

ATSDR Record of Activity

Routing: 2A7E. Murray B. Fowler ABJ. Holler L. Cseh LCUID #: RAN2Date: 04/17/2008Time: 09:30 am x pmSite Name: Former Mill Building City: Bennington Cnty: Bennington State: VTCERCLIS #: _____ Cost Recovery #: _____ Region: I

Site Status (1) NPL ☒ Non-NPL RCRA Non-Site specific Federal
 (2) Emergency Response Remedial ☒ Other

Activities

Incoming Call Public Meeting* ☒ Health Consult* Site Visit*
Outgoing Call Other Meeting Health Referral Info Provided
Conference Call Data Review Written Response Training
Incoming Mail Other

Requestor: (1) Cathy Young US EPA

Phone: _____ Address: _____

City: _____ State: _____ Zip Code: _____

Contacts and Affiliation

(31) William Sweet Region I ()

() ()

1-EPA	2-USCG	3-OTHER FED	4-STATE ENV	5-STATE HLT
6-COUNTY HLTH	7-CITY HLTH	8-HOSPITAL	9-LAW ENFORCE	10-FIRE DEPT
11-POISON CTR	12-PRIV CITZ	13-OTHER	14-UNKNOWN	15-DOD
16-DOE	17-NOAA	18-OTHR STATE	19-OTHR COUNTY	20-OTHR CITY
21-INTL	22-CITZ GROUP	23-ELECT. OFF	24-PRIV. CO	25-NEWS MEDIA
26-ARMY	27-NAVY	28-AIR FORCE	29-DEF LOG AGCY	30-NRC
31-ATSDR				

Program Areas

Health Assessment Health Studies Tox Info-profile Worker Hlth
Petition Assessment Health Surveillnc Tox Info-Nonprofil Admin
☒ Emergency Response Disease Registry Subst-Spec Resch Other
☒ Health Consultation Exposr Registry Health Education

BACKGROUND AND STATEMENT OF ISSUES:

US Environmental Protection Agency (EPA) Region I requested the Agency for Toxic Substances and Disease Registry (ATSDR) review a letter report from Wilcox & Barton Inc, RE: Facility Inventory, Mace Security International, Docket Number 01-2008-0036, dated March 26, 2008, addressed to Ms. Catherine Young, on-scene coordinator, EPA Region 1. EPA specifically asked ATSDR to determine whether materials identified at a old mill building were properly categorized as waste. Later the EPA request was modified to include a discussion of the public health implications rather than the waste. EPA investigated a citizen report of hazardous material being moved from trailers into a former mill building. The mill building has been partially rebuilt and houses several businesses including a health club and several medical offices. The property is in a mixed residential/commercial area and is bounded on one side by the Walloomsac River, a tributary to the Hoosic River. The proximity to people and the perceived security and structural weakness of the building where the material was now stored concerned the informant. EPA and others investigated, finding >55,000 pounds of the riot control irritant/tear "gas" CS-1 in plastic jugs wrapped with polyethylene-coated cloth, in cardboard boxes within wooden crates. Some of the crates showed damage, but the cardboard boxes seemed undamaged. CS-1 is 95% 2 chlorobenzylidenemalononitrile, also called CS (the military designation), and 5% silica aerogel to improve physical and chemical properties in storage and in use. In addition, the building reportedly has fire suppression issues in that the sprinkler system in the building may not be adequate and one of the fire hydrants outside the building may be inoperative.

Narrative and Data: ATSDR reviewed the Wilcox and Barton inventory described above and identified concerns about the storage of potentially incompatible products at locations identified in the inventory as MS-2 (a metal shelf unit in the laboratory), ST (a storage area located in the shipping department), and CS-2 (second floor of the "cold storage" area). The materials listed at location ST is provided as an example; it contained

- AMMO, 12 gauge shotgun shells containing OC (primed)
- AMMO, 37mm and 40mm, projectiles, primed
- AMMO, 37mm or 40 mm primed shells
- AMMO, CN projectiles, 37mm and 40 mm
- AMMO, CN shells, corroded, in plastic bag
- AMMO, explosives, waste canisters w/ product
- AMMO, Shells
- AMMO, smoke grenade
- AMMO, Smoke grenade dispensers
- AMMO, waste
- AMMO, waste, live
- waste ammo, 12 gauge, 37 and/or 40 mm live ammo
- 450 gallons bulk CS (in cabinet)
- 5 gallons gasoline
- 1 gallon lacquer thinner
- Numerous small containers of various solvents, spray paints, adhesives, and propane

