

Coal Dust from Coal Trains Increases Mortality

Presentation for Contra Costa Hazardous Materials Commission

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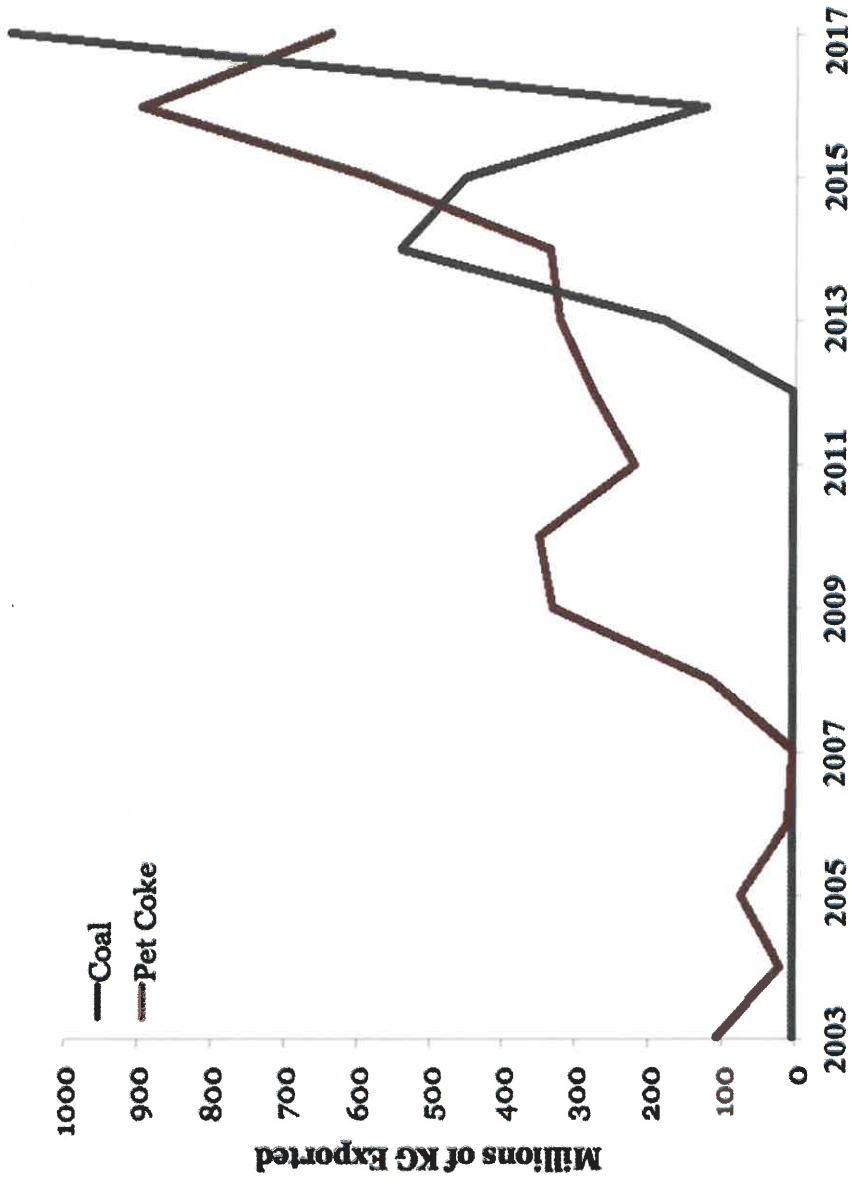
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Outline of Presentation

- Health Emergency - Rapid rise in coal exports through Richmond and coal trains spewing toxic dust in Contra Costa County
- Coal dust blows from coal trains
- Health hazards of coal dust
- Mitigation procedures do not work

