

# Toxics Air Monitoring

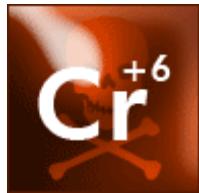
PQAO Training Module 3

July 28, 2015

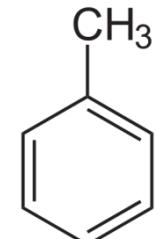
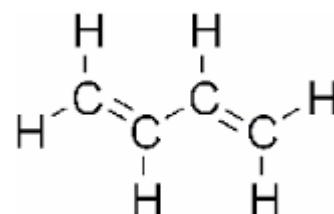
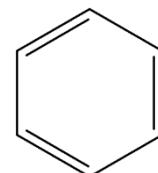
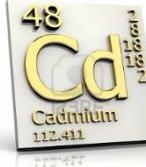
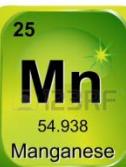
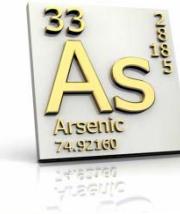
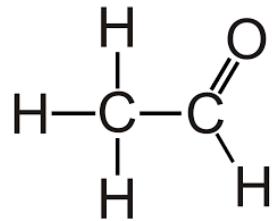
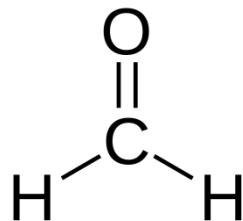
Kathy Gill