Based on a review of aerial photographs of the location at 160 Benmont, the building where these materials are being stored has residential areas adjacent to it in a arc ranging from just south of due east around to the southwest. In addition, another residential area appears to be located to the north and west of the location. Business and commercial entities are located to east and north of the plant. (<http://maps.google.com/maps?hl=en&tab=wl>) ATSDR Regional staff who have visited the site have described the local area and residents as follows:

The street in front of the mill [to the east] is lined with 3-4 family buildings, signs of many children, many elderly, saw several on oxygen, several "handicapped" signs in windows ... There are other residences nearly as close ...

CS is a lacrimator and riot control agent. Symptoms associated with exposure to the substance include eye and respiratory tract irritation, pulmonary edema, and dermatitis. (HSDB, 2005) Some studies have indicated delayed onset of effects ranging from a few hours to several days (Debarre et al., 1999; Thomas et al, 2002; Karaman et al, 2008). While some studies indicate effects have been reported to end once exposure stopped, other studies indicate health effects to persist for several weeks after exposure (Lewis and Lewis, 2001; Blain, 2003; Hill, 2000; Karagama et al, 2003) The difference in the studies may be due to difference in formulations or in the specific exposure scenarios. In one animal study (Debarre, 1999), the minute ventilation rate of rats was reduced to 29% and remained depressed for 24 hours post-exposure. There is no evidence that CS is a carcinogen (HSDB, 2005). In the absence of severe maternal toxicity, CS is not expected to affect unborn children. (McElhatt et al, 2004).

CS is expected to degrade in the atmosphere over a period of several days. CS in the atmosphere is also subject to both wet and dry deposition. Once deposited in the soil, CS is expected to have a low mobility in the environment and persist for several weeks in the absence of moisture. CS hydrolyzes rapidly and degrades within a few hours in moist environments. (HSDB, 2005) In one study (Hankin and Ramsay, 2007), furniture in a cargo ship was contaminated with CS during transport in an attempt to detect stowaways. When the furniture reached the retail outlets, employees in 16 different stores experienced symptoms of exposure to a lacrimator that were statistically associated with contact with the furniture. This indicates CS can be trapped in fabrics and still cause health effects upon direct contact.

Occupational exposure levels established or recommended for CS in the US are consistent. The OSHA Permissible Exposure Level (PEL) is equal to the American Conference of Government and Industrial Hygienist Threshold Limit Value - Time Weighted Average (TLV), which is equal to the National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL) of 0.05 ppm (0.4 mg/m³). (HSDB, 2005) Irritation in humans begins at 1 mg/m³ with incapacitation at between 2 and 5 mg/m³. The NIOSH Immediately Dangerous to Life and Health (IDLH) concentration is 2 mg/m³, probably based on this incapacitation reducing the ability to escape the contaminant. (HSDB, 2005; RTECS, 2008) More severe effects begin at 10-13 mg/m³ until the lethal doses which begin are 2600 mg/m³ in mammals (RTECS, 2008) In the open outdoor environment, concentrations of most substances in excess of 5-10 mg/m³ are difficult to reach and sustain except in unusual circumstances (e.g., atmospheric inversions, etc.); however, in indoor environments, concentrations can be much larger.

DISCUSSION

ATSDR was initially asked to confirm the accuracy and completeness of the items identified as waste. The definition of waste is a regulatory matter, and as a non-regulatory agency, ATSDR is unable to determine what is and what is not legally waste. EPA later withdrew this request of our agency and asked instead for us to discuss the public health implications of the situation. We examined the listing of materials and identified concerns about the storage of materials in proximity to the building occupants while the building itself is in a residential area.

It is difficult to determine solely from this listing, but it appears that incompatible materials are being stored together without adequate safeguards. We identified storage concerns of potentially explosive materials and hazardous substances. While no leaks have been reported, the presence in a residential community of substances that, without adequate segregation, can react with each other can pose a public health threat.

Our two principal concerns are security from misuse by theft or vandalism, and structural fire, originating with these materials or from other activities in the building. The intermittent nature of the occupancy of the facility as described by those on the scene seems to offer the potential for unnoticed access that is not authorized by the owner of the facility or the materials. It seems particularly inappropriate to store explosives (ammunition) with flammable liquids and 450 gallons of "tear gas". While the applicability of standards to buildings in a community is primarily a matter of local jurisdiction, the existence of federal standards can be instructive about the concerns associated with storing these materials together. Ultimately, these conditions could lead to exposures of the building occupants as well as residents in the surrounding area to substances that could adversely affect their health.

