



NATIONAL TRANSPORTATION SAFETY BOARD - **Public Hearing**

Conrail Derailment in Paulsboro, NJ with Vinyl Chloride Release

|                |          |
|----------------|----------|
| <b>GROUP</b>   | <b>3</b> |
| <b>EXHIBIT</b> |          |
| <b>BC</b>      |          |

Agency / Organization

**IMAAC**

Title

**Interagency Modeling and Atmospheric  
Assessment Center (IMAAC) Exposure  
Map**



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# IMAAC

**Interagency Modeling and  
Atmospheric Assessment Center**

## **REAL WORLD**

# ***Train Derailment Containing Vinyl Chloride in Paulsboro, NJ***

30NOV2012 1417Z

**RFI – 1129U**

**30NOV2012**

**Requestor: Philip Quach, NOC**

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Date: 30NOV2012

Other requests for this document shall be referred to:

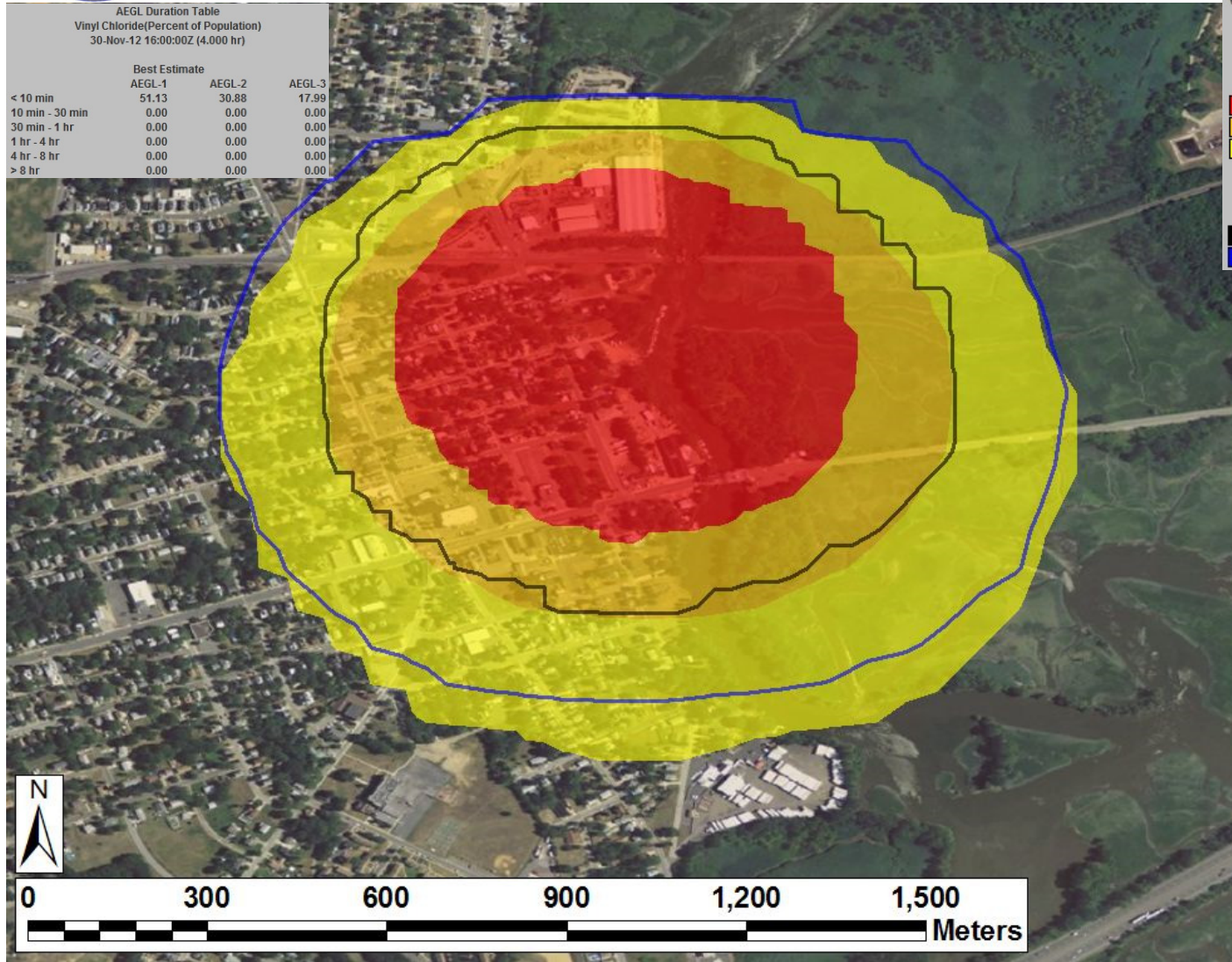
Defense Threat Reduction Agency  
8725 John J. Kingman Rd, MS 6201  
Fort Belvoir, VA 22060-6201

