soil should be brought in to cover up for any soil that had to be removed. If the soil has low enough concentrations then it should be left alone and signs should be posted to warn the public that the soil is contaminated and it should not be used for recreational purposes.

POST EVALUATION OF DECONTAMINATION

After the decontamination of the lab is complete, samples should be taken of the air in the lab, solid surfaces, water in the well and septic tank, any outside bodies of water and the ground around the lab. These samples will then be compared with the original samples taken before the

decontamination occurred. If any sample is found to have a concentration of chemicals that is still above a recommended amount then further decontamination will have to take place.

RECOMMENDATION FOR RESPONSE

Methamphetamine labs are never an expected occurrence in a county so when one is seized it takes a lot of time and planning to decontaminate it. A few major aspects that will help when it comes to performing a good response are organization, safety and education. All of these aspects will keep anyone involved stay safe and the environment will be restored.

Safety is the most important aspect to address when dealing with a methamphetamine lab. All people that will be in or around the lab must wear PPE at all times no matter what. All people that will be in contact with the lab must be protected. Things such as explosions, jars breaking, finding needles, finding chemicals, etc could pose a threat. If PPE is worn it will prevent a lot of harm and casualties.

Organization is a very important aspect for completing the decontamination of a lab in a timely manner. The decontamination should be handle by one department, such as the local health department, EPA or whoever is appointed by the LEPC. The lead agency that is chosen to handle the decontamination should conduct all the sampling before and after the decontamination. A sampling professional could also be hired if the agency does not feel that they have the proper equipment or capabilities[12].

Education is also very important for decontaminating methamphetamine labs. It is important that everyone that will be in contact with the lab be very aware of the dangers that it poses. Police, firemen, health department, EPA, contractors, etc should be educated on the types of chemicals that will be found in the lab, the potential health effects the chemicals could cause and what do to if exposure does occur. Education will also help the officials understand why PPE and safety are so important.

CASE STUDY- CRITIQUE OF RESPONSE TO METHAMPHETMAINE LAB IN WOOD COUNTY

Response

The Wood County Health Department is located in Northwest Ohio. The Director of Environmental Health at the department is Brad Espen and he handles all chemical related

nuisances. On December 12, 2002 Brad Espen was alerted to the existence of a methamphetamine lab at 7143 Pemberville Road. The lab had been seized by the drug enforcement administration (DEA) in Wood County the night before. It was the health departments understanding that the DEA would find a contractor to decontaminate the lab since the owner was in jail. The health department still inspected the property and found numerous piles of starter fluid cans, debris and a hazardous waste notification on the door. On January 8, 2003 the health department reinspected the property and found that no progress had been made in getting the lab decontaminated.

On February 25, 2003 after meeting with the DEA, Sheriff's office and the Prosecutor it was decided that the health department would be the lead agency in the decontamination and Brad Espen would write up a protocol for it. The Prosecutor has the right to decide that the health department can take over the decontamination because he can provide any member of the LEPC advise and assistance[16]. The health department then reinspected the property, this time going into the actual location of the lab, the garage. More debris was found along with a propane tank that was strapped to a vehicle and a jar full of ether. Brad Espen notified the DEA and the jar was removed. He also determined that the trailer the owners lived in was not contaminated.

On March 6, 2003 the health department met with two different contractors at the lab so they could determine their bid for the decontamination. The contractor was necessary because the health department does not have the capabilities to decontaminate an entire lab. The decontamination would require the removal of the trailer, a bus on the property, the garage, the propane tank and any debris. The septic tank would also be collapsed and the well filled in. The bid from a company called ERS was accepted on June 25, 2003.

On July 22, 2003, ERS started the decontamination of the lab. The first thing to be removed was the trailer. It was torn apart by a backhoe and then placed into big dumpsters that were taken to the landfill. A couple of trucks that were on the property were towed away in order for the workers to have full access to the rest of the property. The second thing that was removed was the garage where the actual lab was located. It was also torn apart and placed into dumpsters. All tires and debris that could not be taken to a landfill were placed on the side of the property to be removed later. The last thing that the workers did was to cut the bus in half and

tip it over. The bus was where most of the concern was focused because it had a lot of debris in it that had not been looked through yet. Luckily, nothing toxic was found in the bus.

On July 23, 2003, the rest of the debris on the property was placed into dumpsters and removed. The workers located the septic tank, cracked it open and pumped it out. After it was pumped, lime was poured into it. The bottom of the tank was also cracked so no water would build up in it then it was covered up again. The well was also dug up four feet into the ground. Bleach was poured into the well and then it was collapsed and covered up again. ERS then called Brad Espen to come to the lab and make sure that everything had been completed. Brad Espen went to the lab and approved of the work.

