

# Metallic Mercury Vapor Indoor Air Monitoring at the Bryn Athyn High School Mercury Spill Response and Cleanup



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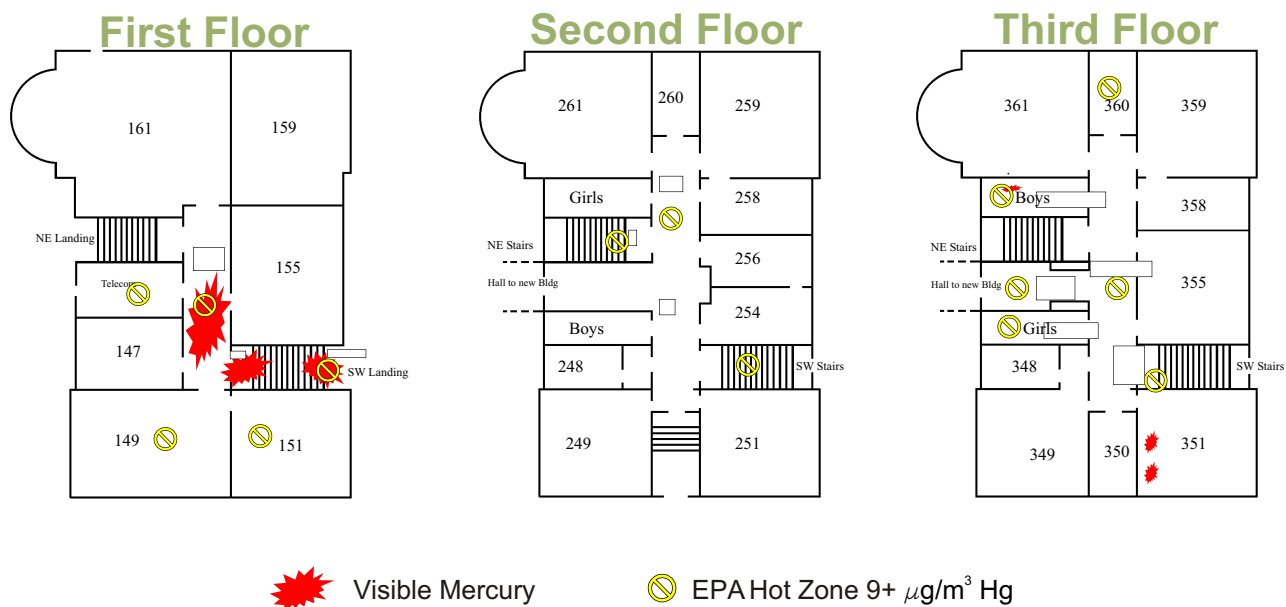
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## Abstract

On February 12, 2002, a spill of mercury occurred at the Academy of the New Church (“school”) located in Bryn Athyn, Pennsylvania. Metallic mercury was taken from a laboratory and spilled at least at one known location by an individual. The local hazmat team responded to the incident and conducted a gross decontamination of the suspected source areas. Later attempts were made by the contractor working for the school to conduct an additional cleanup of the spill. On February 14, 2002, EPA was on hand to provide technical assistance. On February 17, 2002, at the request of USEPA Region III, the USEPA Environmental Response Team conducted mercury vapor monitoring using real time instrumentation (Jerome, Lumex RA915<sup>+</sup> and Tracker 3000), and conducted air sampling using the NIOSH method in selected areas of Decharms Hall during the cleanup operation.



## Decontamination Procedures

All decontamination was performed by Lewis Environmental. Decontamination procedures included vacuuming contaminated areas with mercury vacuums, stripping floors, applying mercury vapor suppression solution to the surfaces, removing carpeting and tiles, and coating all floor surfaces with a sealant to trap residual metallic mercury, if required. The decontamination and follow up ambient air monitoring and sampling cycle was repeated until acceptable mercury vapor concentrations were achieved as determined by the U.S. EPA WAM and OSC in the consultation ATSDR .

## Real Time Mercury Vapor Monitoring Results

Real time indoor air monitoring for mercury vapor concentration was performed at the Decharms Hall building on 17, 18, 21 February and on 7 and 17 March 2002 using the Tracker 3000 and Lumex RA-915<sup>+</sup> Mercury Vapor Analyzers. The highest mercury vapor concentrations were consistently recorded in the 1st. floor hallway/stairway locations. A mercury vapor level over 100 micrograms per cubic meter (µg/m³ ) was recorded with the Tracker 3000 on 18 February 2002. The mercury vapor concentrations were approximately 2 µg/m³ at the same locations after completion of the decontamination procedures on 17 March 2002. The results are presented in Table 1.

Table 1  
Real-Time Mercury Vapor Monitoring Results µg/m³

Building Floor	2/17/02	2/18/02	3/7/02	3/17/02
1 st Floor	1.6-56	2.4-100	2.0-4.0	0.1-2.1
2 nd Floor	1.3-41	3.0-46	1-13	0.1-6.7
3 rd Floor	1.0-40	3.0-16	3.0-4.0	0.1- 2.8



Mercury Monitoring: NIOSH 6009, Lumex and Tracker



Mercury Spill Site

## NIOSH Mercury Vapor Air Sampling

Indoor air sampling for mercury vapor analysis was performed at the Decharms Hall building on 18 February and on 7 and 17 March 2002. The locations were selected based on real time monitoring results. The highest mercury vapor concentration was measured at 15 µg/m³ in the first floor stairway location on 18 February 2002. The mercury vapor concentration was 2.2 µg/m³ at the same location after completion of the decontamination procedures on 17 March 2002. A summary of the indoor air sampling analytical results is provided in Table 2.

Table 2  
NIOSH 6009 Mercury Vapor Monitoring Results µg/m³

Sampling Locations	Feb. 18, 2002	March 07.2002	March 17.2002
Room 149	NS	1.6	0.2
Room 151	2.9	2.0	0.16
1st floor stairway	15	7.1	2.2
3 <sup>rd</sup> Floor Hallway	5.0	NS	0.29
Room 360	12.5	2.0	0.08
Room 361	2.8	1.1	<0.06
3 <sup>rd</sup> floor stairway	NS	5.4	NS
2nd Floor Hallway	3.7	2.5	0.17
Room 351	NS	0.31	0.14

## Conclusions

The EPA/ERT provided effective technical support in monitoring mercury clean up operations at the High School using real time instrumentation and the NIOSH method. The action level set up by the EPA with ATSDR were achieved, and the building was back in operation four weeks after the deliberate spill by a student. The local police were able to locate the responsible student within two weeks of the incident.

## Acknowledgments and Disclaimer

The authors wish to thank Dennis Kalnicky of REAC for his technical support, and Charles Gasser of REAC for his analytical support. The cleanup strategies and analytical methods described here were modified/developed to meet U.S. EPA/ERT/REAC field and laboratory requirements for cleanup monitoring of indoor metallic mercury vapor and may not be applicable to the activities of other organizations. Mention of trade names or commercial products does not constitute endorsement or recommendation for use. The work was performed under contract with Lockheed Martin Inc. (contract no. 68-C99-223).