

United States Environmental Protection Agency
Region V
POLLUTION REPORT

Date: Wednesday, September 7, 2005

From: Steven Renninger

To:	Dale Farmer, Ohio EPA	David Chung, US EPA
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	Distribution List, National Response Center	

Subject: Initial & Final POLREP
Cincinnati Styrene Response
351 Wilmer Ave, Cincinnati, OH
Latitude: 39.1076660
Longitude: -84.4284360

POLREP No.:	1	Site #:	
Reporting Period:	August 28, 2005 to September 1, 2005	D.O. #:	
Start Date:	8/28/2005	Response Authority:	CERCLA
Mob Date:	8/28/2005	Response Type:	Emergency
Demob Date:	9/1/2005	NPL Status:	Non NPL
Completion Date:	9/1/2005	Incident Category:	
CERCLIS ID #:		Contract #	
RCRIS ID #:			

Site Description

An Ohio-Indiana Rail System railcar began releasing styrene at approximately 1830 on Sunday, August 28, 2005 in the vicinity of Lunken Airport. The railcar was alone on the railroad tracks between Eastern Avenue and Wilmer Avenue, Cincinnati, Hamilton County, Ohio. The railcar was loaded with styrene from West Lake Chemical Company (West Lake), Houston, Texas. Capacity of the railcar is 180,000 pounds of material (24,000 gallons), and according to West Lake representatives, the railcar was loaded with approximately 171,000 pounds of styrene. The railcar was originally loaded with inhibitor material to stabilize the styrene. The railcar apparently sat inactive for several months, allowing the inhibitor material to break down. Eventually, styrene in railcar began polymerizing and venting from the relief valve on railcar.

Cincinnati Fire Department (CFD) responded to the scene at 1835 and observed a large plume emitting from a lone railcar. CFD immediately excavated residents directly downwind of the plume and began applying water to venting railcar. Approximately 30 homes along Eastern Avenue within 1,000 feet of the railcar were evacuated. Additionally, a shelter in place advisory was issued for surrounding neighborhoods. U.S. EPA Region 5 was notified via the National Response Center (NRC) at 20:25 on 8/28/05. The NRC report (#770661) was made by Indiana and Ohio Rail System. Lunken Airport was closed.

Current Activities

U.S. EPA tasked START to conduct air monitoring at 1945 on 8/28/05. START collected area monitoring data using styrene Draeger tubes and a MultiRAE to monitor for volatile organic compounds (VOCs). No elevated levels were detected in the five neighborhoods downwind of the rail car. CFD continued to apply water to the railcar. Venting had significantly decreased by 0000 on 8/29/05. CFD continued to apply water on the railcar through the early morning on 8/29/05.

At approximately 0600 on 8/29/05, venting increased from the railcar and a large plume of material was released. Additional response resources were requested. U.S. EPA OSC Renninger responded to the scene and requested START assistance. The Cincinnati Chemical Air Monitoring (CAM) Team was also activated to provide air monitoring support. The Center for Toxicology and Environmental Health

(CTEH) teams responded on behalf of Westlake. U.S. EPA, CAM Team, and CTEH coordinated air monitoring activities. Due to the increased venting from the railcar and the threat of explosion, all response personnel maintained a ½ mile perimeter when possible. Unmanned hoses continued to apply water to the railcar. An incident command post was established at the Lunken Tennis Center near the intersections of Beechmont and Wilmer Avenue. Cincinnati Police Department (CPD) and CFD ordered the evacuation of all residences and businesses within a one mile radius. The Red Cross established a shelter in Hyde Park to accommodate evacuated residents. Approximately 800 people were evacuated from the East End neighborhood.

CAM teams began air monitoring within the evacuation area using MultiRAE and ppbRAE instruments. START began monitoring the perimeter using MultiRAE and Rapid Assessment Tools (RAT) software. CTEH established monitoring areas and set-up AreaRAEs for continuous monitoring. A central database for air monitoring data was established by EPA at the incident command post. While teams performed air monitoring throughout the evacuation area and beyond, CFD continued to apply water to the railcar using unmanned hoses. Due to the threat of explosion, it was determined that response personnel would not approach the railcar until additional information was gathered about the railcar. Venting from the railcar continued throughout the morning. Briefings were held every 1 to 1 ½ hours at the command post. Mayor Luken declared a state of emergency in the city and the U.S. Coast Guard shut down the Ohio River to traffic. A shelter in place advisory was also issued for Fort Thomas, Kentucky, directly across the Ohio River from the incident.

By 1500 on 08/29/05, a live video feed was established at the incident command post allowing the release from the railcar to be monitored remotely. CAM, EPA-START and CTEH teams continued continuous air monitoring throughout the affected area. EPA-START collected styrene Draeger tubes and VOC readings across the river in the Ft. Thomas, KY and detected no styrene in the area. Plume models were generated using the National Atmospheric Release Advisory Center (NARAC) web based modeling system to ensure the appropriate evacuation area in case of explosion. These models were continuously updated throughout the response. CFD continued to apply water to the railcar as it continued to vent.