Port of Richmond Exports of Coal and Petcoke



2017 through December

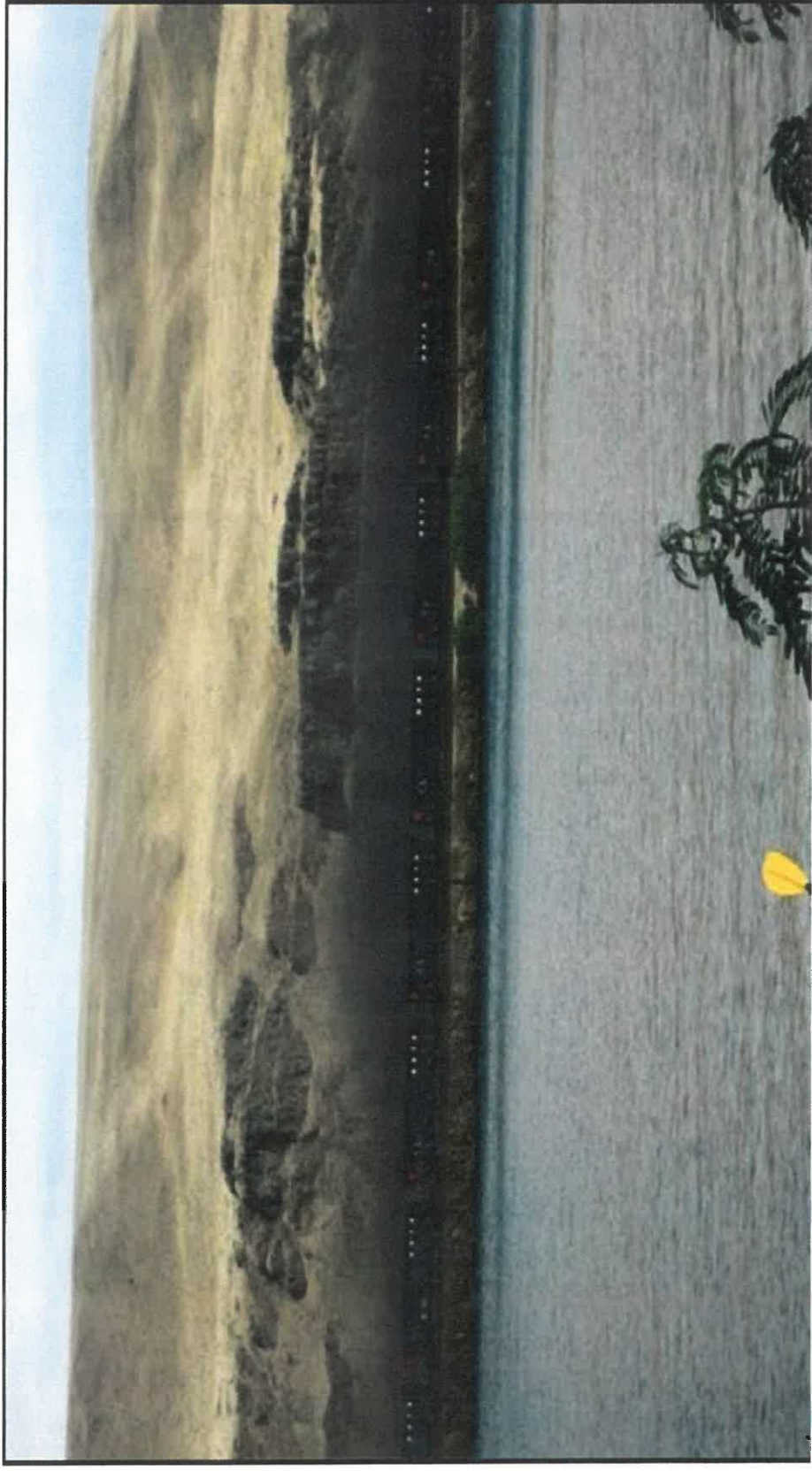
Source: US Census International Trade

Port of Richmond Exports of Coal & Petcoke

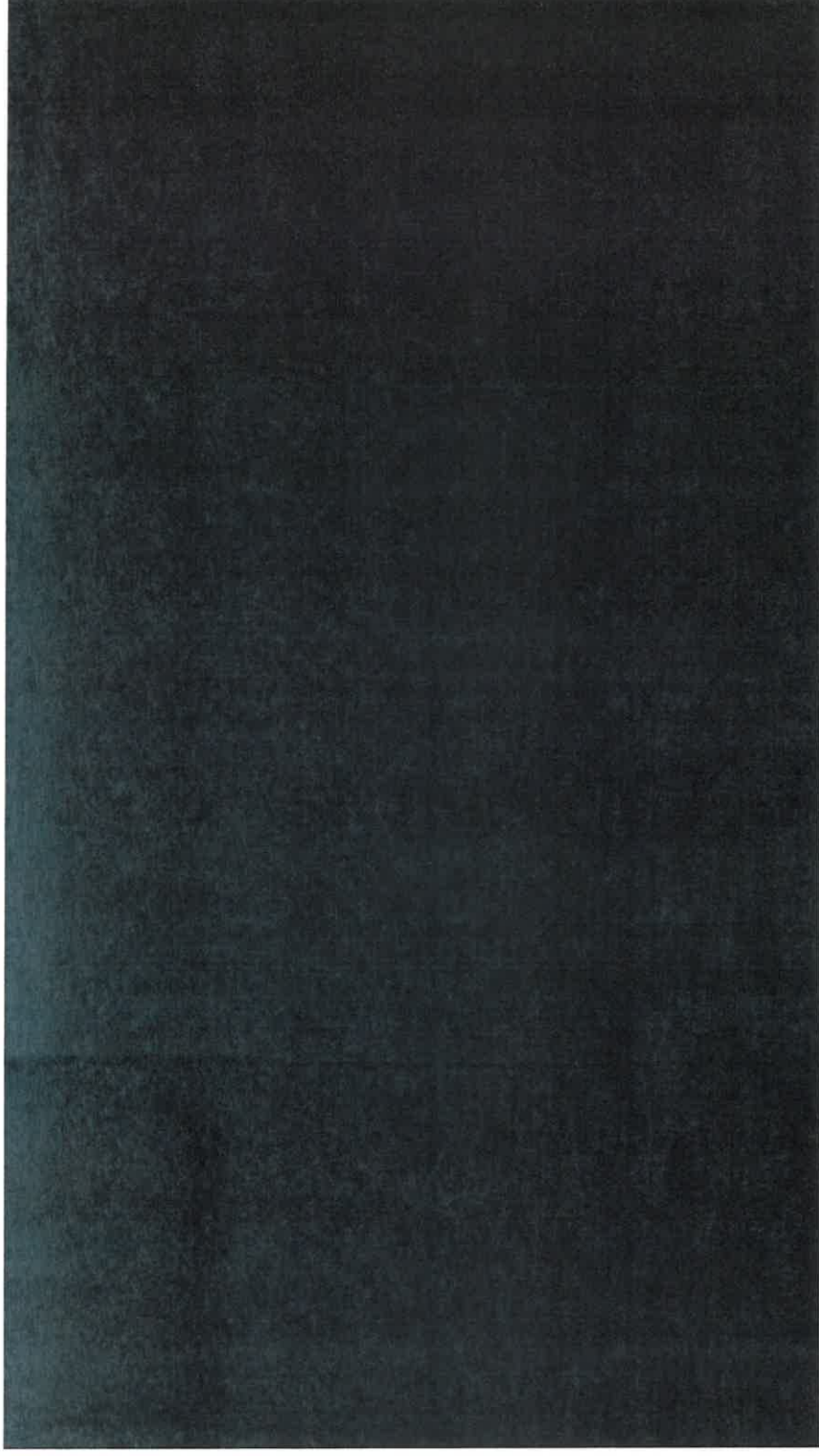
Year	Coal Metric Tons (000)	Petcoke Metric Tons (000)	Total Metric Tons (000)
2013	176	322	498
2014	540	335	875
2015	453	580	1033
2016	130	906	1036
2017	1076	640	1716

