

ETHYL ACETATE (C₄H₈O₂)

Chemical Abstracts Service (CAS) Number: 141-78-6

General Information

Ethyl acetate is a colorless liquid with a fragrant, fruity odor. It is the ester of ethanol and acetic acid. Ethyl acetate can affect you when breathed in and by passing through your skin. Acute (short-term) inhalation exposure to high levels of ethyl acetate can cause you to feel dizzy, lightheaded, and to pass out. Chronic (long-term) exposure to ethyl acetate can affect the liver and kidneys. Exposure to ethyl acetate may also decrease fertility in males. There is no evidence of increased cancer risk from exposure to ethyl acetate.

Sources

- Ethyl acetate is used as a solvent, a synthetic flavoring substance, and in making perfumes and dyes. It is also used for decaffeinating tea and coffee.
- Human exposure to ethyl acetate may occur through inhalation of vapors, ingestion of the liquid, or contact with skin.

Indiana Emissions

Ethyl acetate emissions totals are not available from the National Emission Inventory (NEI) for the 2014 calendar year.

Measured Concentration Trends

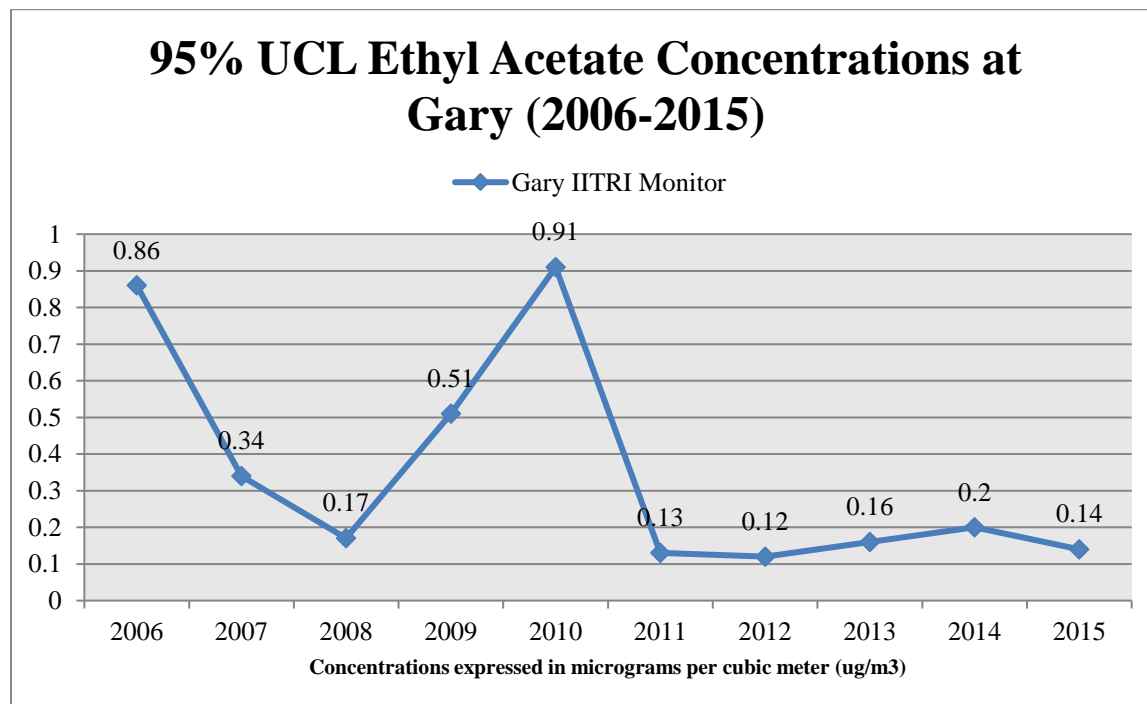
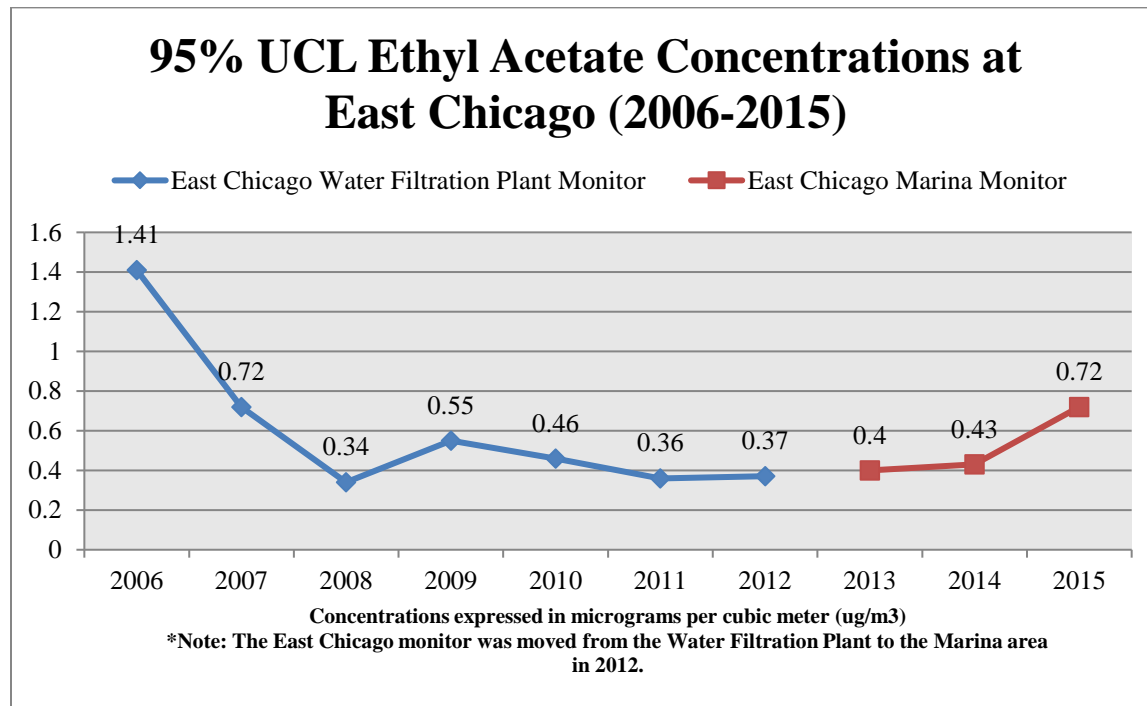
Ambient air monitoring data most accurately represents a limited area near the monitor location. All monitors for air toxics sample every sixth day. The monitoring locations by themselves are not sufficient to accurately characterize air toxic concentrations throughout the entire state, however, results from the monitors will provide exposure concentrations with a great deal of confidence at the monitoring locations.

