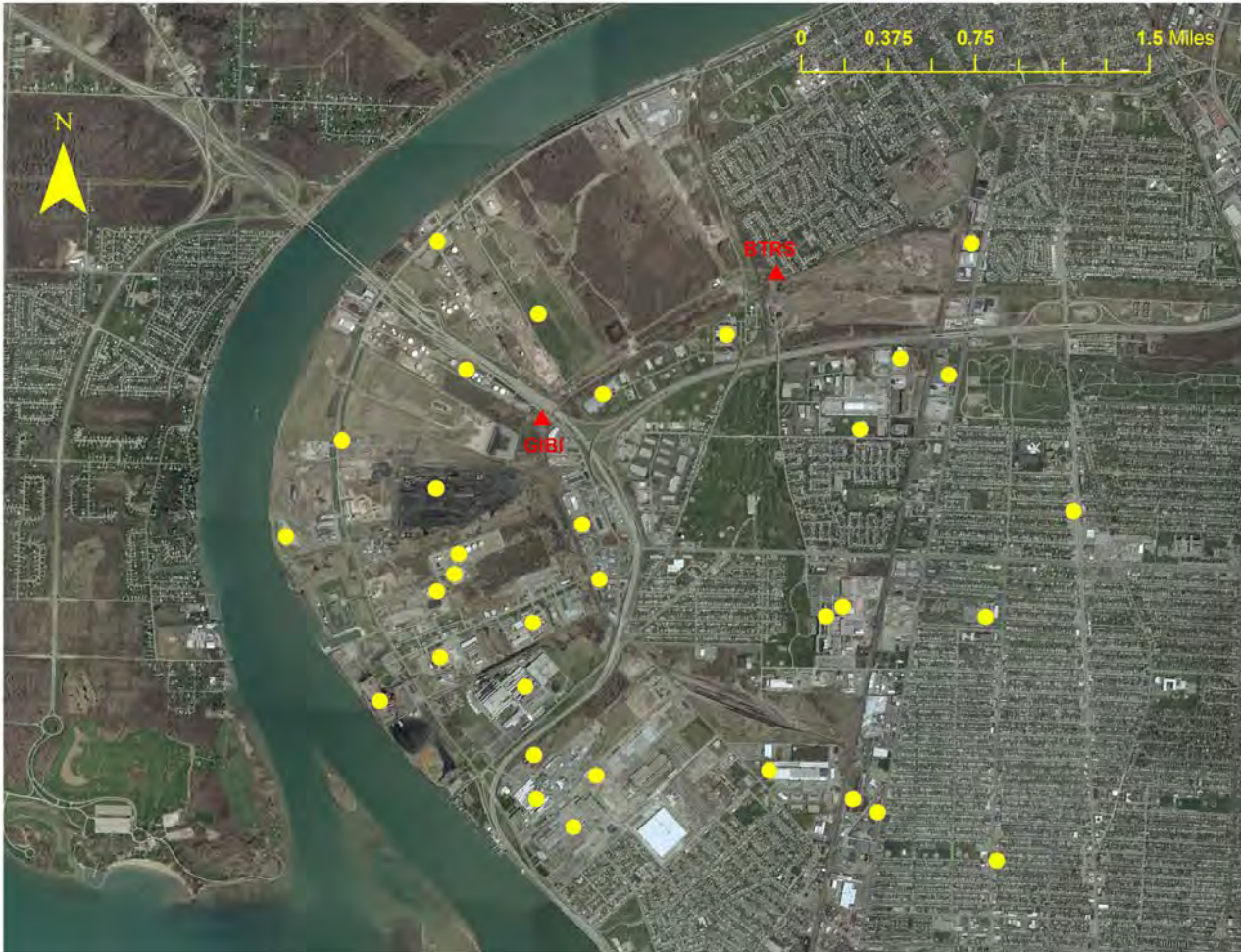




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Tonawanda Community Air Quality Study Update: An Evaluation of Eight Years of Post-Study Air Toxics Results

**Tonawanda Community Presentation
Division of Air Resources
December 6, 2016**



Grand Island Boulevard Industrial Site Monitor (GIBI)

Current Parameters Measured and Sampling Schedule

- Carbonyls (aldehydes) and air toxics (TO -15 volatile organic compounds) on a one and six day schedule.
- PM_{2.5} on a continuous hourly basis.
- Monitoring Station start date July 2007.



Brookside Terrace Residential Site Monitor (BTRS)

Current Parameters Measured and Sampling Schedule

- Carbonyls (aldehydes) and air toxics (TO -15 volatile organic compounds) on a one and six day schedule.
- PM_{2.5} on a continuous hourly basis.
- Sulfur Dioxide (SO₂) on a continuous hourly basis.
- Monitoring Station start date July 2007.