OSHA standards at **29 CFR 1910.109(b)(1)** states: "General hazard. No person shall store, handle, or transport explosives or blasting agents when such storage, handling, and transportation of explosives or blasting agents constitute an undue hazard to life." ATSDR understands that occupational safety officials are involved in this situation and does not intend to anticipate their findings or processes. However, stating this prohibition as a general hazard in their regulations points to the undesirability of storing explosives of any type with other hazards that may be present.

Likewise, although not applicable to this situation, the Department of Transportation (DOT) has established procedures for determining compatibility of cargoes and safe handling. The ammunitions and tear gas present in this building are classified by DOT as hazard groups 1 and 6, respectively, in Table 172.101 of Title 49, Code of Federal Regulations (49 CFR). In none of the transport-mode specific requirements of 49 CFR are these groups allowed to be shipped together without stringent controls to prevent any interaction. Again, similar storage requirements in fixed storage are usually the purview of local authorities, such as the cognizant fire marshal. However, the prohibition in transport is in line with the general hazard definition of OSHA above and points to the potential for an unsafe situation whenever explosive and hazardous substances are handled together.

As discussed above, CS is a potent irritant with the potential to cause incapacitating respiratory effects in healthy adults. Individuals with pre-existing respiratory conditions and children are likely to be more susceptible to these effects than adults and may suffer additional harm due to their susceptibility. As observed by our regional staff, the community adjacent to the building seems to have a large number of individuals that could be more sensitive to CS. In addition, the number of homes with "handicapped" signs displayed indicates that protective measures may be difficult to implement effectively in a timely manner. For instance, it has been demonstrated in multiple incidents that evacuating handicapped individuals takes longer than more mobile populations.

The effects of a release of a large amount of CS that might occur despite the best efforts to prevent such a release could be made worse if the explosives stored with the CS were set off by the same mechanism that cause the release. A potential explosion may be sufficient to open a pathway from the interior of the building to the open environment around the building and may increase the dispersion of the lacrimator into the surrounding residential areas.

Assuming the material is in appropriate packaging, the fact that this packaging is apparently undamaged implies that the immediate risk is limited as long as the materials are undisturbed. However, the combination of a poorly secured storage area, the storage of possibly incompatible products, and the presence of others in the facility unaware of the possible hazards suggest a foreseeable threat to the safety of the occupants and surrounding community. Given the foreseeable hazards, the risk to the occupants of the building and to the community should be considered unacceptable, if an alternative provides greater safety.

CONCLUSIONS:

From the information provided, ATSDR concludes the following.

- The storage of explosives (ammunition), flammable liquids, and "tear gas" in a mixed occupancy building in a residential neighborhood presents an undue risk to public health and safety.
- The possible storage of incompatible materials could result in an adverse event which could have potentially severe health consequences.

RECOMMENDATIONS

- Continue to coordinate the response to the storage of possibly incompatible products or wastes with the appropriate state or local authorities, such as the cognizant fire marshal.
- Prudent public health practice in this instance dictates that these materials be:
 - removed from this site for disposal or
 - removed to an appropriate site and stored safely, as dictated by appropriate authorities.

Signature: Richard A. Nix Date: 04-23-2008

cc: ATSDR I

ATSDR DRO

REFERENCES

29 CFR 1910.109

49 CFR Subchapter C (parts 171-176)

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Debarre S, Karinhi L, Delamanche S, Fuche C, Desforges P, and Calvet J. 1999. Comparative acute toxicity of o-chlorobenzylidene malononitrile (CS) and oleoresin capsicum (OC) in awake rats. Human and Experimental Toxicology. December 1999.

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McElhatt P, Sidhu S, and Thomas S. 2004. Exposure to CS gas in Pregnancy. Journal of Toxicology and Clinical Toxicology.

RTECS. 2008. Malononitrile, o-chlorobenzylidene. Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. Cincinnati, OH. February 2008. Available at www.cdc.gov/niosh/rtecs/oo381378.html.

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Wilcox and Barton letter to Ms. Catherine Young, US EPA, dated March 26, 2008 containing a comprehensive inventory of Suite 1 of the Vermont Mill.