The ambient air monitoring results were analyzed using U.S. EPA recommended statistical methods. IDEM evaluated the data so that a 95% upper confidence limit of the mean (UCL) could be determined. A 95% UCL represents a value which one can be 95% confident that the true mean of the population is below that value.

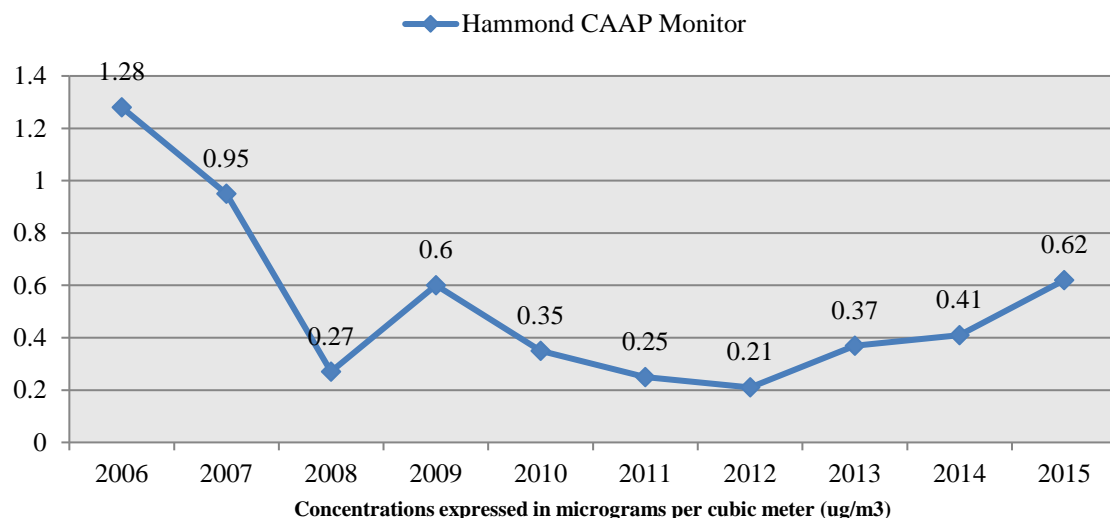
To learn more about the current monitoring locations, please visit IDEM's Air Toxics Monitor Siting webpage at: <http://www.in.gov/idem/toxic/2337.htm>