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# Vinyl Chloride – Initial Response



| AEGL Duration Table<br>Vinyl Chloride(Percent of Population)<br>30-Nov-12 16:00:00Z (4.000 hr) |               |        |        |
|--|---------------|--------|--------|
|  | Best Estimate |        |        |
|  | AEGL-1        | AEGL-2 | AEGL-3 |
| < 10 min   | 51.13         | 30.88  | 17.99  |
| 10 min - 30 min  | 0.00          | 0.00   | 0.00   |
| 30 min - 1 hr  | 0.00          | 0.00   | 0.00   |
| 1 hr - 4 hr  | 0.00          | 0.00   | 0.00   |
| 4 hr - 8 hr  | 0.00          | 0.00   | 0.00   |
| > 8 hr   | 0.00          | 0.00   | 0.00   |

| Vinyl chloride : Acute Exposure Guideline Levels (INTERIM)<br>30-Nov-12 16:00:00Z (4.000 hr)<br>"Best Estimate" - Mean Contours |       |                       |
|---|-------|-----------------------|
|   | Value | In contour population |
| Death Possible  | 3.0   | 293                   |
| Injury Possible   | 2.0   | 538                   |
| Threshold   | 1.0   | 992                   |
| Worst Case (w/meander)  |       |                       |
|   | Value | In contour population |
| 10% Death Possible  | 3.0   | 535                   |
| 10% Injury Possible   | 2.0   | 913                   |

This quick response used a weather prediction model; and was not coordinated with other IMAAC participants. Coordination will follow, and product will be updated as needed.

### FACTS

Paulsboro, NJ  
 Location: 39.834044° N / 75.237884° W  
 Event Time: 1200Z (0700 Local)  
 30NOV2012  
 Amount: Vinyl Chloride  
 Dissemination: Train derailment/Leak  
 Weather: 12 km NAM  
 Model: HPAC 5.1  
 Static Population Estimates:  
 LandScan 2011



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## Acute Exposure Guideline Levels (AEGLs) – INTERIM

**Death Possible (AEGL-3):** The concentration in air of a substance at or above which it is predicted that the general population could experience life-threatening health effects or death.

**Injury Possible (AEGL-2):** The concentration in air of a substance at or above which it is predicted that the general population could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

**Threshold (AEGL-1):** The concentration in air of a substance at or above which it is predicted that the general population could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are reversible upon cessation of exposure.

| Acute Exposure Guideline Levels (INTERIM)<br>"Best Estimate" - Mean Contours |       |                       |
|--|-------|-----------------------|
|  | Value | In contour population |
| Death Possible   | 3.0   | Values Vary           |
| Injury Possible  | 2.0   |                       |
| Threshold  | 1.0   |                       |
| Worst Case (w/wx uncertainty)  |       |                       |
|  | Value | In contour population |
| 10% Death Possible   | 3.0   | Values Vary           |
| 10% Injury Possible  | 2.0   |                       |

**90% confidence level that an AEGL-3 or AEGL-2 outcome is possible, based on atmospheric effects and weather uncertainty.**

EPA: "Acute\* Exposure Guideline Levels (AEGLs), are intended to describe the risk to humans resulting from once-in-a-lifetime, or rare, exposure to airborne chemicals. The National Advisory Committee for AEGLs is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills, or other catastrophic exposures.

\*Definition: Acute exposures are single, non-repetitive exposures for not more than 8 hrs"

**INTERIM AEGL Values:** *The interim AEGL status represents the best efforts of the NAC/AEGL Committee to establish exposure limits and the values are available for use as deemed appropriate on an interim basis by federal and state regulatory agencies and the private sector.*

**Notes:** In accordance with EPA guidelines, the published AEGL times are at 10 min, 30 min, 1 hr, 4 hr and 8 hr only. Using these published guidelines from the EPA, DTRA developed HPAC 5.0 to plot human effects in a time weighted manner that better estimates the AEGL effects. For exposure times below 10 min AEGL values are extrapolated based on existing data fit. For most releases very short times tend to dominate AEGL exposure and therefore extrapolated data are dominant. Numerical figures are based upon a population database (LandScan). LandScan is based on the 2000 census for the U.S. (other nations vary), overhead imagery, geo-economic, and other observable data and was updated in 2011. Population is assumed static for calculations. The population numbers next to associated hazard levels are the people contained within the entire contour based, **based upon average day and night** time LandScan 2011 data. **Also available are the average day or night** time LandScan 2011 data. For planning purposes, estimates are assumed to be accurate within +10/-5%. Validation testing indicates agreement within 20% for select examined areas. The population data will not predict major shifts in personnel such as relocations (i.e.: religious pilgrimages, refugees, evacuations), events (i.e.: inaugurations, Olympics), or other population shifts. In such cases the population database needs to be updated to reflect actual conditions.