Air Toxics Monitoring Data Update

Volatile Organic Compounds

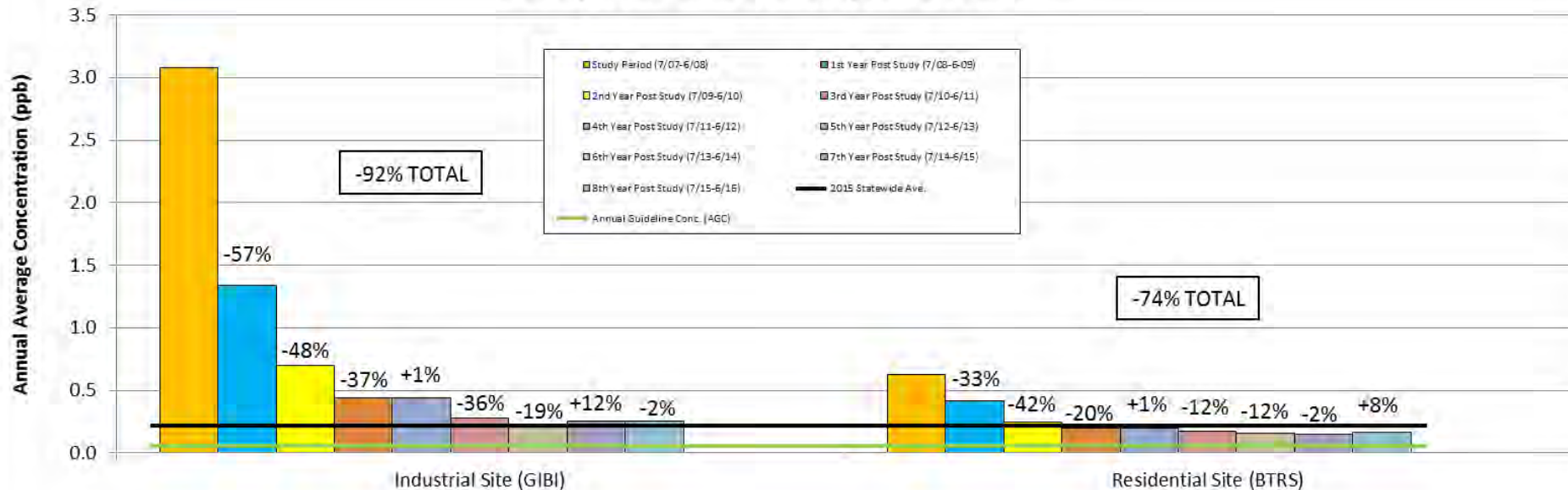
- Benzene
- Acrolein
- 1,3 - Butadiene

Carbonyls

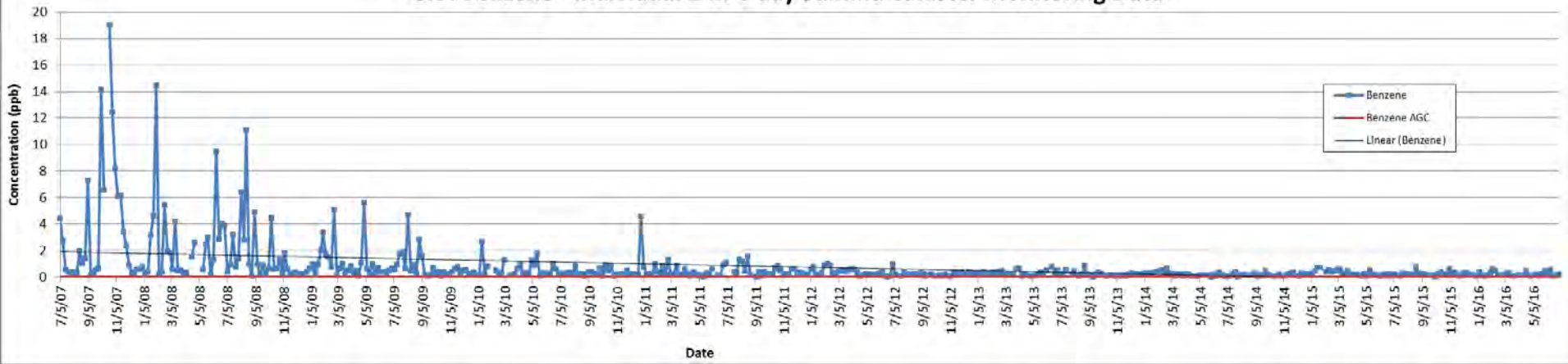
- Formaldehyde
- Acetaldehyde



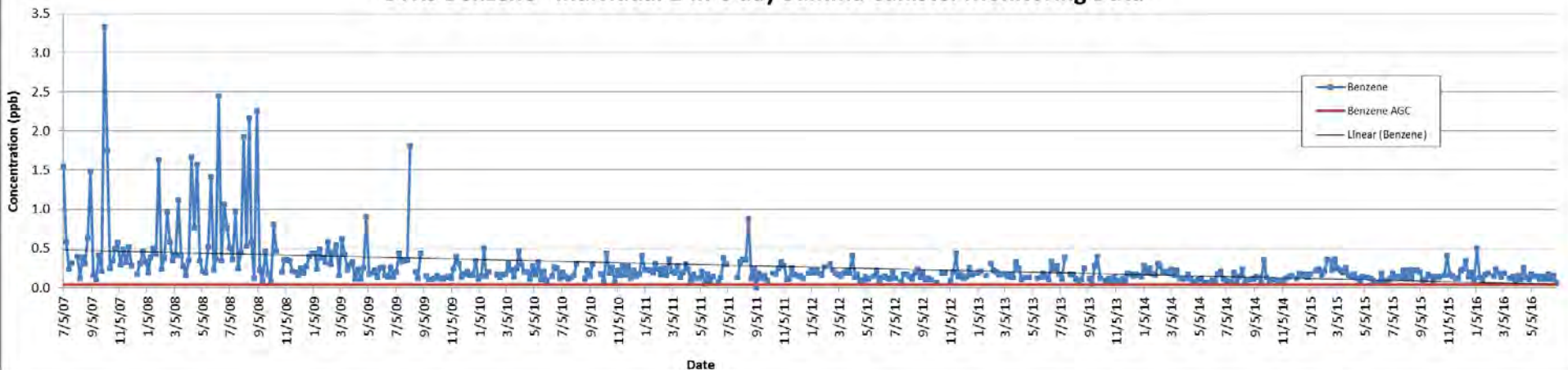
Benzene Concentration Study Year and Subsequent Years