Data analysis was performed for each monitor that operated for the majority of 2015 and each historical monitor that operated for a significant portion of the analysis period. This analysis determined the detection rate, which is defined as the percentage of valid samples taken statewide that had a quantifiable concentration of the pollutant. The statewide detection rate of ethyl acetate for the monitors analyzed from 2006-2015 was 58.2%. This detection rate was

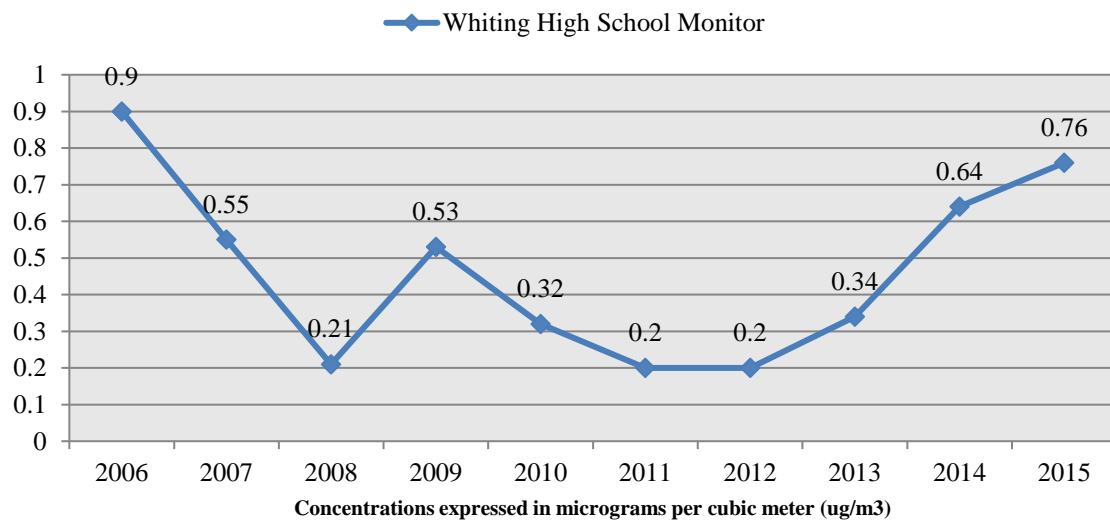
sufficient to perform a trend analysis, but too low to support a high level of confidence in the results. Trend graphs for each of these monitors are provided below.



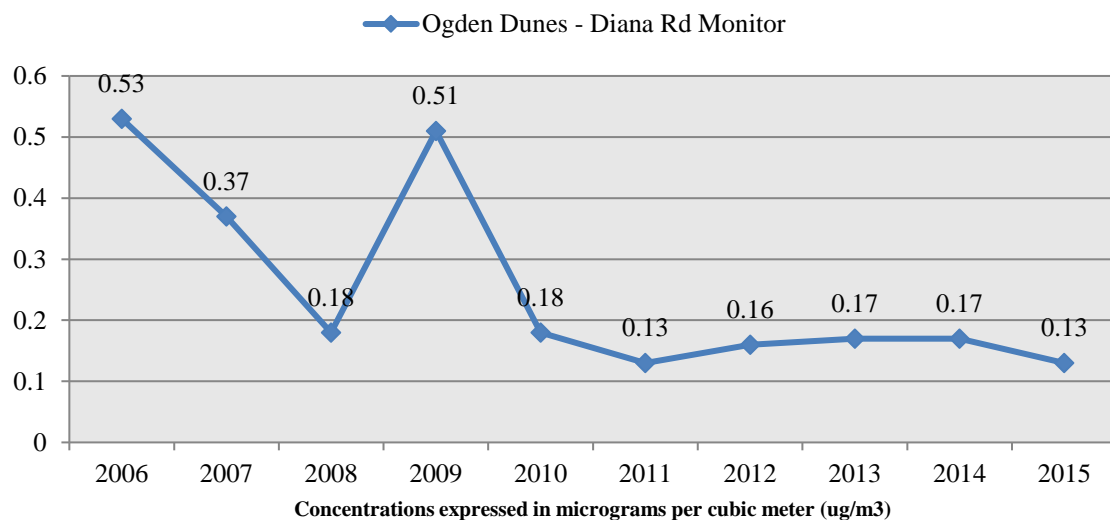
95% UCL Ethyl Acetate Concentrations at Hammond (2006-2015)



