

REACH Mon Valley Bucket Air Sampling Results

Compound Detected	Sample #104 10-26-04 Elizabeth	Sample #101 2-6-05 W. Elizabeth	Sample #102 4-6-05 W. Elizabeth	Sample #103 10-12-05 Clairton
Acrylonitrile		33.0		
Benzene	21.0	13.0		91.0
n-Butane*		10.0	10.0	20.0
C ₅ H ₁₀ Branched Alkane*				30.0
C ₁₃ H ₂₈ Branched Alkane*	20.0			
Carbon Disulfide	8.9			
Chlorodifluoromethane+Propane+Propene +Carbonyl Sulfide*	10.0			
Cyclohexane*	20.0			
Decanal*	10.0	40.0		
n-Decane*	30.0	100.0		
2,2-Dimethylbutane*				30.0
2,3-Dimethylbutane*				30.0
2,3-Dimethylpentane*				20.0
n-Dodecane*		50.0		
Ethanol		42.0		
2-Ethyl-1-hexanol*	10.0	50.0		
Ethylbenzene		24.0		24.0
4-Ethyltoluene				8.4
n-Heptane*				30.0
n-Hexane				51.0
Hexamethylcyclotrisiloxane (<i>possible artifact</i>)*	50.0			
Hydrogen Sulfide	13.8			
Isooctane*				30.0
Isopentane*	20.0	20.0		
d-Limonene		7.3		
Longifolene*	10.0			
Methylcyclopentane + 2,4-Dimethylpentane*				30.0
3-Methylheptane*				20.0
2-Methylhexane*				40.0
3-Methylhexane*				40.0
2-Methylpentane*				90.0
3-Methylpentane*				60.0
Nonanal*		30.0		
Nonane				8.1
Octanal*		20.0		
n-Octane*	40.0			
n-Pentane*		20.0		80.0
alpha-Pinene		7.0		
beta-Pinene*		10.0		
Propane + Propene*		20.0	20.0	
1-Propanol*	40.0			
2-Propanol (Isopropyl Alcohol)				12.0
Unidentified Siloxane (<i>possible artifact</i>)*	20.0			
Styrene		8.2		
Toluene	36.0	130.0	5.6	130.0
1,2,4-Trimethylbenzene		9.6		27.0
1,3,5-Trimethylbenzene				9.4
Unidentified Compound*		10.0		
<i>m,p</i> -Xylenes	8.5	45.0		95.0
<i>o</i> -Xylene		23.0		35.0

* Tentatively identified compounds. Results approximate.

Notes: All figures in this chart measured in µg/m³ (micrograms per cubic meter).

All samples were analyzed for 67 VOC compounds using EPA Method TO-15 and for sulfur compounds using ASTM D 5504-01, with the exception of the 2-6-04 sample that was only analyzed using EPA Method TO-15. Library scans were performed on all samples to tentatively identify other compounds present.

**REACH Mon Valley Bucket Air Sampling Results
Health Effects of Detected Compounds**

Compound	Nasal/Throat Irritant	Eye Irritant	Skin Irritant	Respiratory Irritant	Neurotoxic Effects	Birth Defects	Reproductive/Develpmntal Effects	Carcinogen	Blood Disorders	Liver/Kidney Damage
Acrylonitrile	Y	Y		Y	Y	Possible	Possible	Y		Y
Benzene		Y	Y	Y	Y	unk	Y	Y	Y	
Butane					Y	unk	unk	unk		
Carbon Disulfide	Y	Y		Y	Y	Y	Y	unk		Y
Decane	Y			Y	Y	unk	unk	unk		
Ethanol	Y	Y	Y		Y					
Ethylbenzene	Y	Y		Y	Y			unk	Y	Y
n-Hexane	Y	Y	Y		Y	unk	unk	unk		
Hydrogen Sulfide	Y	Y		Y	Y	N	N	unk		
Limonene	Y	Y	Y	Y	Y					Y
Octane	Y	Y	Y	Y	Y	unk	unk	unk		
Pentane	Y			Y	Y	unk	unk	unk		
Pinene	Y	Y	Y	Y	Y					Y
Propane					Y	unk	unk	unk		
2-Propanol (Isopropyl Alcohol)	Y				Y	N	N	unk		
Styrene	Y	Y			Y	Possible	Possible	Possible		
Toluene	Y	Y	Y	Y	Y	Y	Possible	unk		Y
Trimethylbenzenes	Y	Y	Y	Y	Y	unk	unk	unk	Y	Y
Xylenes	Y	Y		<i>Y-esp. w/toluene</i>	Y	unk	Y	unk	Possible	Y