Critique

According to the recommended response to a methamphetamine lab the Wood County Health Department did the best job that they could. The health department took on the job of handling the decontamination of the lab because none of the other local agencies would, not even the EPA. Brad Espen did not want to see the lab sit there anymore posing a danger to the environment and the people that lived in the area. He wanted the lab to be decontaminated as soon as possible to prevent anyone from being exposed to some potentially hazardous chemicals. He had no plan to go off of since there is not one for Ohio so he created his own by looking at what other states had done.

One thing that Brad could have addressed more was safety. He might not have done it due to inexperience with methamphetamine labs. During the health department's assessment of the lab no one ever wore PPE. They may have exposed themselves to a lot of harmful vapors and toxins that could have been prevented if they had worn their PPE. When the actual decontamination was being done the contractor and his workers started out with PPE, but removed most of it by the end of the day. It may be really uncomfortable and hot, but it is better to be safe than sorry.

Another thing that Brad forgot to do was take samples. He did not sample anything so when he assessed the decontamination and determined it to be finished he was just going off visual appearance. Most hazardous chemicals are colorless or would be hard to detect if they were spilled onto the ground or dumped in nearby water. Brad should have taken samples before

and after to compare and make sure that the lab really was decontaminated. The reason behind him not sampling may have been because the entire lab was being removed and there were no bodies of water surrounding the lab.

Overall, for the materials and information that Brad had available to himself he did a good job. He got the lab decontaminated and made the land inhabitable again. He did all this by finding funding from the county and arranging the contractor. The land is now available for resale at a sheriff's auction and the money made will be used to replenish some of the funding for the decontamination.

CONCLUSION

Overall, decontamination of a methamphetamine lab is a very complicated and dangerous process. Methamphetamine labs are a new thing and guidelines for decontamination are hard to come by due to lack of experience. LEPCs are trying the best that they can to come up with action plans that will accommodate for the decontamination of the labs, but for the mean time since local agencies have no guidance they are making mistakes when decontaminating labs, like in Wood County that could potentially cause sever harm. This means that labs are just sitting there causing unsafe conditions.

REFERENCES

1. Spread of Methamphetamine Labs in Ohio; University of Cincinnati Website. 25 July 2003.
2. Howard, Hank. Clandestine Drug Labs: An Epidemic in the United States; *Fire Engineering.* 1997; Vol. 150 Issue 9.
3. Holton, W. Conrad. Unlawful Lab Leftover; *Environmental Health Perspectives.* 2001, Vol. 109 No. 12, A576.
4. Wayne, Philip B. Life After Meth; *Journal of Property Management.* 2003, Vol. 68 Issue 3, 62-66.
5. Falkenthal, Greg. Clan Labs: A Modern Problem; *Fire Engineering.* 1997, Vol. 150 Issue 9.
6. Bergeron, Lou. Illicit Drugs Factories Create Toxic Mayhem; *New Scientist*. 18 October 1997.
7. Cleanup of Clandestine Methamphetamine Labs Guidance Document; Colorado Department of Public Health and Environment, Hazardous Material and Waste Management Division. 2003. <http://www.cdphe.state.co.us/hm/methlab.pdf>.
8. NIOSH Pocket Guide to Chemical Hazards; Department of Health and Human Services, Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health Website. 2002. <http://www.dhss.state.mo.us/ResourceMaterial/meth.pdf>.
9. ToxFAQs; Agency for Toxic Substance and Disease Registry Website. 2003. <http://www.atsdr.cdc.gov/toxfaq.html>.
10. US Department of Labor Occupational Health and Safety Administration; OSHA Website. 2003. <http://www.osha.gov>.
11. United States Environmental Protection Agency; EPA Website. 2003. <http://www.epa.gov>.
12. Local Emergency Planning Committee Member's Guidebook from the State of Ohio's State Emergency Response Commission. 1998. http://www.lepcinfoexchange.com/docs/lepchand.pdf. 2003.
13. Cleaning Up Hazardous Chemicals at Former Meth Labs; Wisconsin Department of Health and Family Services Website. 2003. <http://www.dhfs.state.wi.us/eh/ChemFS/fs/MethClnUp.htm>.
14. Guidelines for Cleaning Up Former Methamphetamine Labs; Missouri Department of Health and Senior Services Section for Environmental Public Health Website. 2003. <http://www.dhss.state.mo.us/ResourceMaterial/meth.pdf>.
15. Kansas Clandestine Drug Lab Cleanup Program; Kansas Department of Health and Environment Bureau of Environmental Remediation, Assessment and Restoration Website. 2003. <http://www.kdhe.state.ks.us/methlabs/ml_cleanup.html>.
16. Local Emergency Planning Committees; Emergency Management Agency Website. 2003. <http://www.state.oh.us/odps/division/ema/index.htm>.

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