Source: US Census International Trade

Coal Train Columbia River



Video of
train
spewing
coal dust



Rail lines in Richmond

Black = Rail lines
Orange = Freeways



Levin Richmond Terminal



Train Loaded with Coal approaches Levin-Richmond Terminal, Richmond, CA 7/23/2015



<https://www.sfchronicle.com/opinion/letterstoeditor/article/Letters-to-the-Editor-March-21-6924396.php>

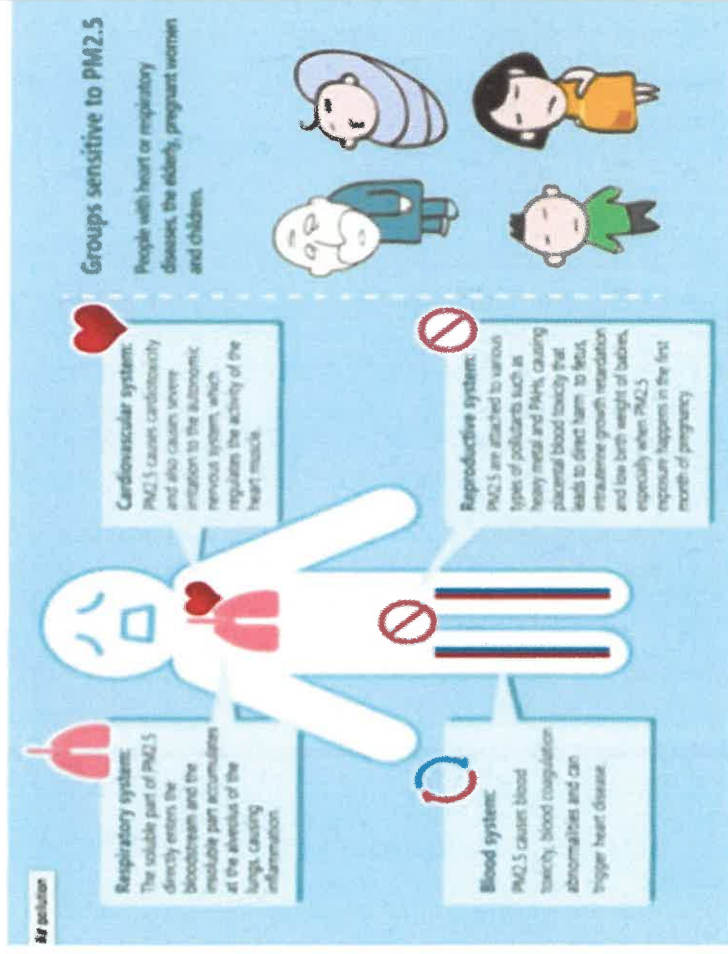
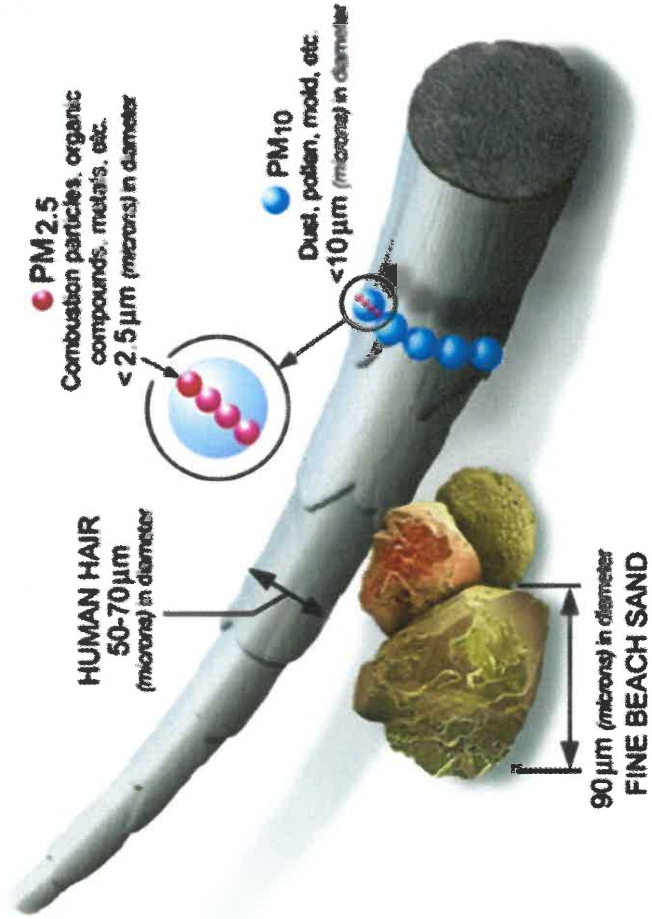
Accessed April 16, 2018