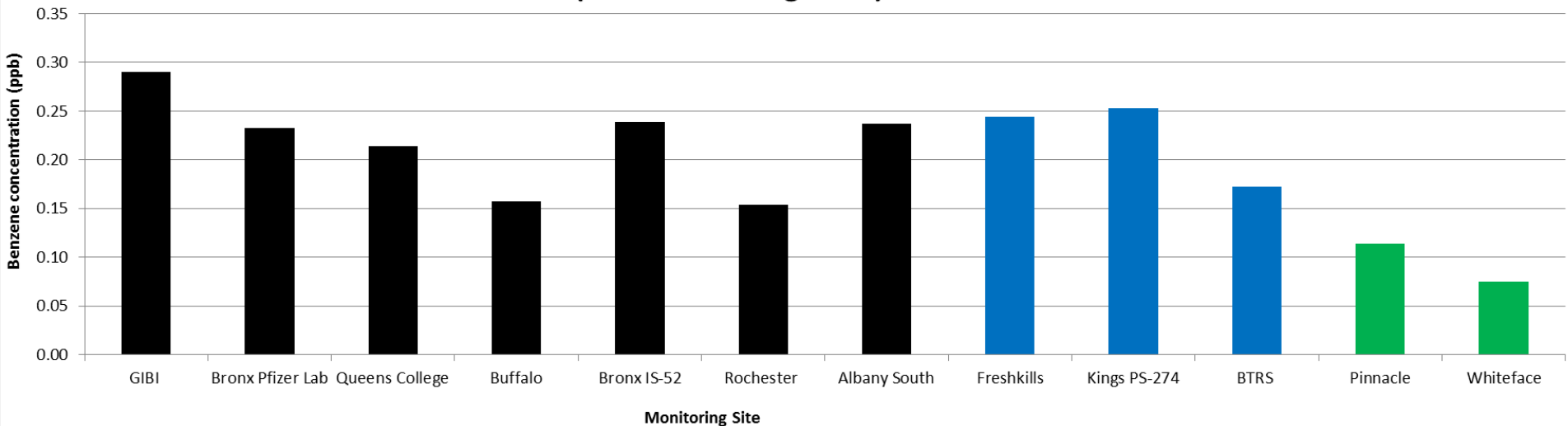
GIBI Benzene - Individual 1-in-6 day Summa Canister Monitoring Data



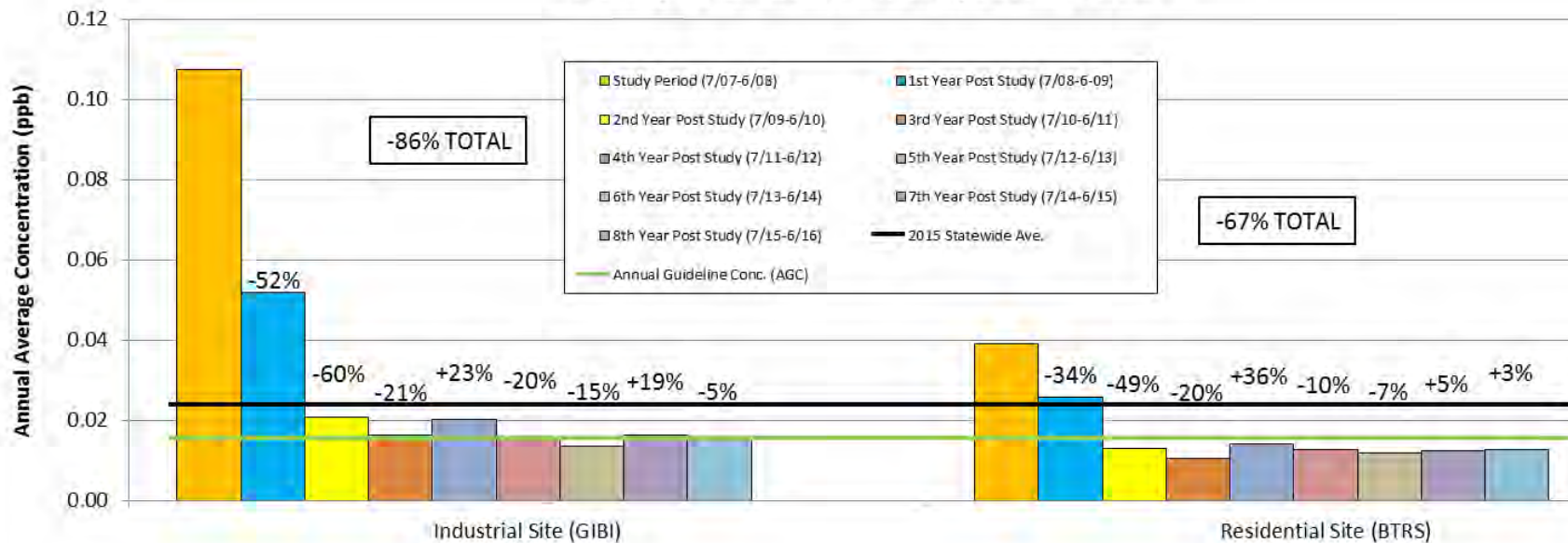
BTRS Benzene - Individual 1-in-6 day Summa Canister Monitoring Data