# Toxic Air Contaminants Monitoring

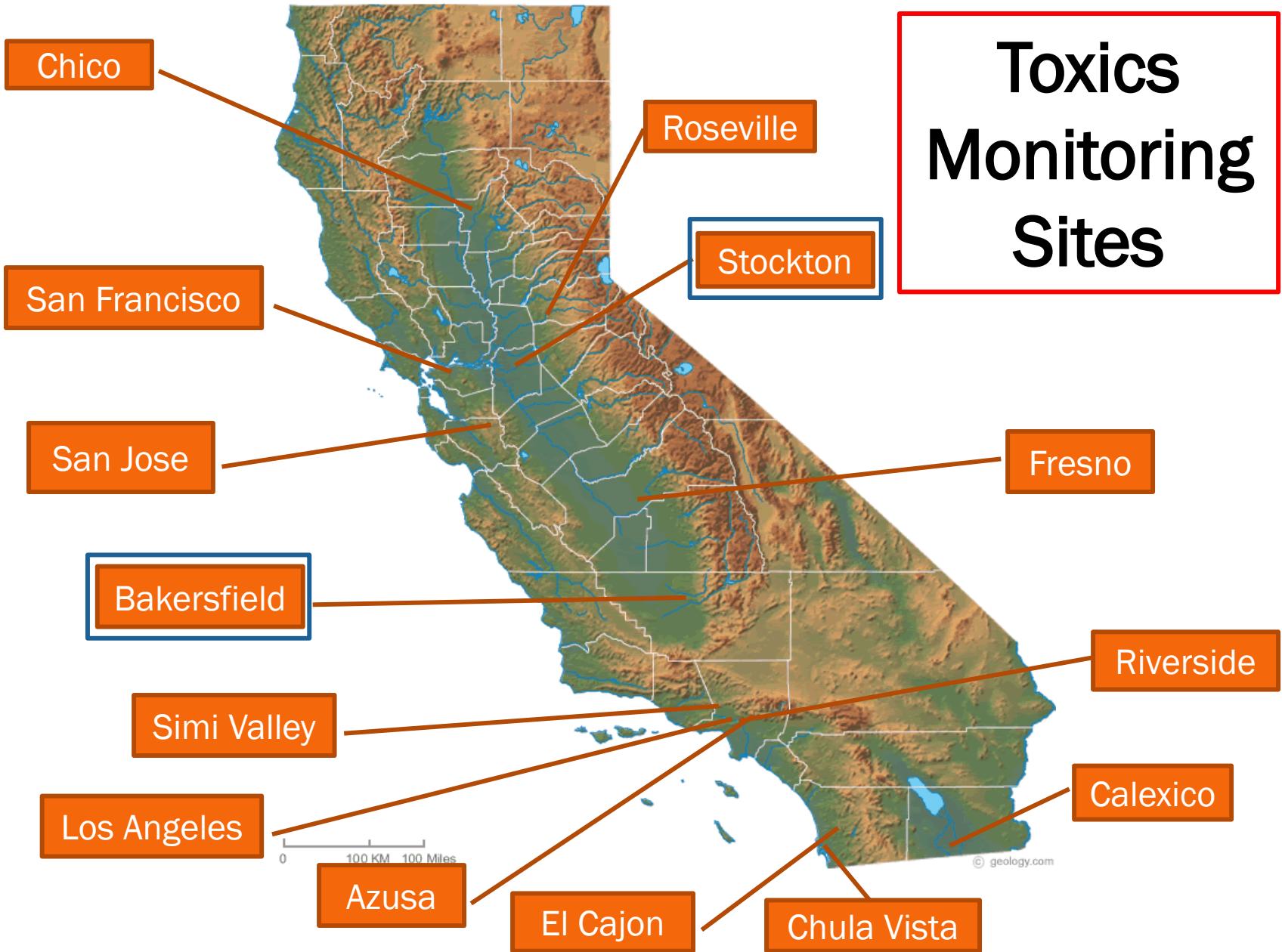
## Hexavalent Chromium



## Carbonyl Compounds



# Toxics Monitoring Sites



# Toxics Sampling Schedule

**January**

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

**February**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

**March**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

**April**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

**May**

S	M	T	W	T	F	S
			1	2		
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

**June**

S	M	T	W	T	F	S
		1	2	3	4	5
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

**July**

S	M	T	W	T	F	S
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

**August**

S	M	T	W	T	F	S
			1			
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

**September**

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

**October**

S	M	T	W	T	F	S
		1	2	3	4	5
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

**November**

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

**December**

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

# Laboratory Quality Control

## ∞ Presampling

- Filter inspections
- Canister cleaning
- Lot blanks

# Canister Cleaning



# Canister Handling



Dent from  
bouncing  
canister

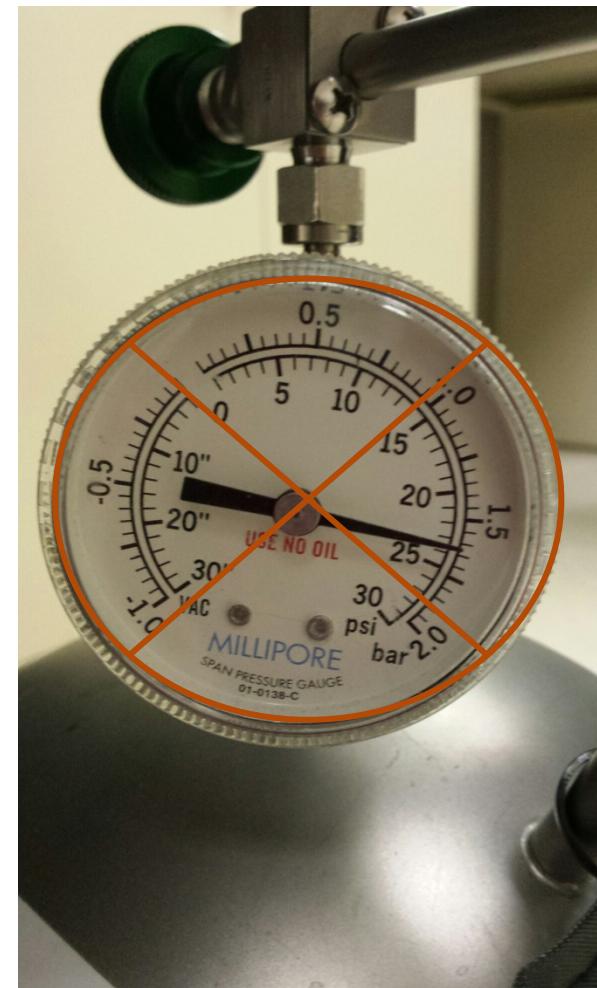


This is NOT repairable.