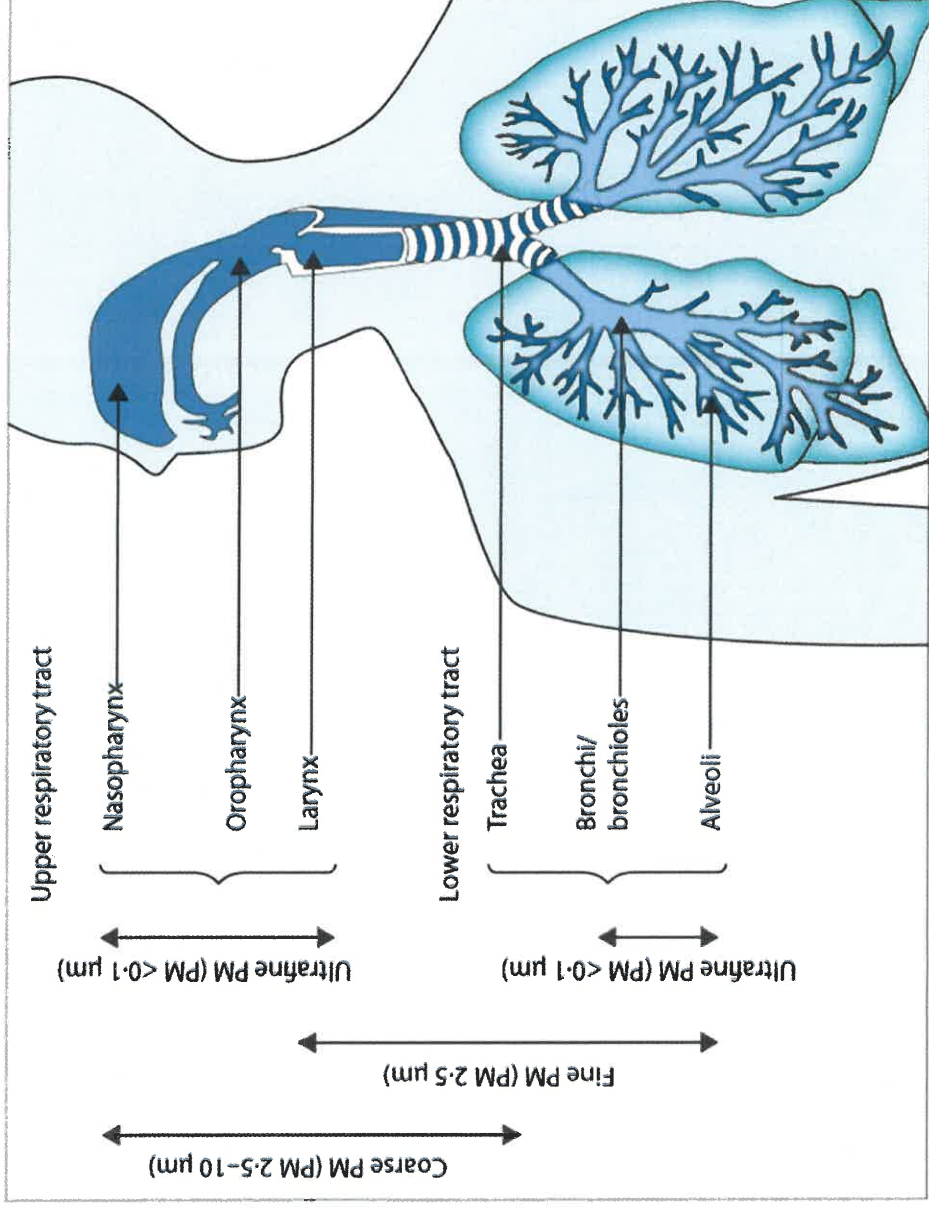
<http://ww2.kqed.org/science/wp-content/uploads/sites/35/2015/06/Petcoke-2-e1441919985717.jpg>

