# Fact Sheet:
# Lawrence Berkeley National Laboratories Study of Unoccupied Trailers

## What did CDC do?

CDC collaborated with Lawrence Berkeley National Laboratories (LBNL), a federal agency, to study indoor emissions of volatile organic compounds (VOCs), including formaldehyde, in four vacant FEMA-supplied travel trailers.

The study looked at air levels for the whole trailer and at gases released from specific parts of the trailer, such as walls, floors, ceilings, tables, and cabinets. After LBNL and CDC took whole-trailer measurements at FEMA's Purvis, Mississippi, storage yard, CDC staff took each trailer apart, then collected, packaged, and shipped the parts to Lawrence Berkeley National Laboratories, where laboratory staff tested the parts in small chambers to determine the type and extent of VOCs each part emitted.

## What trailers were studied?

CDC studied four trailers each made by a different company:

- Pilgrim International,
- Gulfstream Coach Cavalier,
- Thor Industries Dutchmen, and
- Coachmen's Spirit of America.

Each trailer was in excellent condition.

## What did the laboratory testing find?

The laboratory found 33 compounds that might affect people's health. Only formaldehyde, phenol, and TMPD-DIB* (which is used to make plastic) were found at higher levels in the trailers than commonly found in site-built or manufactured homes. Neither phenol nor TMPD-DIB levels, however, were at levels that are a health hazard.

In the study of four vacant trailers, CDC found that the amount of formaldehyde given off by each trailer part was not higher than the limit set by the U.S. Department of Housing and Urban Development for mobile homes. Yet for each trailer as a whole, formaldehyde levels were higher than those normally found in site-built or manufactured homes. This may be because the trailers

- use more composite wood products, such as thin particleboard, than site-built or manufactured houses,
- have more composite wood products in a smaller space than site-built or manufactured homes, and
- let in less fresh air than does a site-built or manufactured house.

* 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate

CDC is a federal public health agency under the U.S. Department of Health and Human Services.

FEMA

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## What this means

The purpose of this study was to identify VOC sources in FEMA-supplied travel trailers. The study will help lead to ways to reduce VOC emissions and exposure in travel trailers. Although formaldehyde levels in each of the whole trailers were higher than is normal in site-built or manufactured homes, no one can make conclusions about FEMA's entire fleet of trailers based on this study of only four trailers.

## What will CDC do next?

CDC will work with the National Aeronautics and Space Administration (NASA) to study new ways to reduce the concentrations of formaldehyde and other VOCs in travel trailers and mobile homes. Manufacturers of travel trailers and government agencies involved in their design should use materials that give off less formaldehyde and find ways to increase the flow of fresh air into the trailers. They should also study whether these improvements will reduce formaldehyde levels. This study did not compare trailers purchased "off the lot" by FEMA to those designed specifically for FEMA use. CDC plans to review data from their study of 519 occupied FEMA-supplied trailers and mobile homes to find out if we can make such a comparison.