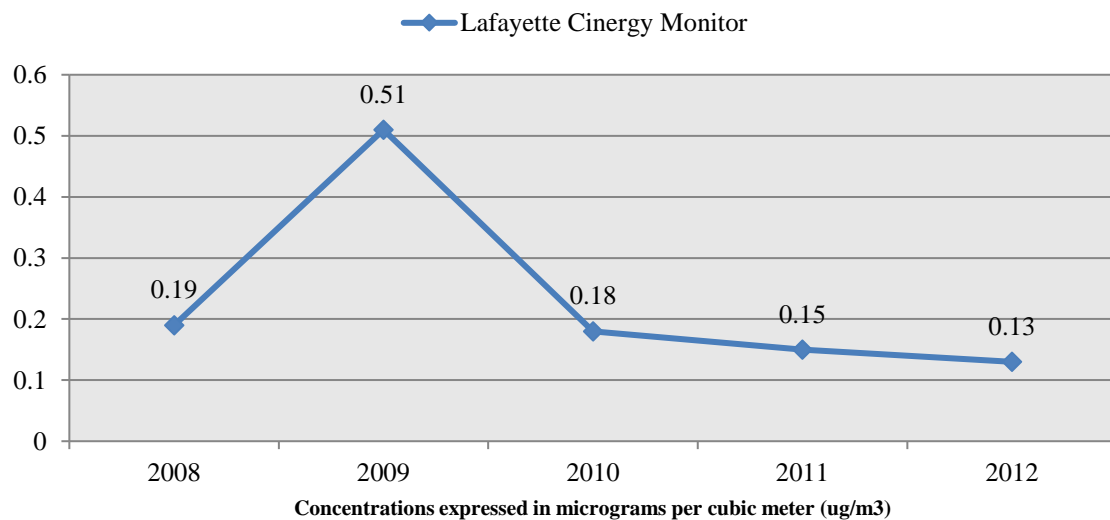
95% UCL Ethyl Acetate Concentrations at Whiting (2006-2015)



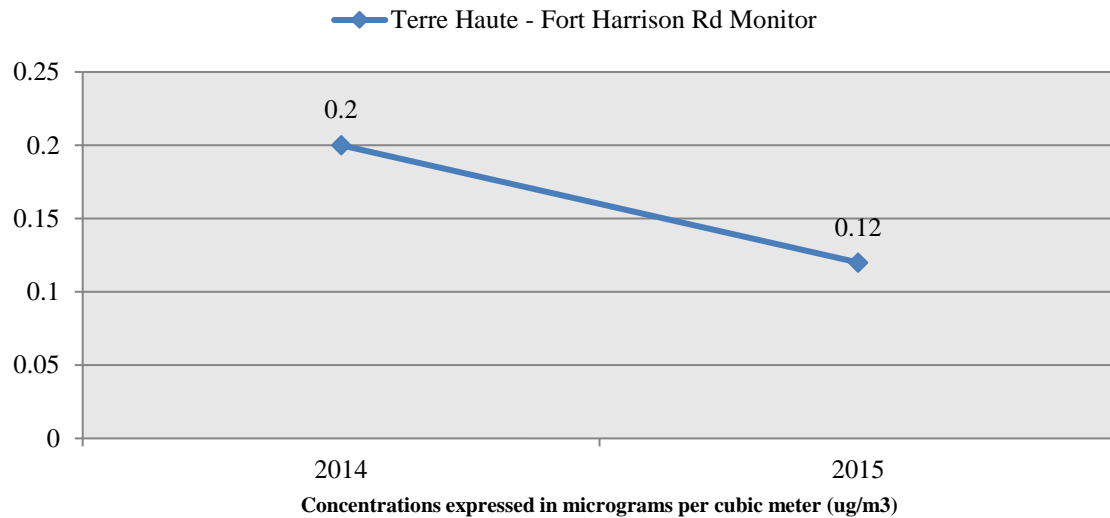
95% UCL Ethyl Acetate Concentrations at Ogden Dunes (2006-2015)