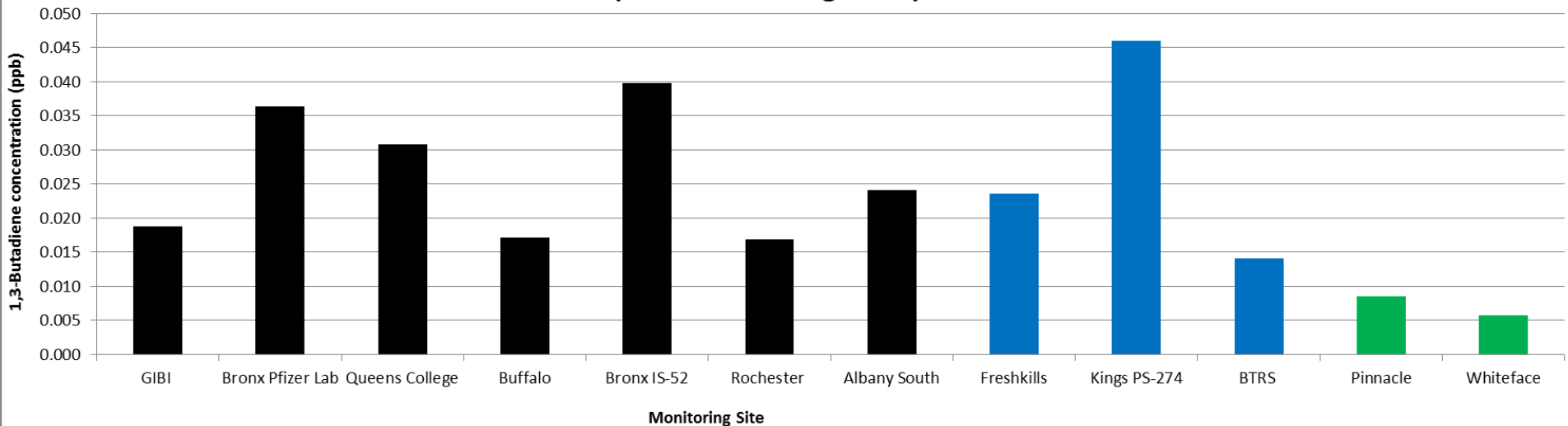
2015 Annual Average Benzene Concentrations at Statewide Sites (Location Setting Code)



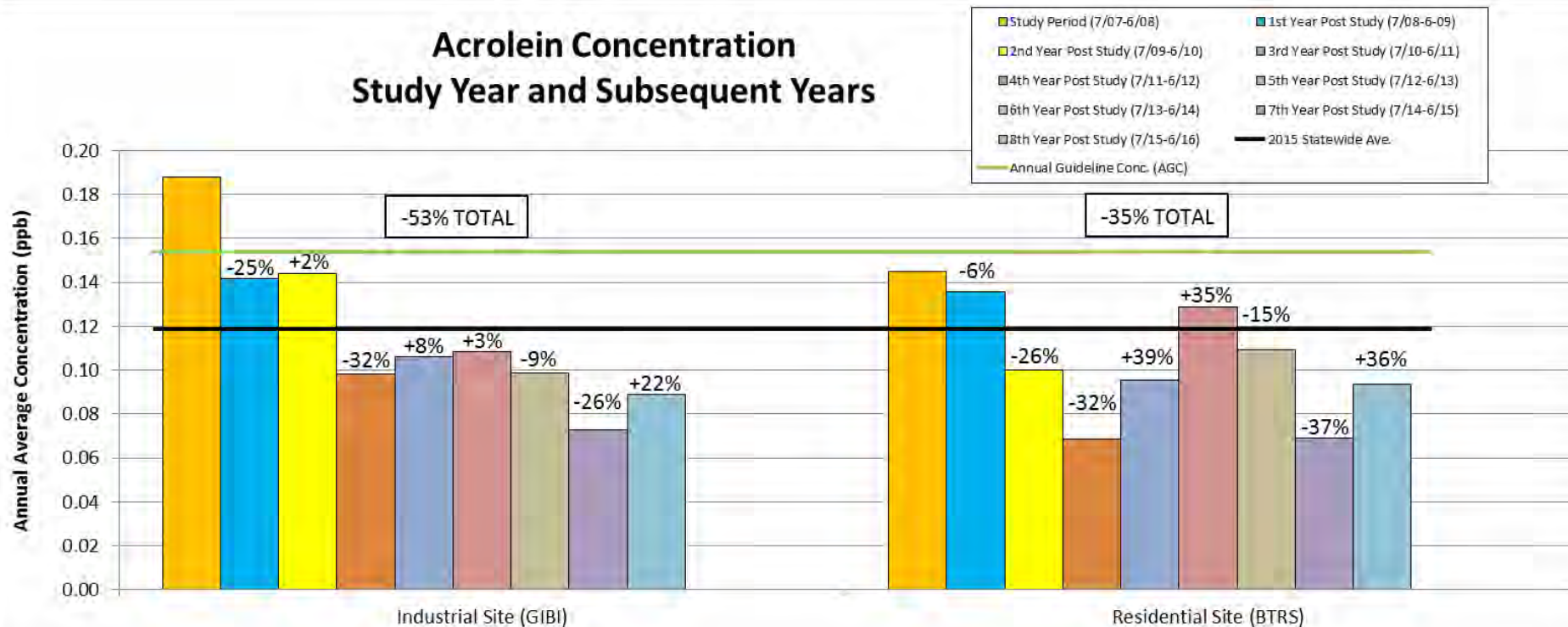
1,3-Butadiene Concentration Study Year and Subsequent Years