# Laboratory Quality Control (cont.)

## Post sampling

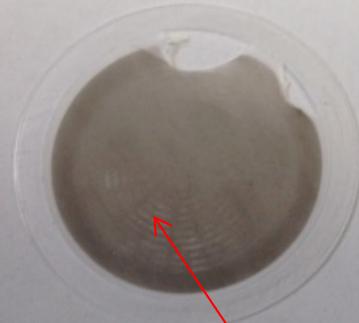
- Sample inspections



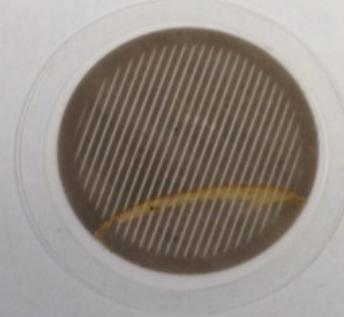
# Filters

Invalid filters

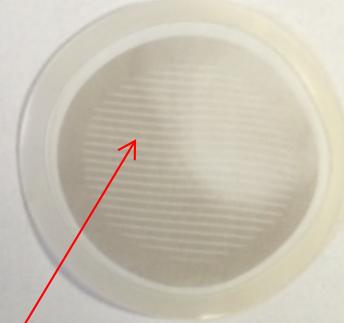
Holes



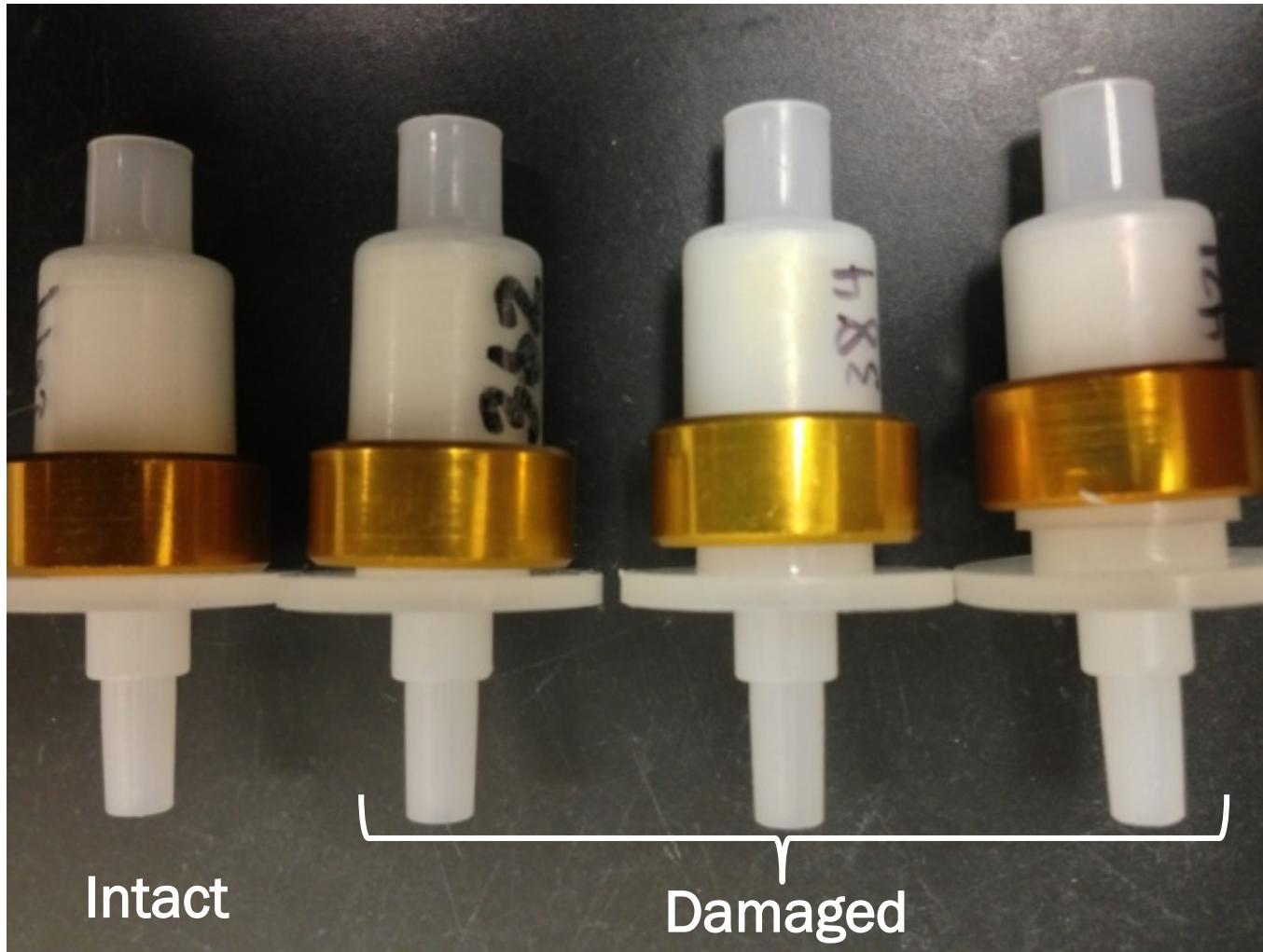
Streak



Fingerprints



# Carbonyl Cartridges

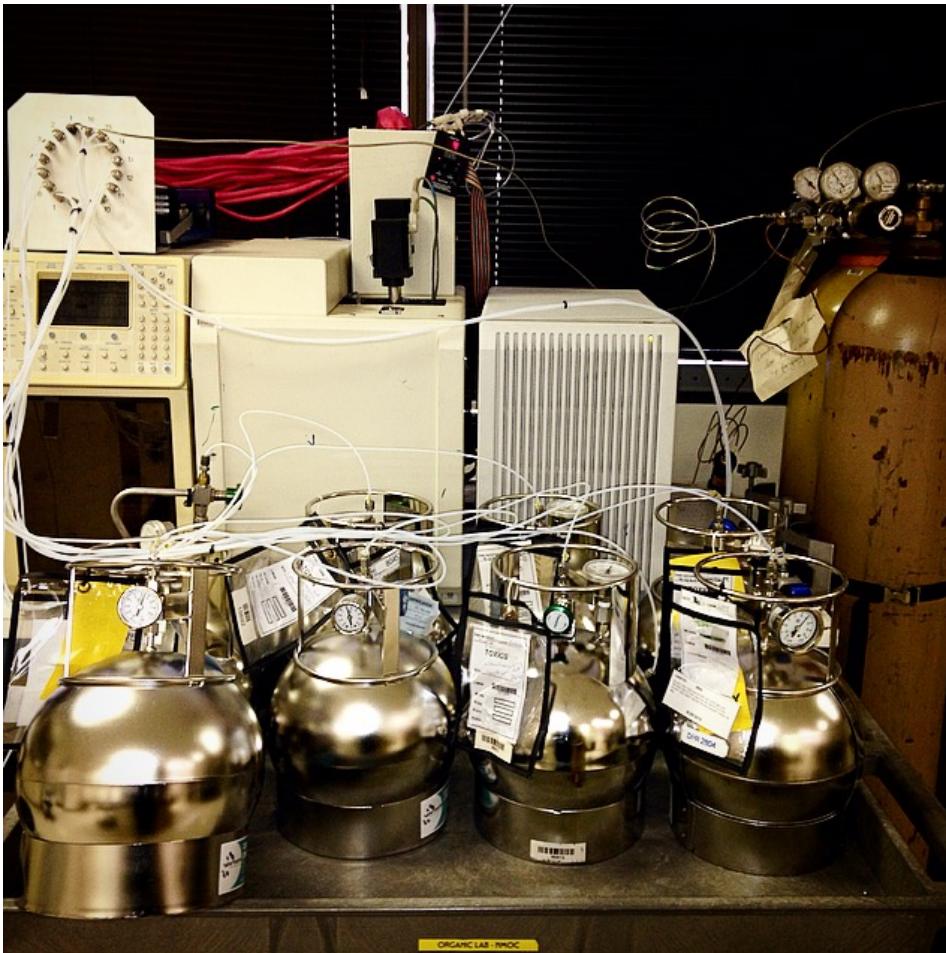


# Laboratory Quality Control (cont.)

## ❖ Post sampling

- Sample inspections
- Field Datasheet review
- Blanks – trip, field, extraction, solvent
- Calibration samples
- Control samples
- Spikes

# Laboratory Analyses



GC-MS Canister Analysis for  
Volatile Organic Compounds (VOC) and Greenhouse Gases (GHG)