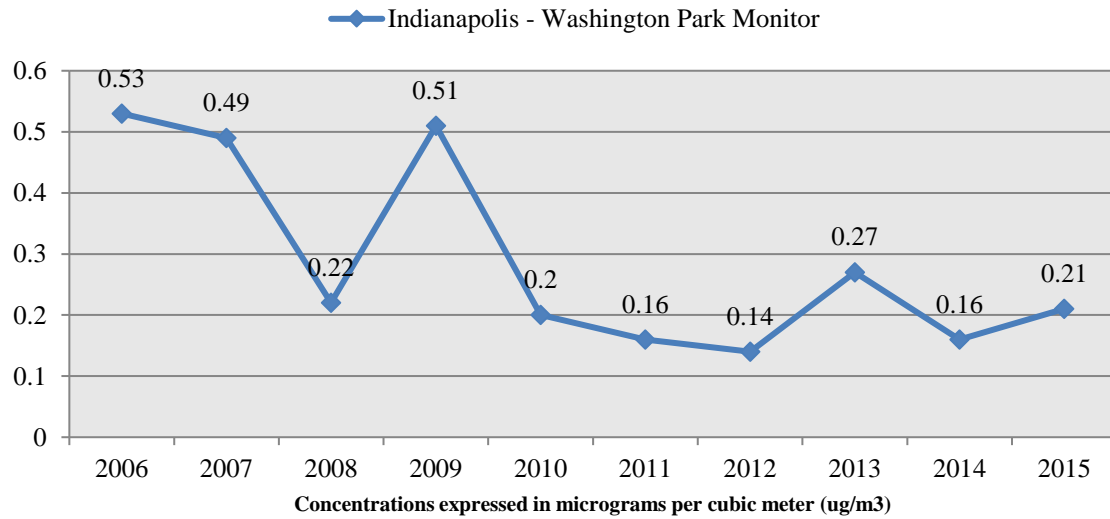
95% UCL Ethyl Acetate Concentrations at Lafayette (2008-2012)



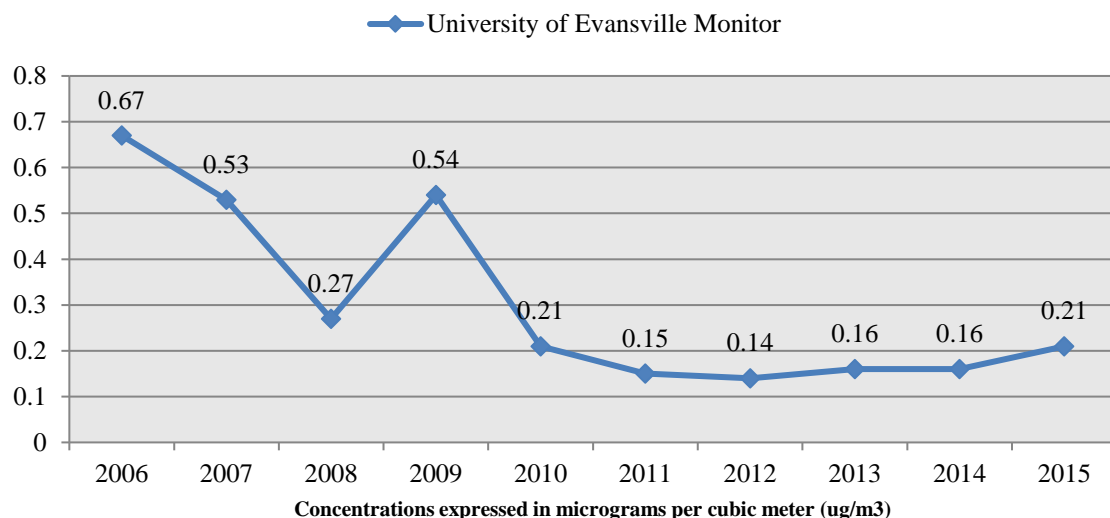
95% UCL Ethyl Acetate Concentrations at Terre Haute (2014-2015)