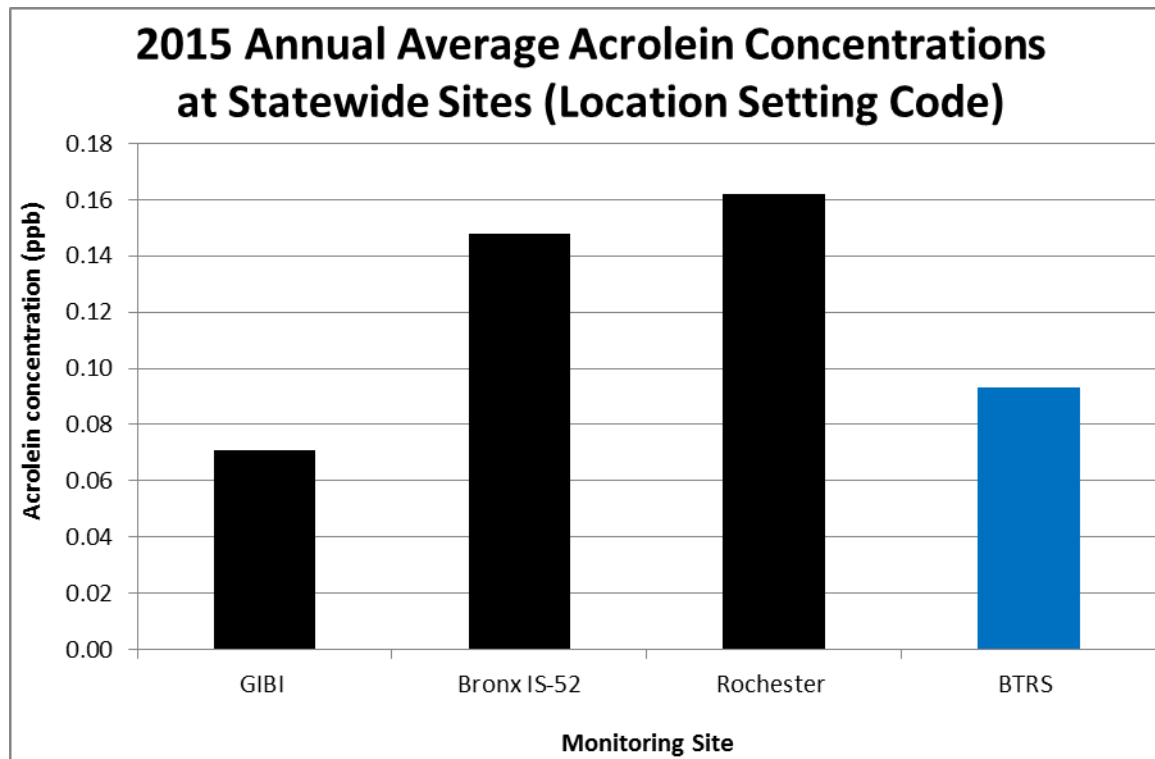


2015 Annual Average 1,3-Butadiene Concentrations at Statewide Sites (Location Setting Code)

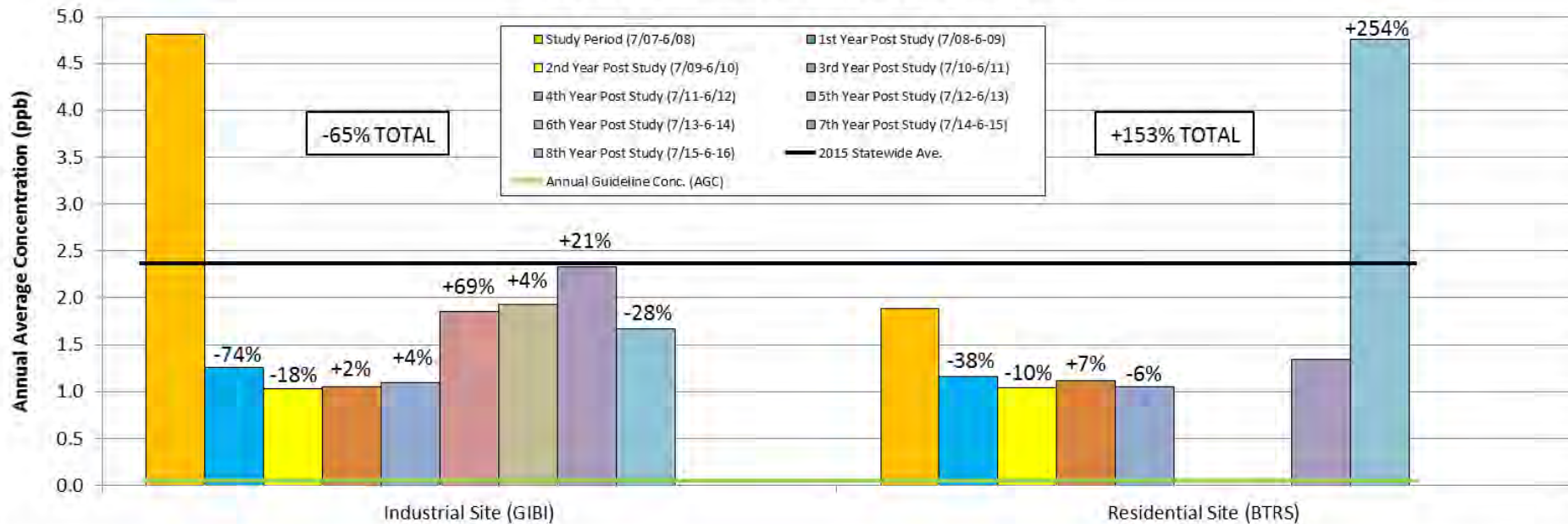