By 1900 on 08/29/05, the evacuation area was reduced to ½ mile radius from the incident. The Ohio River was reopened to traffic and the shelter in place advisory for Ft. Thomas was lifted. The railcar continued to vent and CFD continued to apply water. Representatives from West Lake were expected on-site this evening to provide additional information about the material in the railcar. CAM, EPA-START, and CTEH teams continued air monitoring.

West Lake representatives arrived on-scene at approximately 0920 on 08/29/05. They provided input to discussions with CFD, CPD, and U.S. EPA about how to stop the venting from the railcar. West Lake suggested monitoring the temperature of the railcar to determine if the styrene venting reaction is decreasing in the railcar. They also suggested circulating water through the steam jacket of the railcar to speed up the cooling process. It was determined that CFD would continue to cool the car with water through the night and West Lake representatives, accompanied by CFD personnel, would approach the railcar in the morning to collect temperature readings and establish connections with the railcar to circulate water through the steam jacket. CAM, CTEH, and EPA-START teams continued air monitoring on a 24-hour basis.

The railcar continued to vent through the night on 8/29/05 and into the morning of 08/30/05. At 0730 on 08/30/05, West Lake and CFD teams began preparations to approach the railcar. Venting from the railcar appeared to increase slightly in the morning of 08/30/05, possibly from a blown gasket around the manway of the railcar. CAM, EPA-START, and CTEH teams continued air monitoring through the East End neighborhood. A ½ mile evacuation area remained in place.

West Lake and CFD teams approached the railcar around 1400 on 08/30/05. Temperature readings were collected at the tank saddle and manway area. The temperature at the tank saddle was 270 °F and 230 °F at the manway. Water was hooked up to the right side of the railcar and circulated through the steam jacket.

A follow-up briefing was held once the initial monitoring at the railcar was performed. While near the railcar, West Lake personnel determined the venting was currently occurring from a failed gasket around the manway. Additional temperature readings would need to be collected to determine if the styrene reaction in the railcar was slowing down. CFD would also work with West Lake to find the additional fittings needed to connect the left side of the railcar's steam jacket to water in order to speed the cooling process. CAM, START, and CTEH teams continued air monitoring throughout the day. Styrene Draeger tubes and VOC readings continued to show elevated levels of styrene in the evacuation area due to the venting from the railcar.

West Lake and CFD connected the left side of the railcar steam jacket to water at approximately 1800 on 08/30/05. Additional temperature readings were collected through the evening and into the morning of 08/31/05.

Railcar Temperature Measurements

Date Time Temperature at Manway (°F) Temperature at Saddle (°F)

30-Aug 1510	230	270
30-Aug 1830	270	230
30-Aug 2030	272	217
31-Aug 0900	126	105

Due to the continued venting from the railcar throughout the day and evening of 08/30/05 and the air monitoring results from the CAM, EPA-START, and CTEH teams indicating elevated levels of styrene still present in the evacuation area, the evacuation order remained in place through the night of 08/30/05. CAM and CTEH teams continued air monitoring on a 24-hour basis.

At approximately 0100 on 08/31/05, venting from the railcar significantly decreased. Temperature readings collected at 0900 on 08/31/05 showed the railcar temperature continued to decrease, indicating a slow down in the styrene reaction in the railcar. Air monitoring data from CAM, EPA-START and CTEH teams throughout the neighborhood indicated no elevated levels of styrene were being detected as of 0900 on 08/31/05. At 0930 on 08/31/05, Mayor Luken lifted the evacuation order for the surrounding area. An exclusion zone of 100 feet was maintained around the railcar and CFD continued to cool the railcar with water. Lunken airport was re-opened.

The City of Cincinnati established a hotline for returning residents to call if they had concerns about returning to their home. CTEH continued to perform air monitoring around the railcar to ensure the safety of returning residents. A Scribe database containing the CAM, EPA-START, and CTEH teams air monitoring data is available under the documents section of this website.

Between September 1-5, 2005, Westlake and Ohio-Indiana Rail System sampled the railcar, replaced gasket and relief valve, and removed the car from the site.

Planned Removal Actions

None

Next Steps

Four closeout issues were discussed on 08/31/05. OSC Renninger requested an air monitoring plan to continue monitoring in the area be generated by CTEH on behalf of Ohio-Indiana Rail System and Westlake until the car was removed. CTEH would also work with the City of Cincinnati Health Department to screen any residential areas as needed. Dale Farmer, Ohio EPA OSC, was to approve a plan to conduct soil sampling around the railcar and investigate the fate of run-off water from the area. Secondly, OSC Farmer was to follow up on the disposal of the railcar and any remaining waste from the incident.

Key Issues

Elevated levels of styrene were detected around the leaking rail car from August 29-30, 2005.

response.epa.gov/cincinnati styrene response