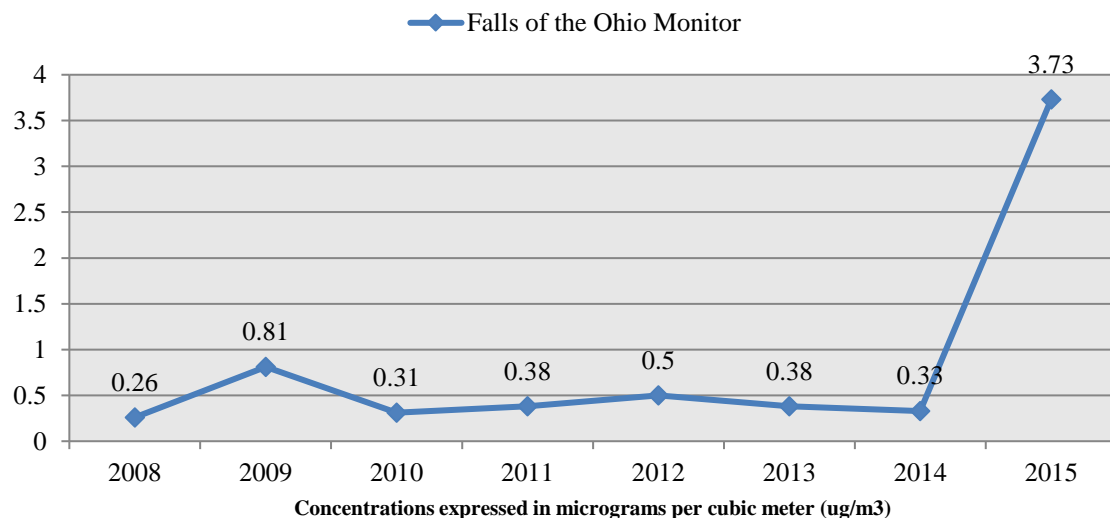
95% UCL Ethyl Acetate Concentrations at Indianapolis (2006-2015)



95% UCL Ethyl Acetate Concentrations at Evansville (2006-2015)



95% UCL Ethyl Acetate Concentrations at Clarksville (2008-2015)



The analysis of monitoring data from 2006 to 2015 indicates that concentrations of ethyl acetate have declined and remained relatively stable at most monitors. The exception to this general trend appears to be clustered in the northwest corner of the state where monitors in East Chicago, Hammond, and Whiting indicate a trend of increasing concentrations from 2013-2015. Despite the increasing trend, average concentrations for these monitors continue to be far below the reference concentration for ethyl acetate. This indicates that no health effects would be expected

from the recorded concentration levels. More information about the reference concentration can be found in the hazard quotient section below.

The one exception that exists outside the northwest corner of Indiana is a dramatic spike in 2015 at Clarksville. The overall set of readings for 2015 appear to have moderately increased from previous years, but the calculated concentration was heavily skewed by an unusually high reading of 40.93 recorded on 7/17/2015. This reading appears to be an outlier in the data, and no pattern of readings this extreme could be found in the full 2015 data set. The high reading of 40.93 is still well below the reference concentration of 125.00 and would not be expected to cause health effects.

Hazard Quotient

IDEM evaluates chronic (lifetime) non-cancer hazard assuming a threshold for each pollutant at which a health effect can be observed. That is, it assumes safe exposure to the pollutant up to a certain level before it is possible to experience a health effect from breathing the pollutant. IDEM uses health protective assumptions by taking into account people who might be more sensitive to the pollutants. The hazard quotient is a ratio that divides the measured concentration of a pollutant by the reference concentration (RfC). A hazard quotient under 1.0 is commonly recognized to be below the health-protective level. Hazard quotients over 1.0 indicate that further investigation may be necessary and does not necessarily mean that health effects are expected. Given the many health-protective assumptions used in the evaluation, most non-cancer hazards over 1.0 are still unlikely to be associated with observable adverse health effects.

The average concentration of ethyl acetate was evaluated for each air pollutant monitor over the span of this study. The results for each monitor are displayed in the table below. The calculated hazard quotient is well below 1.0 at all monitors, which indicates that the measured concentrations of ethyl acetate do not present a risk for non-cancer health effects.

Table 1. Ethyl Acetate Hazard Quotients (concentrations expressed in micrograms per cubic meter)

Monitor	Years	Average Concentration	Reference Concentration (RfC)*	Hazard Quotient
East Chicago Water Filtration Plant	2006-2012	0.50	125.00	0.004
East Chicago Marina	2013-2015	0.44	125.00	0.004
Gary IITRI	2006-2015	0.32	125.00	0.003
Hammond CAAP	2006-2015	0.45	125.00	0.004
Whiting High School	2006-2015	0.40	125.00	0.003

Ogden Dunes – Diana Rd	2006-2015	0.23	125.00	0.002
Lafayette Cinergy	2008-2012	0.24	125.00	0.002
Terre Haute – Fort Harrison Rd	2014-2015	0.15	125.00	0.001
Indianapolis – Washington Park	2006-2015	0.26	125.00	0.002
University of Evansville	2006-2015	0.27	125.00	0.002
Clarksville – Falls of the Ohio	2008-2015	0.73	125.00	0.006

* Reference Concentration Source: American Conference of Industrial Hygienists (ACGIH)

Cancer Risk

There is no evidence of increased cancer risk from exposure to ethyl acetate.