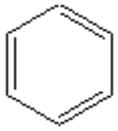
ALASKA TOP TEN HAZARDOUS AIR POLLUTANTS

#3	BENZENE	

Inventory Estimates

Community	Ranking by Mass	Total Emitted (tons per year)	Top Sources
Anchorage	3 of 71	186	Mobile sources: motor vehicles
Fairbanks	4 of 58	107	Mobile sources: motor vehicles
Juneau	3 of 52	77	Mobile and nonroad sources: aircraft, logging equipment, outboards
Total of 3 Communities		370	

Benzene Sources

vehicles	painting activities	power generators
boats and ships	aircraft	airports
locomotives	wastewater facilities	asphalt plants and paving
off-road equipment like construction equipment and chainsaws	military bases	hospitals
wood stoves	incinerators	service stations
refineries and bulk terminals	consumer products like automotive care and sealant products	

Potential Occupational Exposure to Benzene

use of motor fuels	solvent for fats, waxes, resins, oils, inks, paints, plastics, and rubber	extraction of oils from seeds and nuts
photogravure printing	detergents manufacture	explosives production
pharmaceutical manufacture	dyestuff manufacture	

Benzene Emission Inventory Improvements

- Measure activity levels for marine sources, especially in Juneau
- Refine non-road sources such as chainsaws
- Refine off-road assessments such as locomotives if possible
- Refine evaporative emissions from fuel storage, loading and dispensation
- Benzene not included in some diesel fired boilers, heaters, and turbines sources

Benzene Health Effects

Low level (<50 ppm): Chromosomal alterations for 8 hr exposures at 2-3 ppm for up to 24 years. Evidence of low white and red blood cell counts. Evidence of increased deaths from suicide, leukemia and other cancers with 2-25 ppm 8 hour exposures over 33 years. Odor threshold around 1.5ppm Reported symptoms of dizziness, sore throat, and headache for occupationally exposed (33-60 ppm TWA over 7 hours/day).

High level(50-10000): Significant increase in acute leukemia after mean 3-14 years exposure to 200-700 ppm. Significant increase in lung cancer. Life threatening at 7500 ppm. 1500 ppm for an hour produces symptoms such as short term memory, drowsiness, dizziness, headaches, unconsciousness.

Very High level(>10000 ppm): Fatal within 20 minutes.

NOTE: Smokers exhale nearly 10 times the amount of benzene that non-smokers.

Cancer ranking: The EPA classifies benzene as a Group A carcinogen for lung cancer. Group A carcinogens are considered known human carcinogen, like cigarette smoke. There is a 2.2×10^{-6} to 7.8×10^{-6} increase in lifetime risk of leukemia for every one $\mu g/m^3$ of benzene lifetime exposure.