* *unk=unknown; chemical has not yet been tested for this health effect*

* **Sources:** US Environmental Protection Agency and New Jersey Department of Health

REACH Mon Valley Bucket Air Sampling Results
Health Effects of Detected Compounds

Compound	Sample Number	Highest Level Detected	EPA Region 3 Risk-Based Concentrations	Texas Short-Term Effects Screening Level	Texas Long-Term Effects Screening Level	North Carolina Annual Ambient Air Standard
Acrylonitrile	101	33.0	0.03	43.0	4.3	0.15
Benzene	103	91.0	0.23	12.0	3.0	0.12
n-Butane	103	20.0		19,000.0	1,900.0	
Carbon Disulfide	104	8.9	730.0	30.0	3.0	
Ethanol	101	42.0		18,000.0	1,880.0	
Ethylbenzene	101 & 103	24.0	1.6	2,000.0	200.0	
n-Heptane	103	30.0		3,500.0	350.0	
n-Hexane	103	51.0	210.0	1,760.0	176.0	
Hydrogen Sulfide	104	13.8	2.1	1.0		
Isooctane	103	30.0		3,500.0	350.0	
n-Pentane	103	80.0		3,500.0	350.0	
2-Propanol (Isopropyl Alcohol)	103	12.0		7,850.0	785.0	
Styrene	101	8.2	1,000.0	110.0	11.0	
Toluene	101 & 103	130.0	420.0	1,880.0	188.0	
1,2,4-Trimethylbenzene	103	27.0	6.2	1,250.0	125.0	
1,3,5-Trimethylbenzene	103	9.4	6.2	1,250.0	125.0	
<i>m,p</i> -Xylenes	103	95.0	7,300.0	3,700.0	370.0	
<i>o</i> -Xylene	103	35.0	7,300.0	3,700.0	370.0	

* All figures in this chart measured in $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter).

* Chemicals in bold exceeded one or more of the standards.

Explanation of Screening Levels and Ambient Air Standards

EPA Region 3 Risk-Based Concentrations:

- Developed by EPA staff to assist in risk assessments, especially for Superfund sites.
- Levels are based on best available health effects studies, including EPA IRIS database.
- Levels are set for a one in a million cancer risk, or for an equivalent non-cancer risk (hazard quotient = 1)

Texas Long-Term Effects Screening Levels:

- Based on existing studies of chemical health effects during an exposure period of *one year*, in most cases. For *benzene* and *ethylene dichloride* it indicates a *24-hour* exposure period. Below these levels, no adverse health effects are thought likely to occur.
- Reflect the experimentally-determined levels at which the chemicals caused adverse effects in study populations of people or animals, combined with safety factors to account for the differences among human populations and between humans and animals.
- Not legally enforceable.

Texas Short-Term Effects Screening Levels:

- Based on existing studies of chemical health effects during an exposure period of *one hour*. Below these levels, no adverse health effects are thought likely to occur.
- Reflect the experimentally-determined levels at which the chemicals caused adverse effects in study populations of people or animals, combined with safety factors to account for the differences among human populations and between humans and animals.
- Not legally enforceable.

North Carolina Annual Ambient Air Standards:

- Legally enforceable standards in North Carolina, developed through North Carolina's regulatory process.
- Based on health effects about the chemicals.