# Metals



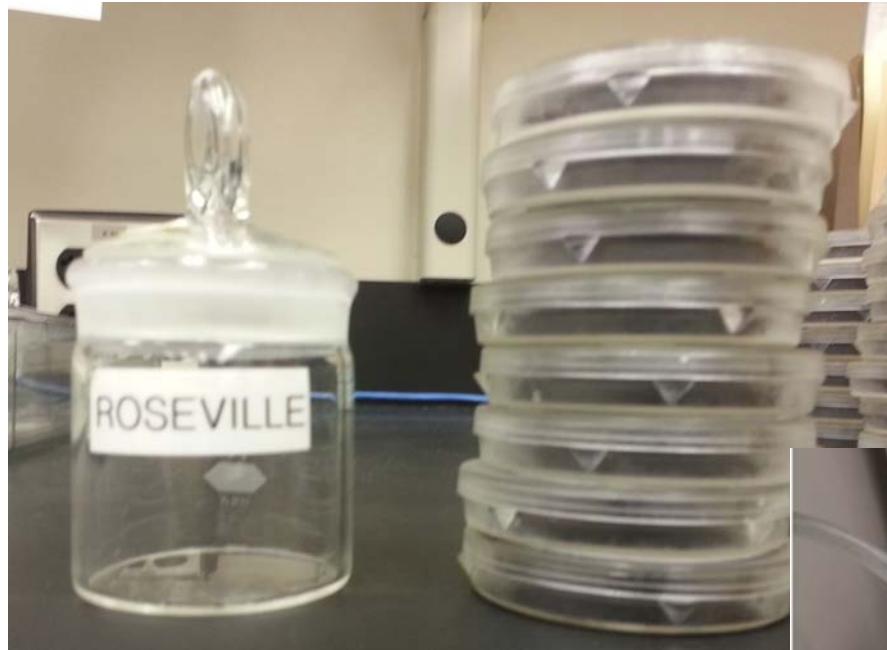
# Inductively Coupled Plasma - Mass Spectrometer



ICP-MS

Autosampler

# Hexavalent Chromium

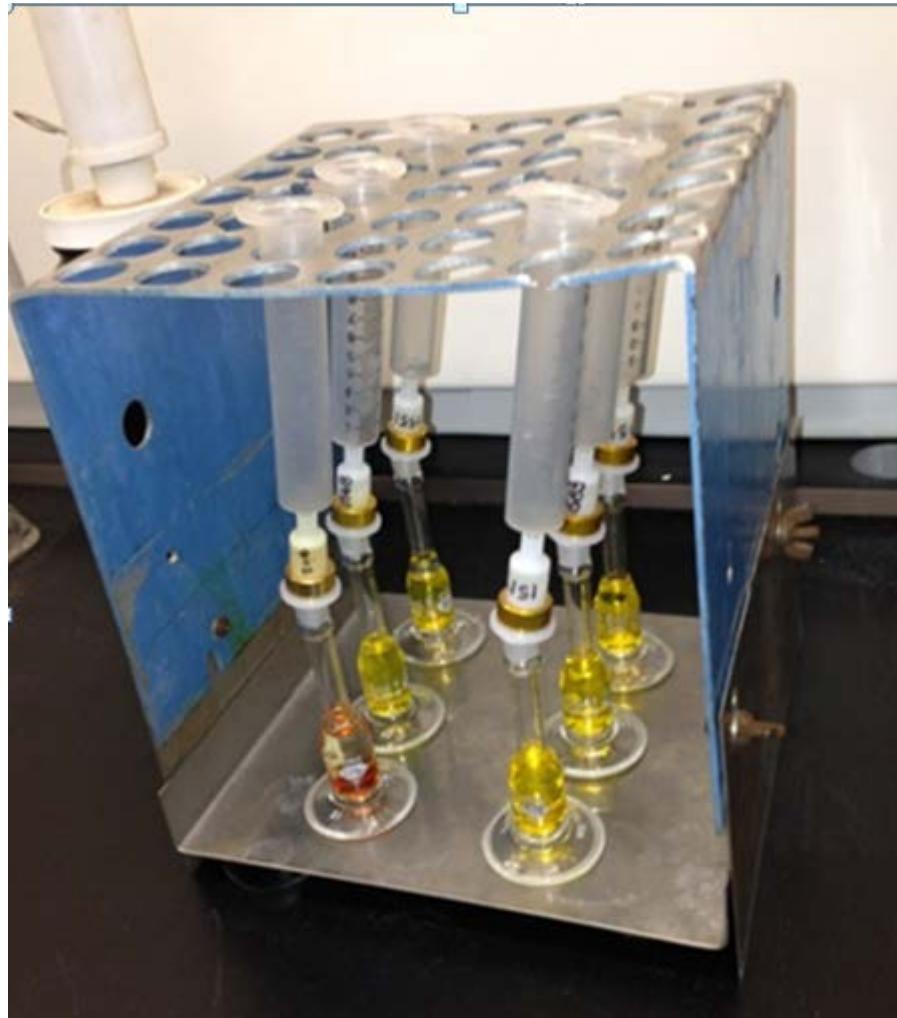


Hexavalent Chromium

# Ion Chromatography System



# Carbonyls



# High Performance Liquid Chromatography System



# Laboratory Quality Control (cont.)

## ❖ Canister Criteria

- No more than 60 days from cleaning to sampling
- No more than 30 days from sampling to analysis
- Pressure between 10 and 16 psig after sampling

## ❖ Filter Criteria

- Metals – retrieve from sampler within 48 hours, refrigerate  
Ship to lab on ice within 5 days
- Hex Chrome – same as metals  
Extract and analyze on same day

## ❖ Carbonyl Criteria

- Same as metals
- 14 day shelf life for cartridge at ambient temp, 6 months refrigerated
- No more than 14 days from sampling to extraction
- No more than 7 days from extraction to analysis