Acrolein Concentration Study Year and Subsequent Years

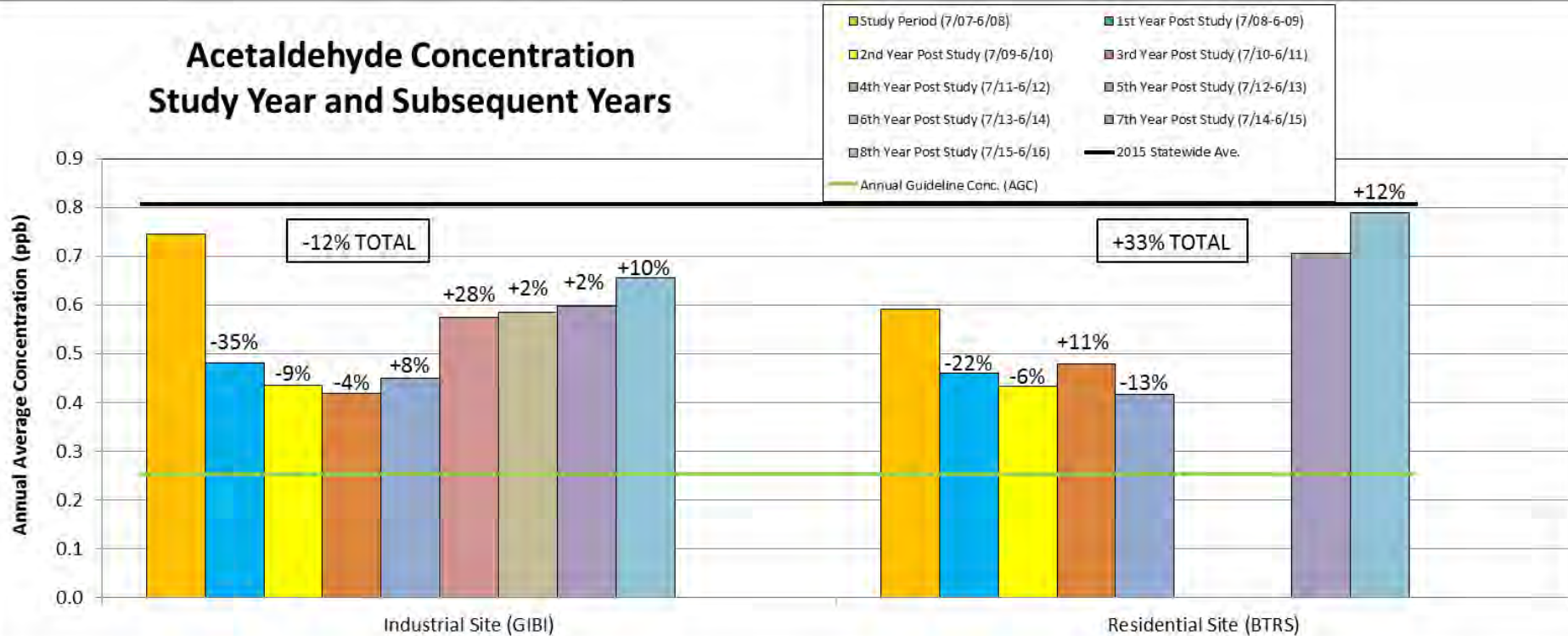




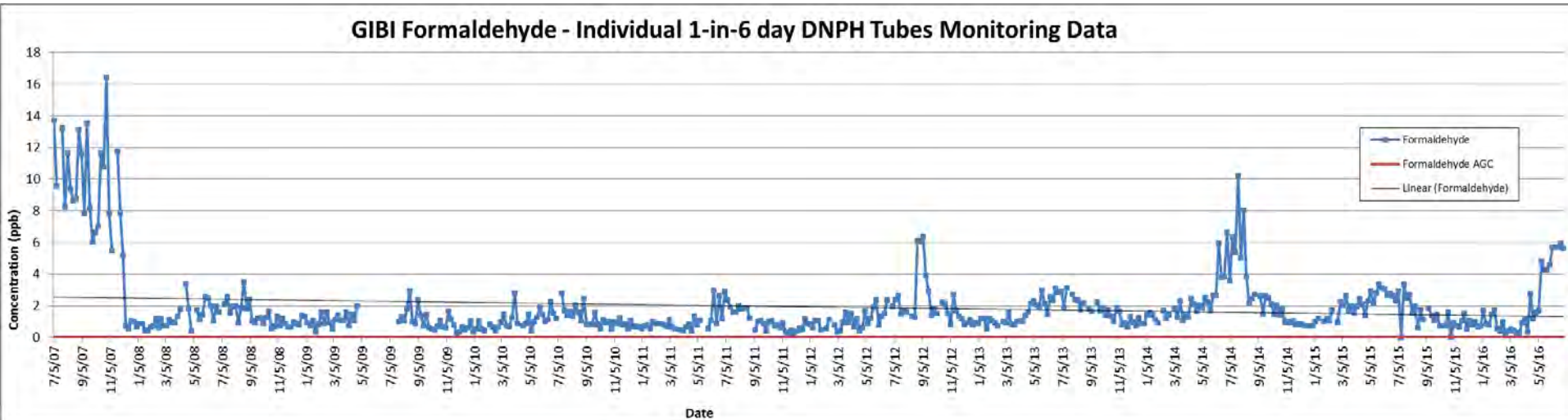
Formaldehyde Concentration Study Year and Subsequent Years