Accessed 4/16/18

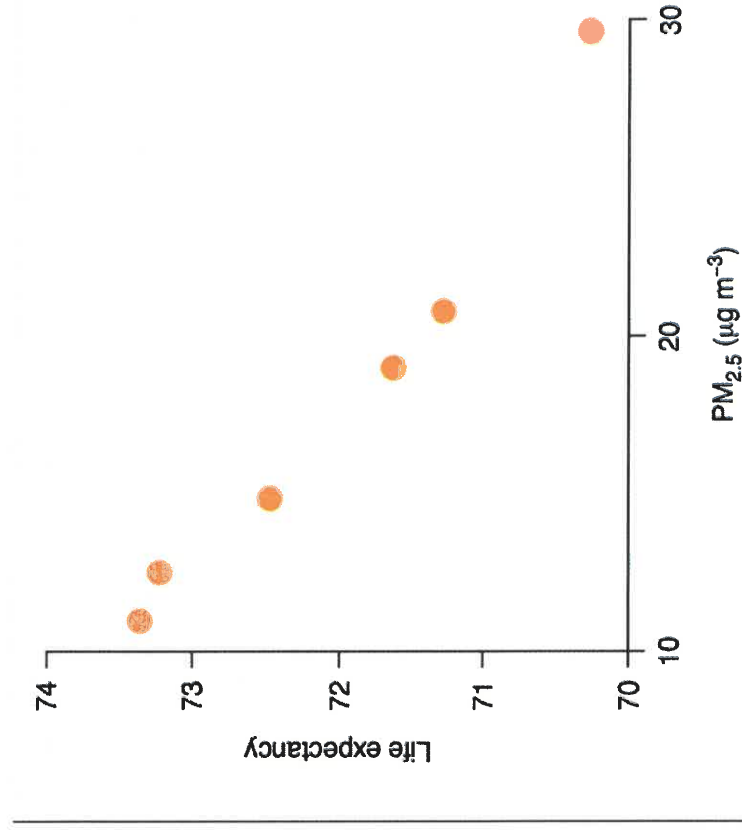
What is PM_{2.5} ?



Where Particulate Matter Deposits

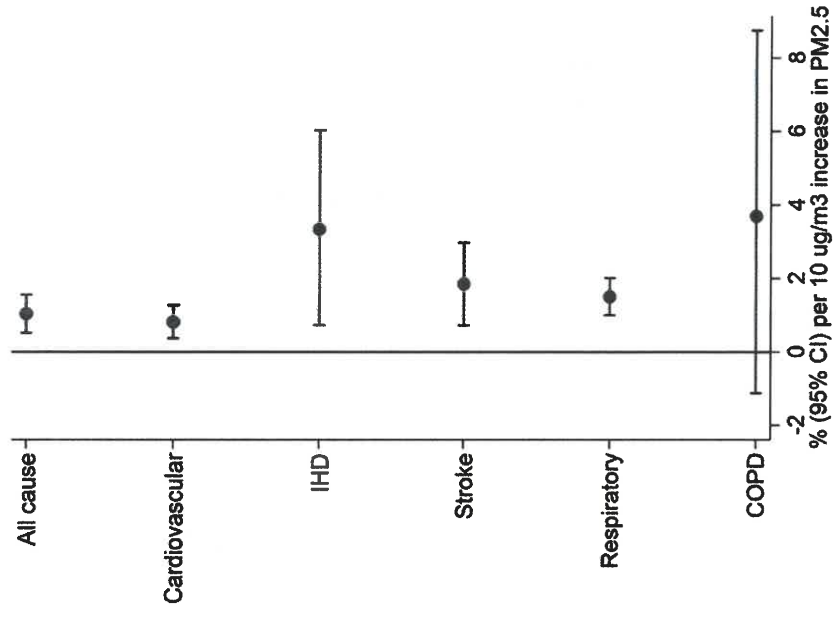


Life expectancy versus PM_{2.5} in the Harvard Six City Study



Source: Schwartz J. 2011. Life Expectancy adjusted for age, sex, cigarette smoking. Occupation, education. obesity, and chronic disease

Summary estimates (95% confidence intervals) for all-cause and cause-specific mortality



R W Atkinson et al. Thorax 2014;69:660-665

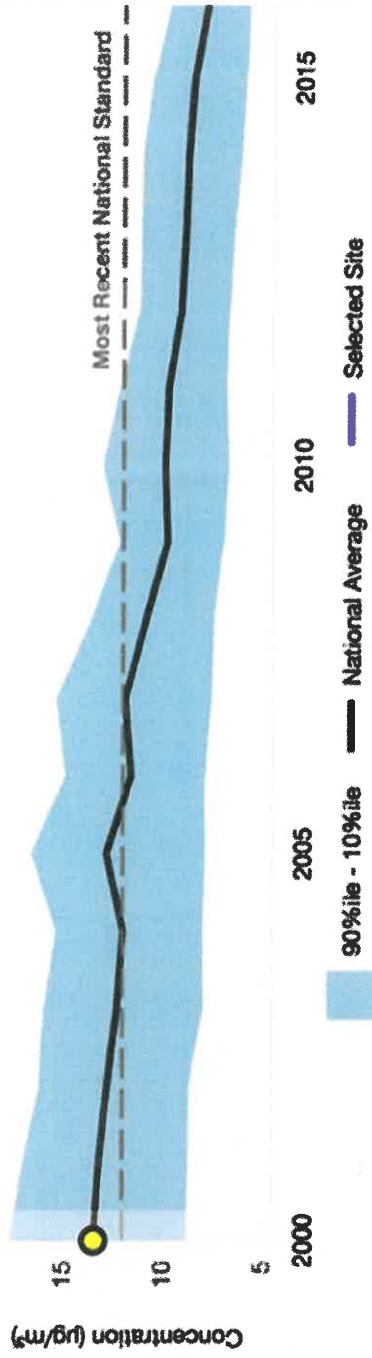
Morbidity from Elevated PM2.5

- Diabetes Type 2
- Low Birth Weight
- Alzheimer's Disease
- Asthma and COPD
 - Exacerbations – ER visits & Hospitalizations
 - New-onset
- Lung Cancer
- Respiratory infections (pneumonia)
- Stroke
- Congestive heart failure

