HHD Benzene Air Pollution Action Levels

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HOUSTON HEALTH DEPARTMENT

Background

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- The Intercontinental Terminals Company, LLC (ITC) fire in Deer Park and the Valero floating roof tank leak, represent benzene air pollution events not quickly resolved.

- Benzene air pollution is a consistent problem in Houston.

Background

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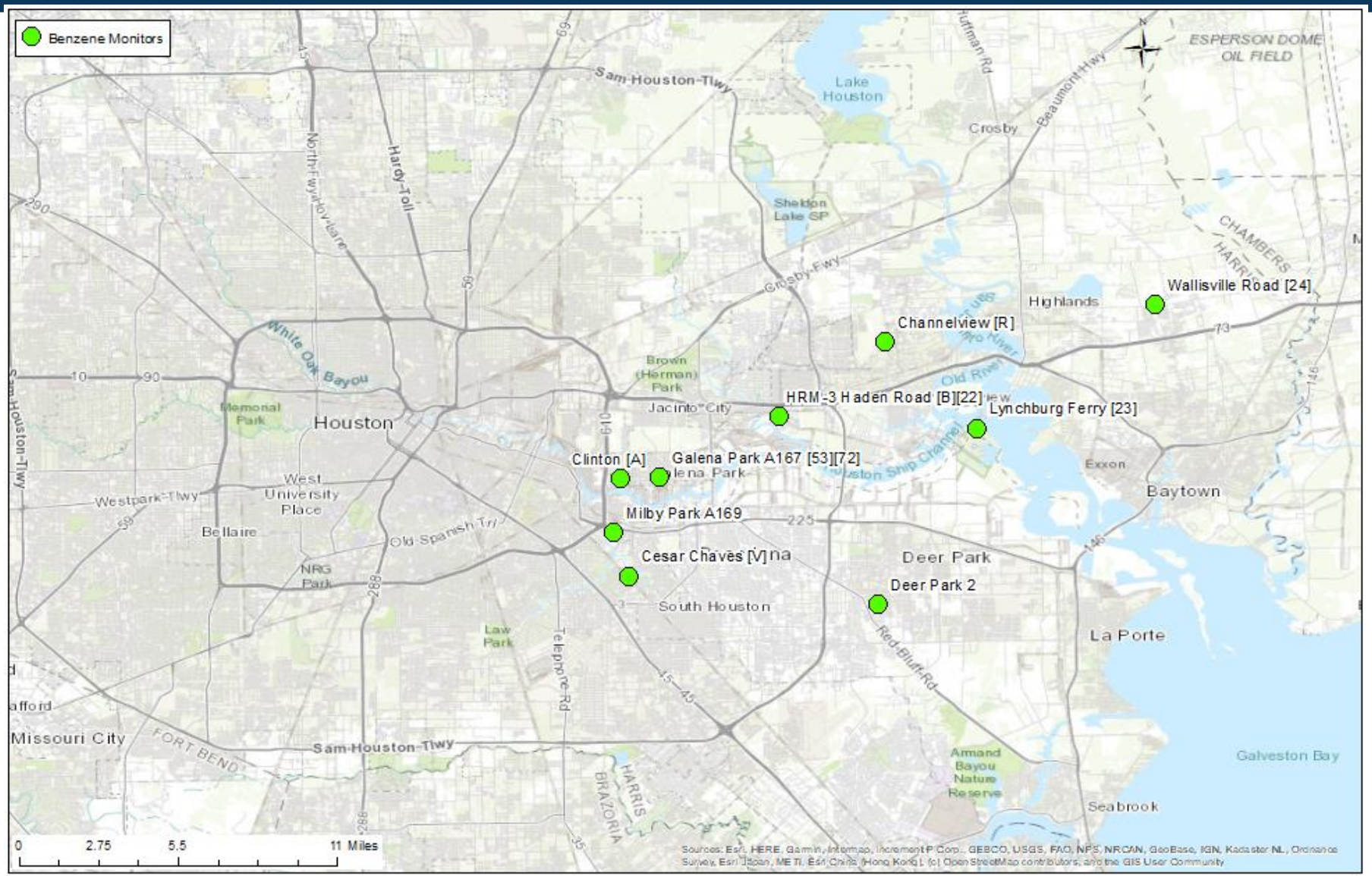

Background

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- Inhalation of benzene leads to dysregulated immune response, hepatotoxicity and leukemia, the degree of risk of disease differing by the exposure duration and the level of contamination.
- There is no regulatory standard for benzene air pollution.
- Action levels are needed in emergencies.
- It is critical to use action levels derived from current scientific knowledge to inform possible alerts to shelter in place or evacuate a local area.

Action Level Identification

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- CDC funded
- HHD subcontract to external toxicologists: Dr. Cloelle Danforth, Dr. Elena Craft and Dr. Chris Portier.

Action Level Identification

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- Review of the recent toxicologic & epidemiologic literature on short term health effects of benzene
- Compare/Evaluate existing short-term exposure guidelines for benzene.
- Recommend short-term exposure guidelines for benzene that pose different risks for the community

Action Levels

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Readiness Condition	Action	Triggering event(s) to escalate readiness to action (Benzene concentration, duration)
1	Evacuate	>200 ppb in an hour
2	Shelter in place	average >72 ppb in an hour
3	Confirm levels, and communicate to public – AQ alert	>27 ppb in an hour (two consecutive measurements); >3 ppb for 48 hrs
4	Deploy monitors, contact/investigate likely source – continue to monitor	> 27 ppb in an hour twice in two weeks > 3 ppb averaged over 24-hrs
5	Stationary monitoring	all values below 3 ppb

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Number Days with High Benzene Concentrations
Hourly Averages Reported from TCEQ Air Monitors 2019

Number of Days above Benzene Concentration Levels	Channelview	Galena Park	Milby Park	Haden Rd	Lynchburg Ferry	Clinton	Deer Park	Cesar Chavez
Total Hours	7525	6992	7692	7146	7515	6942	6529	7299
Number of Hours >1 ppb	586	1408	202	651	817	395	331	256
(measured)	8%	20%	3%	9%	11%	6%	5%	4%
Number of 24-hrs > 3 ppb	**3**	**16**	**0**	**2**	**13**	**0**	**4**	**1**
(measured)	0.96%	5.49%	0.00%	0.67%	4.15%	0.00%	1.47%	0.33%
Number of Hours >26 ppb	**11**	**17**	**0**	**2**	**21**	**0**	**10**	**1**
(measured)	0.15%	0.24%	0.00%	0.03%	0.28%	0.00%	0.15%	0.01%
max	132.84	75.78	14.27	65.98	196.94	15.12	190.68	103.84
avg	0.55	0.95	0.21	0.46	0.74	0.34	0.36	0.29
std	3.51	2.85	0.38	1.17	5.05	0.59	2.93	1.30