# Laboratory Quality Control (cont.)

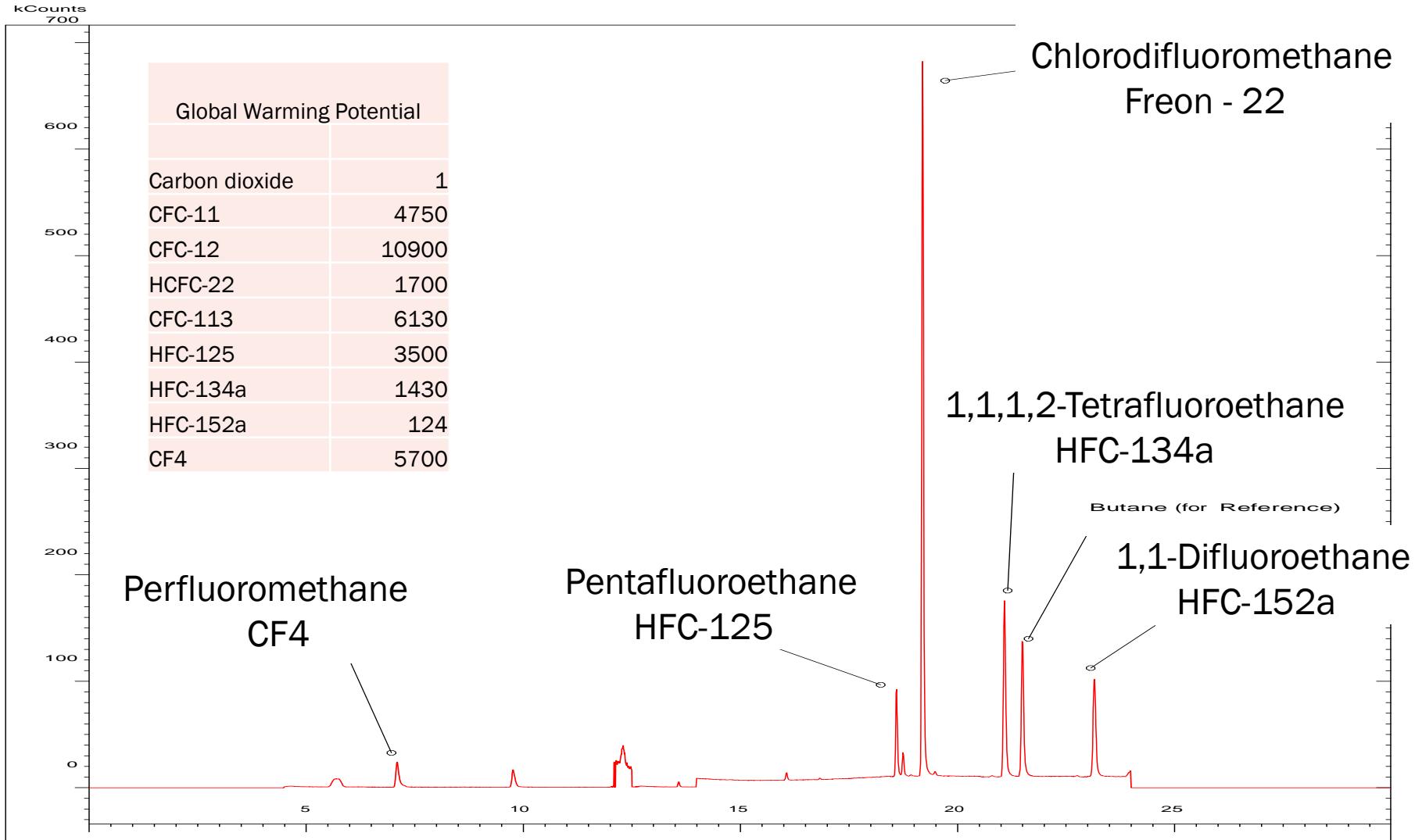
## ❖ Data Review

- Analyst
- Peer
- Manager
- Branch Chief

## ❖ Automated Review

- LIMS
- AQS

# Typical GHG Chromatogram



# Do you use this?



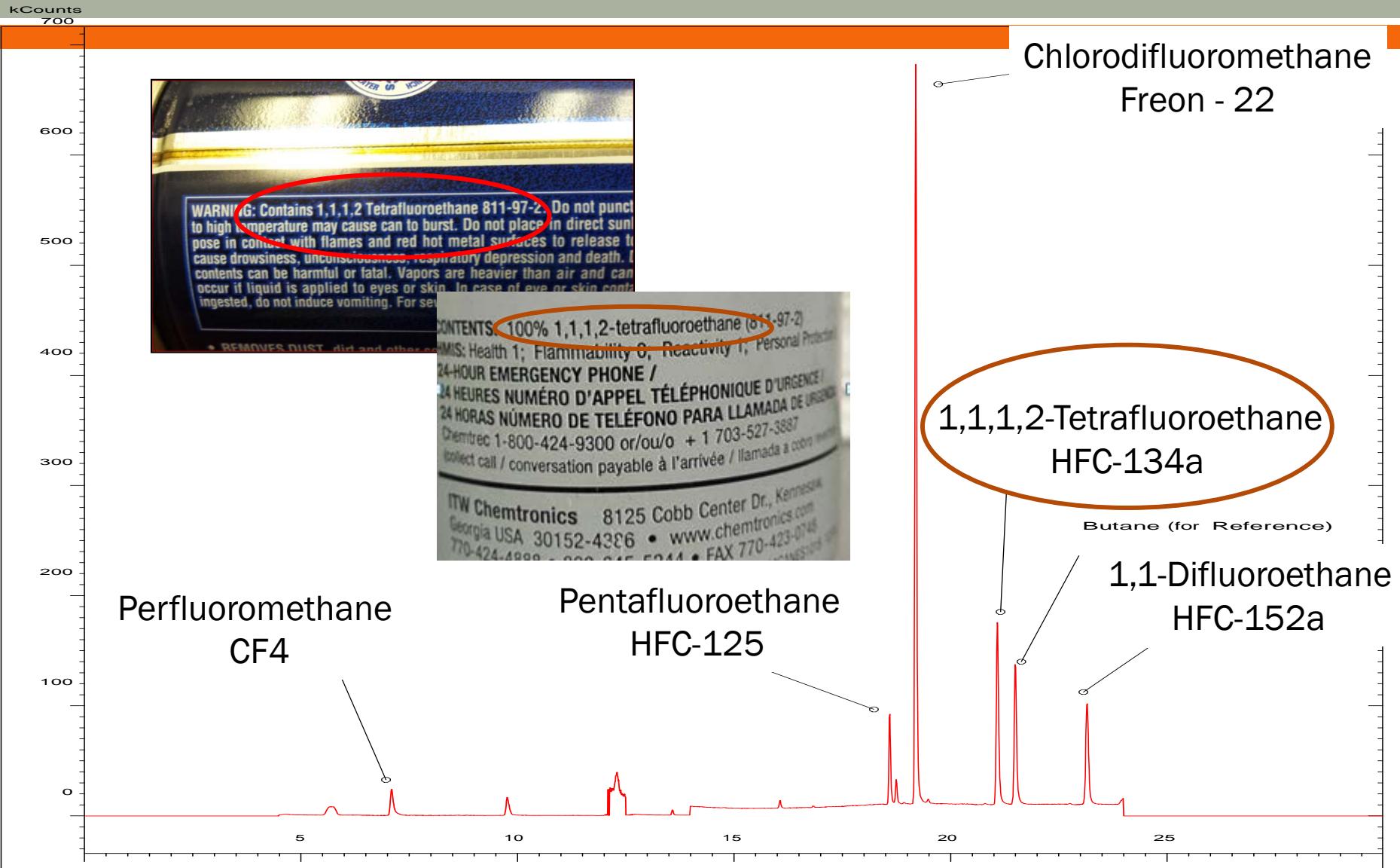
**WARNING.** Contains 1,1,1,2 Tetrafluoroethane 811-97-2. Do not punct  
to high temperature may cause can to burst. Do not place in direct sun  
pose in contact with flames and red hot metal surfaces to release to  
cause drowsiness, unconsciousness, respiratory depression and death. D  
contents can be harmful or fatal. Vapors are heavier than air and can  
occur if liquid is applied to eyes or skin. In case of eye or skin conta  
ingested, do not induce vomiting. For severe overexposure, call a physici