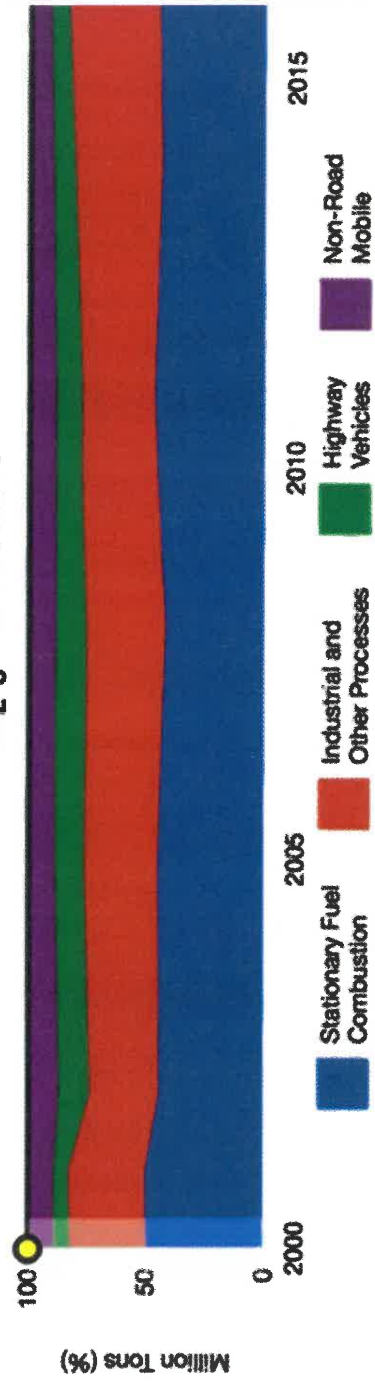
Highest Risk

- Elderly
- Babies & Children
- Pregnant women
- Poor
- Stressed
- Other illnesses