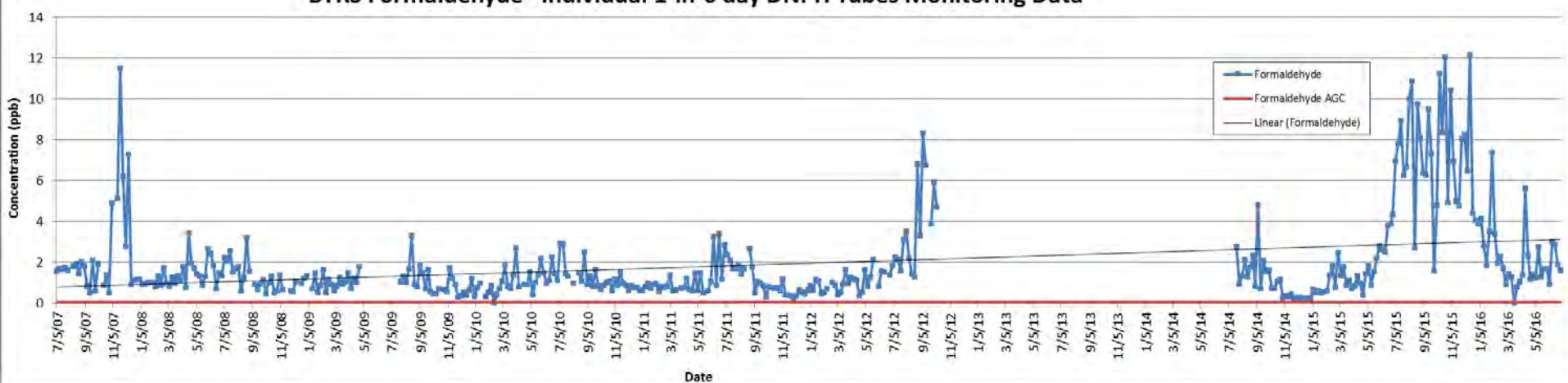
Acetaldehyde Concentration Study Year and Subsequent Years



GIBI Formaldehyde - Individual 1-in-6 day DNPH Tubes Monitoring Data



BTRS Formaldehyde - Individual 1-in-6 day DNPH Tubes Monitoring Data



Formaldehyde Sources in Tonawanda

Point Sources

- Indeck Yerkes Energy Services
- NRG Huntley Electric Generating
- Tonawanda Coke
- Industrial Boilers
 - 3M Tonawanda
 - FMC Corp.
 - Goodyear Dunlop Tires