**KEEP AWAY FROM CHILDREN**

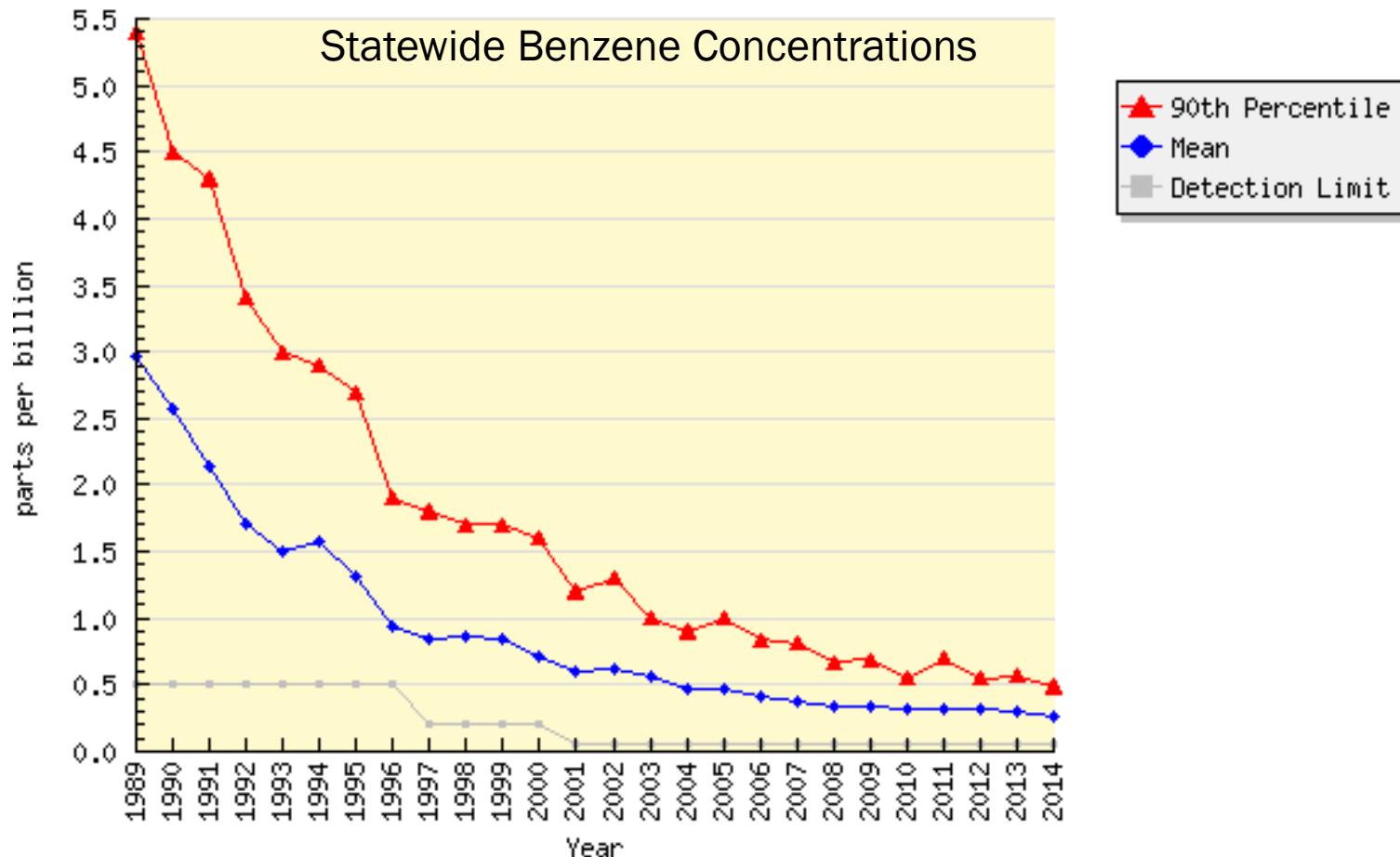
- REMOVES DUST, dirt and other contaminants that