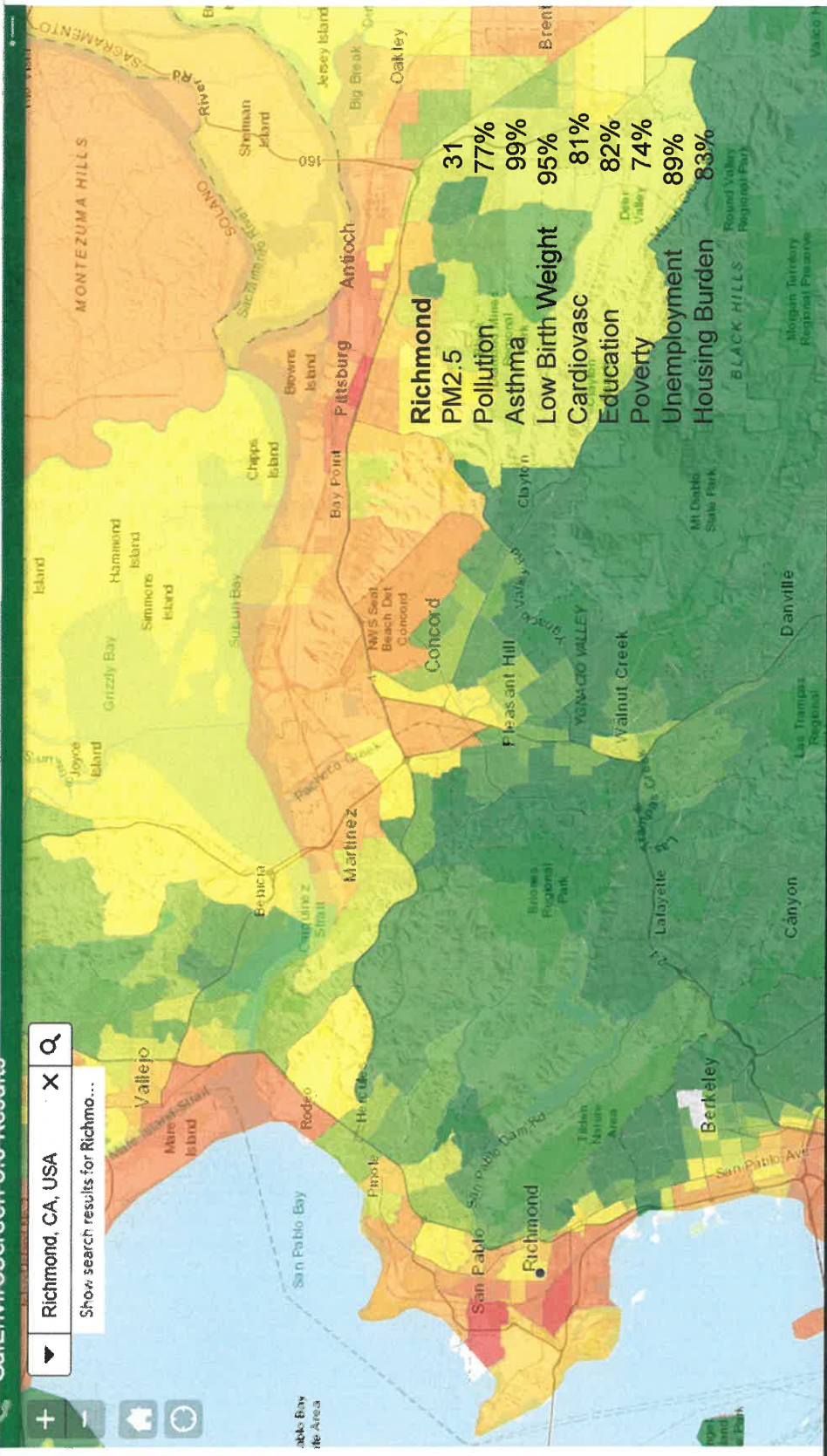
PM_{2.5} Annual Concentration



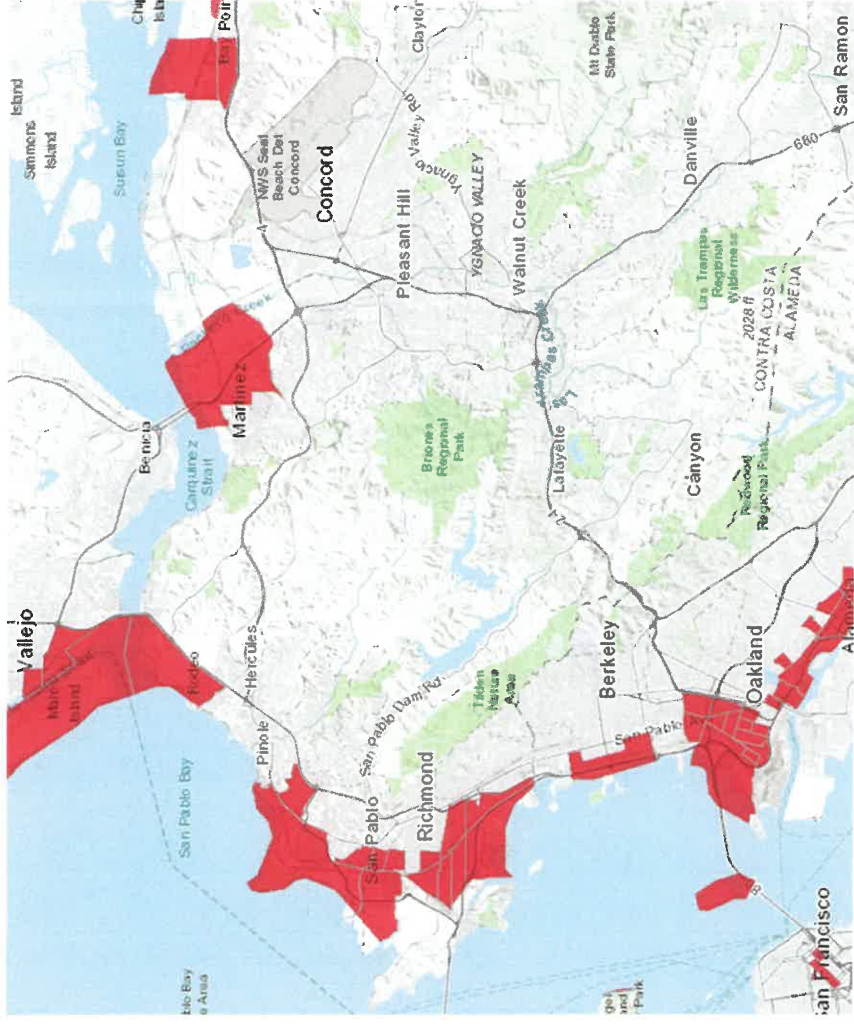
Direct PM_{2.5} Emissions



Richmond, CA, USA X Q
Show search results for Richmo...



SB 535 Disadvantaged Communities 2017 CalEnviroScreen 3.0



Health hazards of coal dust

- Communities near coal terminals have demonstrated worse health problems
 - Virginia community near large coal terminal rates of asthma 2X city and state average
 - England community near coal exporting handling <2MMTPA high levels of asthma