Area Sources

- Residential Space Heating – natural gas combustion

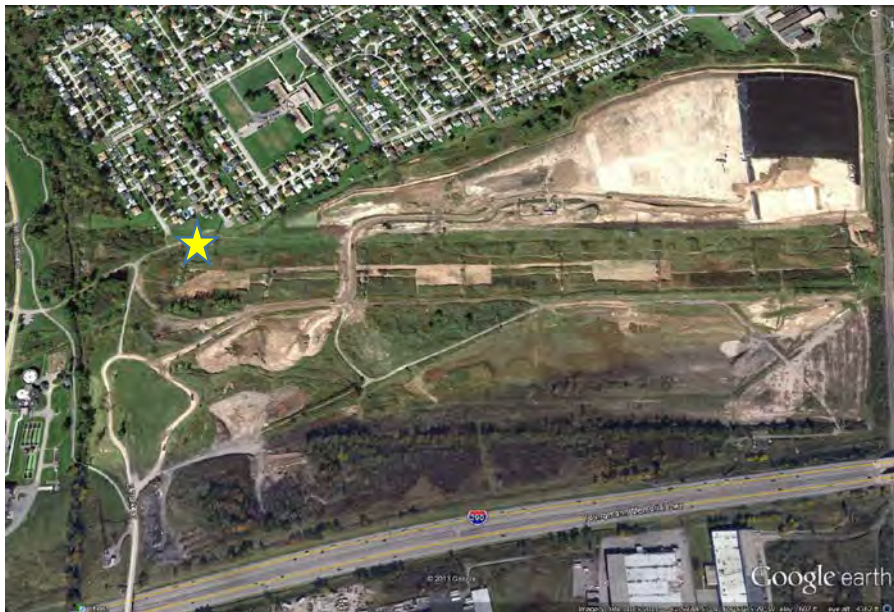
Mobile Sources

- Cars and on and off road diesel truck/equipment exhaust

Other - Secondary Atmospheric Formation/Biogenic Emissions



2013 View BTRS



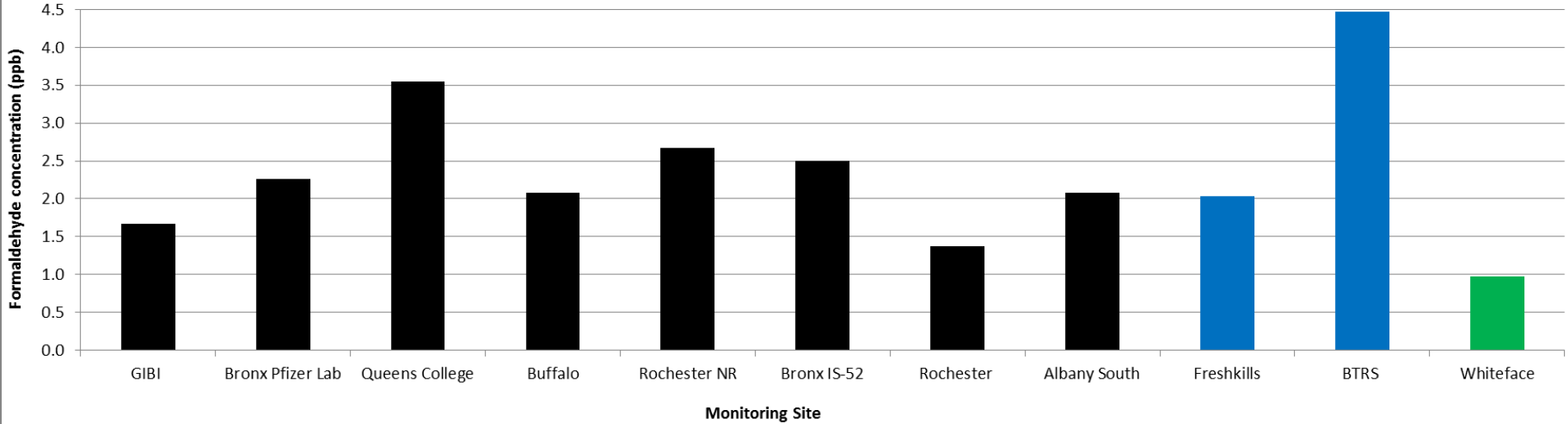
2016 View BTRS



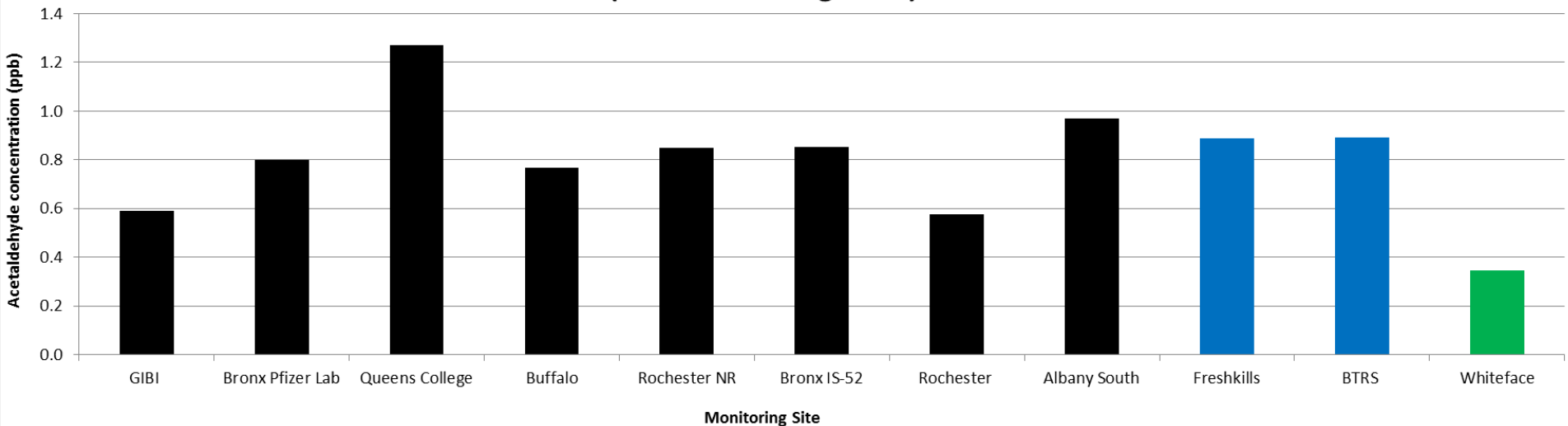


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2015 Annual Average Formaldehyde Concentrations at Statewide Sites (Location Setting Code)



2015 Annual Average Acetaldehyde Concentrations at Statewide Sites (Location Setting Code)



Conclusions

- Large emission reductions from Tonawanda Coke are evident in the benzene and 1,3 – butadiene data at GIBI and BTRS monitoring locations.
- Increase in carbonyl data at BTRS location is the result of near-by heavy duty diesel construction equipment and diesel truck activity.
- Carbonyl concentrations should decrease with the cessation of construction in the area.



Thank You

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Lab Test Results from HDD Engine Testing

Table 2: Carbonyl Emissions (mg/bhp-hr)

Carbonyl	LSD		<u>Equilon-ULSD</u>				Tosco-ULSD		
	EO	DOC	EO	DOC	CRT	EGRT	DOC	CRT	EGRT
Formaldehyde	34.37	9.34	74.73	9.83	0.02	0.00	7.27	0.30	0.19
Acetaldehyde	15.05	5.08	14.08	5.43	1.78	1.63	7.28	1.61	2.15
<u>Acrolein</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Propionaldehyde</u>	3.58	0.00	3.07	0.00	0.00	0.00	0.00	0.00	0.00
<u>Crotonaldehyde</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Butyraldehyde</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzaldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Isovaleraldehyde</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Valeraldehyde</u>	2.22	0.00	1.84	0.00	0.00	0.46	0.00	0.00	0.00
<u>o-Tolualdehyde</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>m-Tolualdehyde & p-Tolualdehyde</u>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Hexanaldehyde</u>	0.00	0.00	2.16	0.00	0.00	0.00	0.00	0.35	0.00
2,5-dimethylbenzaldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Tang et. al (2007) Unregulated Emissions from a Heavy-Duty Diesel Engine with Various Fuels and Emission Control Systems. Environmental Science & Technology 41: 5037 - 5043



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