DIREC

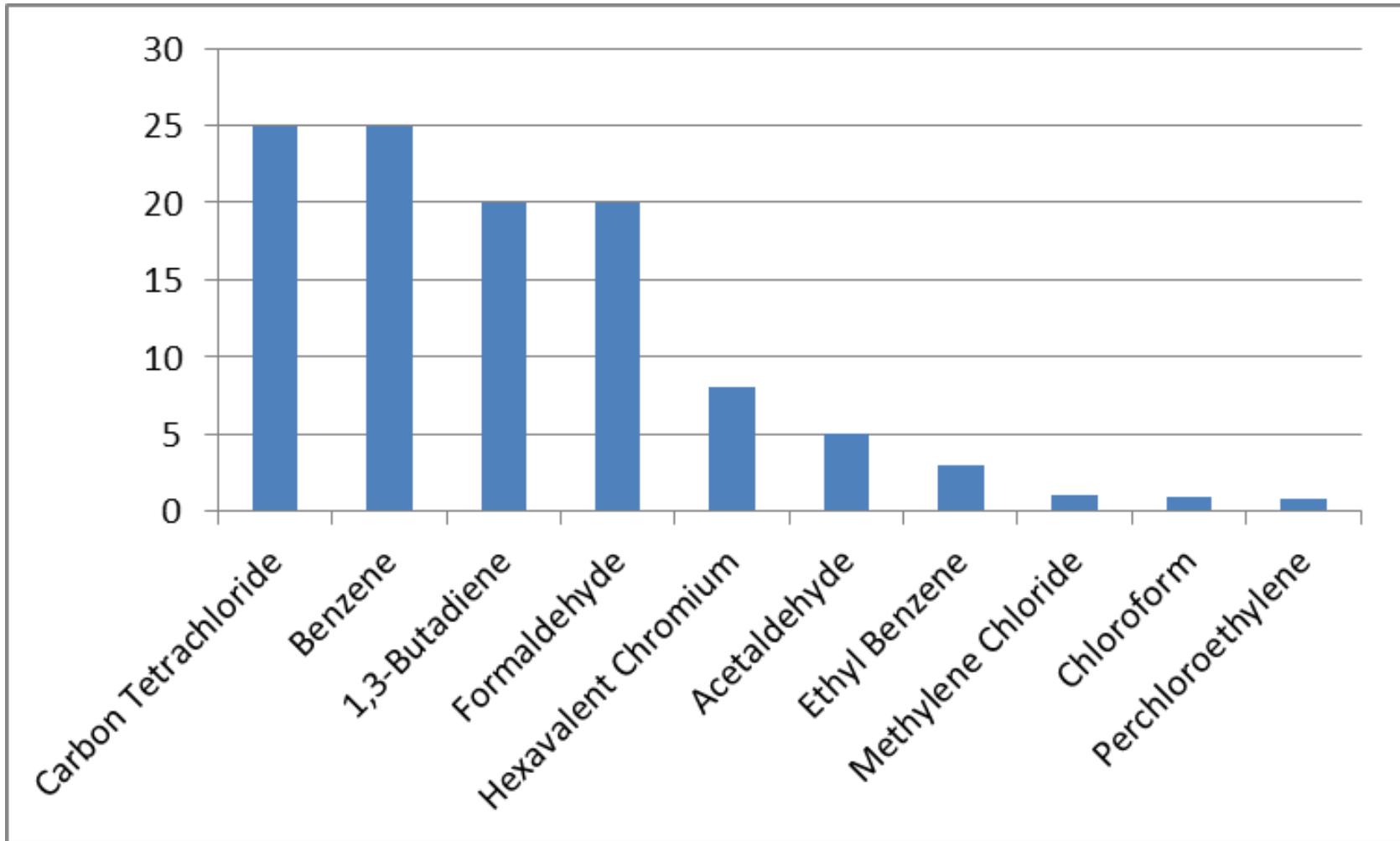
# Typical GHG Chromatogram



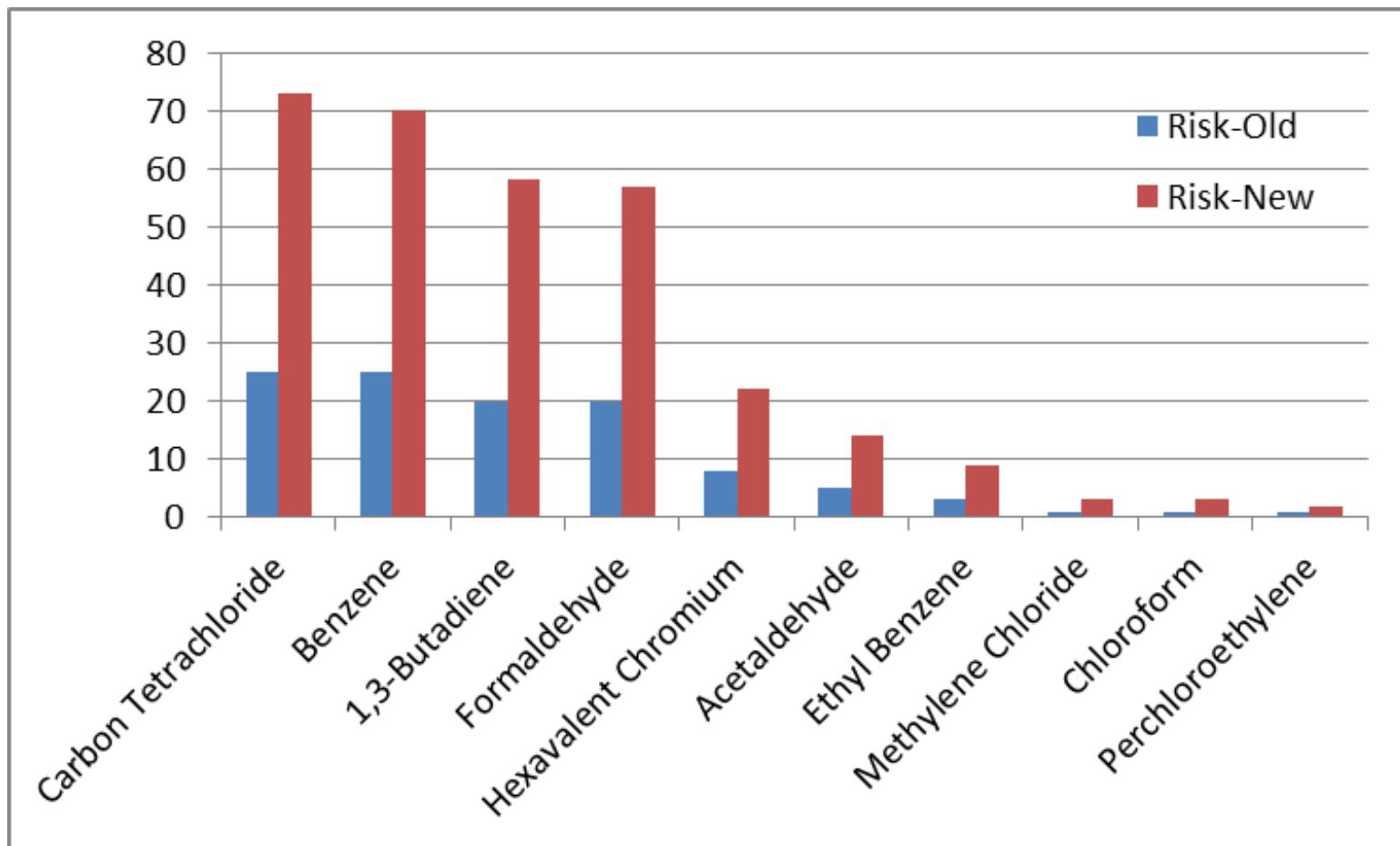
# Monitoring Trends



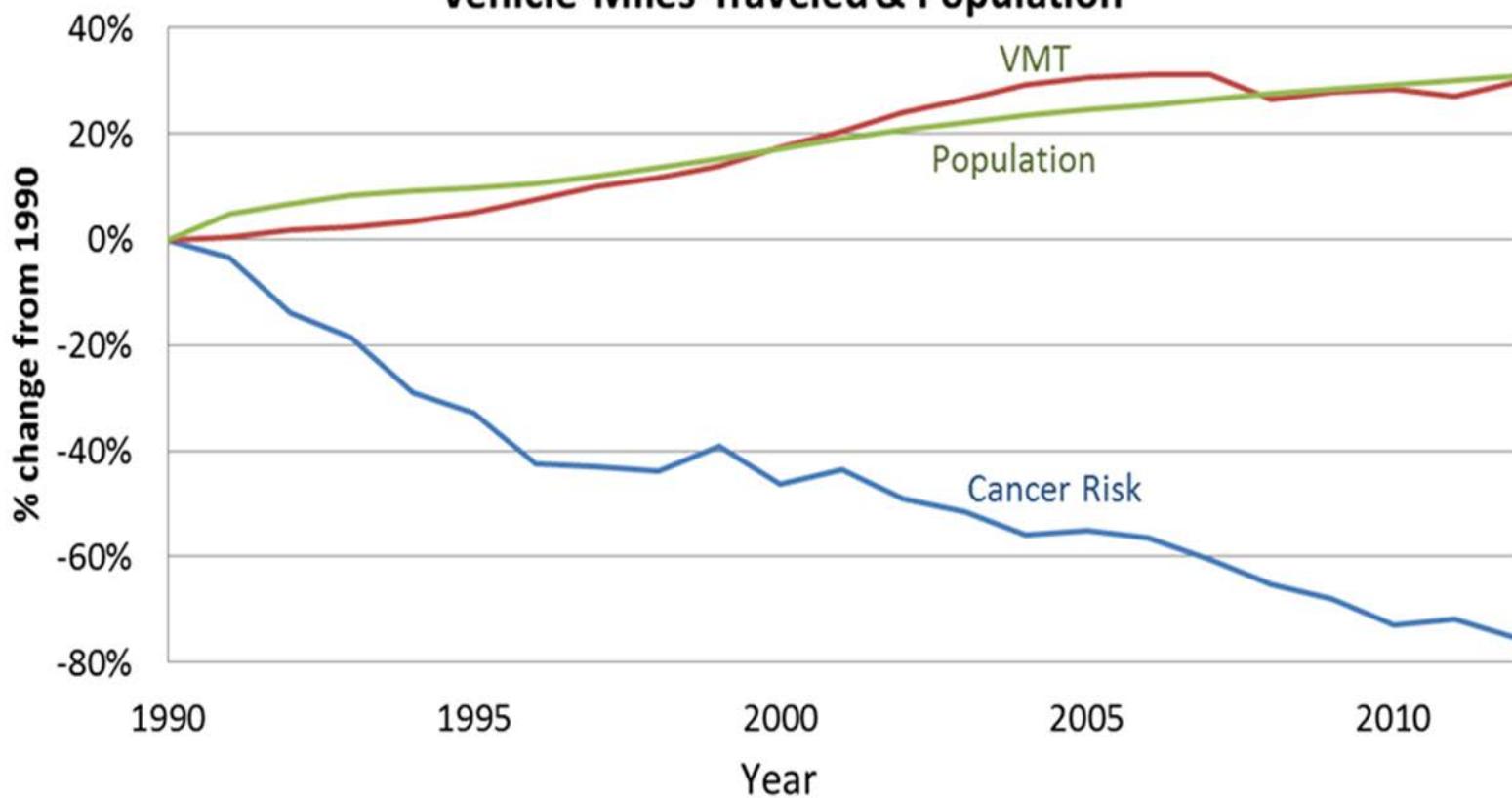
# Cancer Risk per Million



# Cancer Potency



### California % Change: Air Toxics Cancer Risk, Vehicle-Miles-Traveled & Population



# Questions?

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Monitoring and Laboratory Division  
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