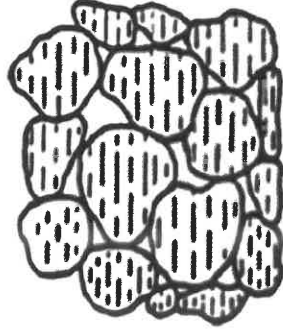
Waterways and Coal Rail lines

- Wildcat Creek
- San Pablo
Creek
- Garrity Creek
- Pinole Creek
- Refugio Creek

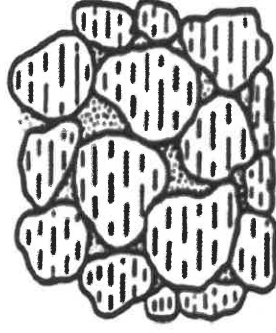


Derailment

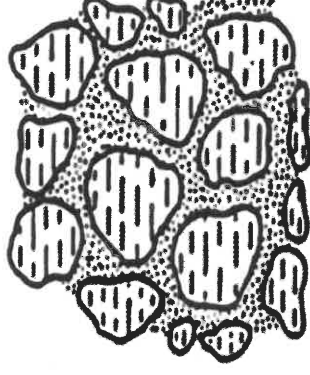
- Between July 2012 -2013, at least 40 coal trains in the US derailed, causing four victims to lose their lives, large amounts of coal to spill, major delay to other rail users and significant repair costs
- How coal dust destabilizes train tracks by filling in spaces between ballast



Clean Ballast



**Partially Fouled
Ballast**



**Heavily Fouled
Ballast**

Derailment from Fouled Ballast



Note coal dust deposit
in ballast drainage area



What is below ballast
when you "scratch the surface"



Coal dust in
ballast section

Figure 18: Pictures posted on BNSF website showing effect of coal dust on train ballast. Note that the coal dust is not always visible at the surface of the ballast, as it accumulates between the aggregate (rocks).

Source: Z Chafe 2016

Current dust mitigation procedures not effective

- No covers for coal cars commercially available
 - Coal dust EXPLOSIVE (ignites at 260-265 degrees F)
- Surfactants sprayed on open coal cars do not completely mitigate coal dust
 - Surfactants degrade over time and distance from mines
 - are not currently required
 - BNSF acknowledges that even if application is required, “there can be significant variation in the quality and consistency of the physical application of topical treatments at the mines”
 - Surfactants may have potential health threats and safety

Richmond Community Action

- 2015 – Resolution by Richmond City Council opposing the transport of Coal and Petcoke along California waterways and through Richmond and other densely populated area
- 2017 – No Coal in Richmond coalition:
 - Sierra Club, Communities for a Better Environment, Sunflower Alliance, 350.org, Asian-Pacific Environmental Network

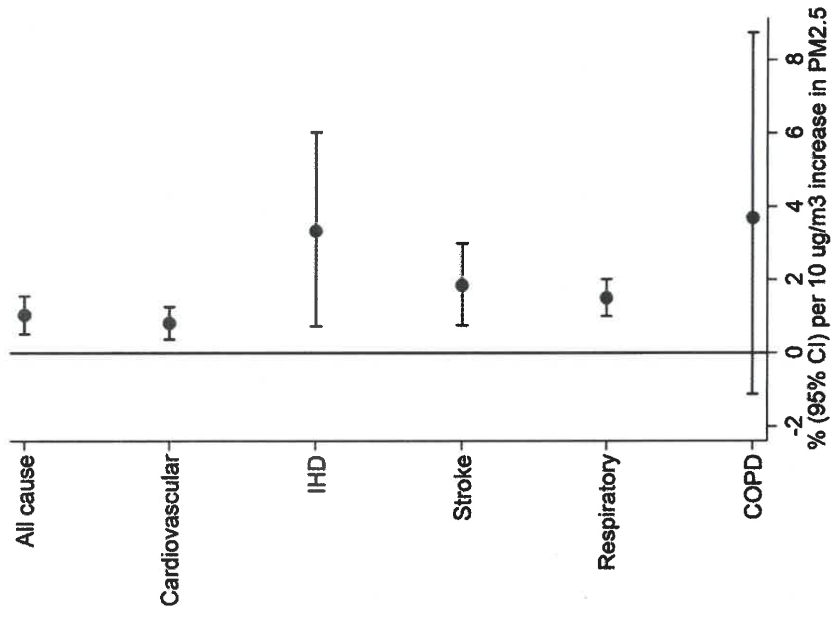
JOIN US at our community meetings every second Wednesday of the month @ 7pm located at 2540 Macdonald Ave, Richmond, CA 94801

Parchester village and Marina Bay residents

- Coal dust in yard and on doors and houses
- Chronic cough

How can the Commission decrease air (and water) pollution from coal dust from open coal cars and storing coal and petcoke in open piles at the Terminal?

Summary estimates (95% confidence intervals) for all-cause and cause-specific mortality.



R W Atkinson et al. Thorax 2014;69:660-665



Odds Ratio for Cardiovascular Disease and Respiratory Mortality

For every 10microg/m³ Increase in Long Term PM_{2.5} Exposure

PM_{2.5} Exposure Type: Odds Ratio (95% CI):

All mortality cases long-term PM_{2.5} 1.6 (1.5–1.8)

All mortality cases local PM_{2.5} 1.4 (1.3–1.5)

Urban areas 1.7 (1.5–1.9)

Rural areas 1.3 (1.1–1.6)

High education 1.4 (1.2–1.6)

Low education 1.9 (1.60–2.1)

Source: Kloog et al. 2013

Coal dust harmful to fish and wildlife

- Coal trains move along the Sacramento River, Sacramento – San Joaquin Delta, Richmond Riviera, and Santa Fe Channel