

West Oakland Health Risk Assessment Preliminary Summary of Results



March 19, 2008



Air Resources Board

California Environmental Protection Agency

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Preliminary Summary of Results

Why not wait for final study?

- Results unlikely to significantly change
- Important to get information out now
 - Bond funding applications due soon
 - Port of Oakland MAQIP process
 - BAAQMD Green Ports Initiative
 - Community request

When will final report be done?

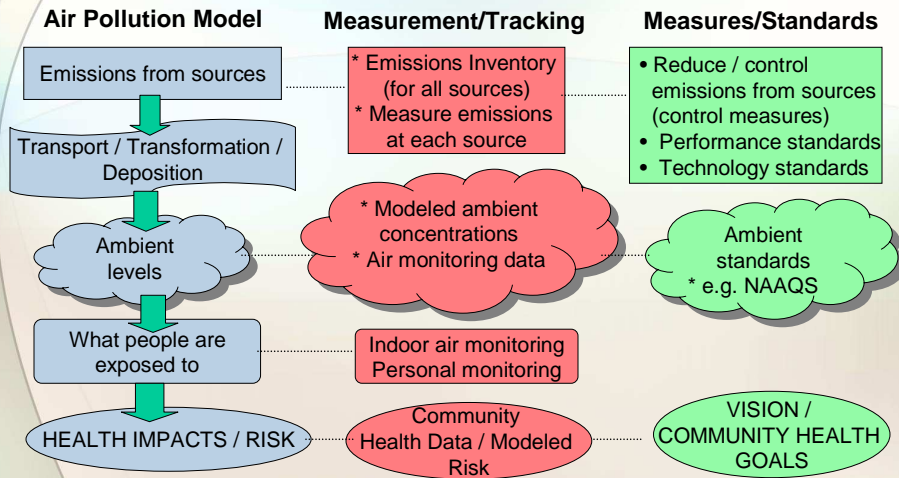
- June timeframe

What information will be in final report?

- Additional technical information on modeling
- Additional risk and non cancer health impacts analysis
- Final report in June is not end of process; BAAQMD has committed to updating HRA results, as necessary

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Pacific Institute and West Oakland Environmental Indicator's Project Overview



Pacific Institute & West Oakland EIP * swati@pacinst.org * www.pacinst.org

What is a Health Risk Assessment ?

Evaluation of the potential for a chemical to cause cancer or other illness



- Uses mathematical / computer models to estimate exposure and risk
- Risk expressed as chance of potential cancer in a population of a million over a 70-year lifetime

Example: "10 in a million risk"

Risk Assessments – Estimate Potential Health Impacts

Do:

- Provide an estimate of the amount of a pollutant in the air
- Predict or estimate the lifetime cancer risk and other health impacts – in this case for diesel PM

Don't:

- Actually measure amount of diesel PM in the air
- Gather / use health data on local residents

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Overview of West Oakland Risk Assessment

- Assessment focuses on diesel PM emissions
- Based on emissions in 2005
- 3 complementary parts
 - **Part I: Maritime Port of Oakland**
 - **Part II: Union Pacific Rail Yard**
 - **Part III: Sources in [adjacent to] West Oakland**
- Estimates the potential lifetime cancer risk and other health impacts based on modeled estimates of diesel PM



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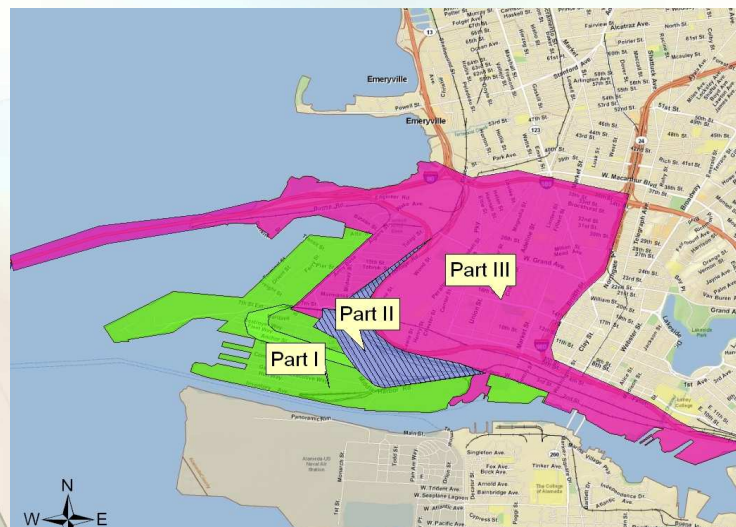
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Sources of Diesel PM Evaluated in the HRA

Area	Description	Emission Sources Inventoried
Part I	Maritime Port of Oakland	ocean-going vessels, commercial harbor craft, cargo handling equipment, port drayage trucks, on-port locomotives
Part II	Union Pacific Railyard	locomotives, cargo handling equipment, truck refrigeration units and reefer cars, drayage trucks
Part III	Areas in and adjacent to the West Oakland Community	on-road trucks, ocean-going vessels, commercial harbor craft, cargo handling equipment, locomotives, Amtrak Maintenance facility, major construction projects, stationary point sources, truck-based businesses and distribution centers

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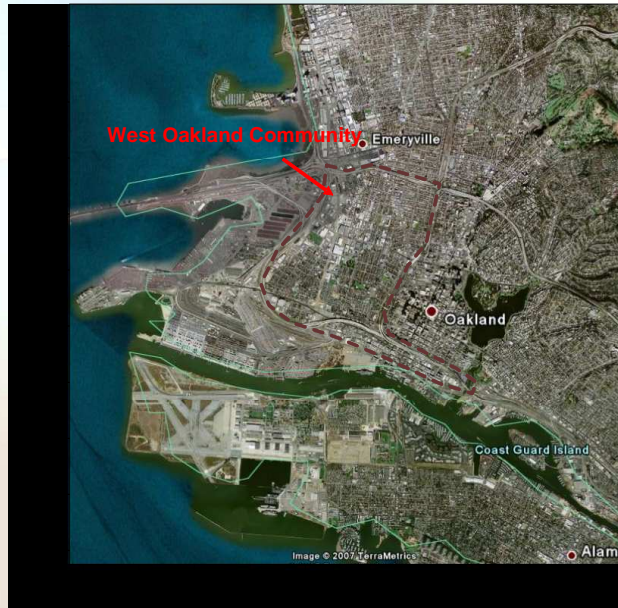
Where the Emissions Are Located (Domain) Land Sources



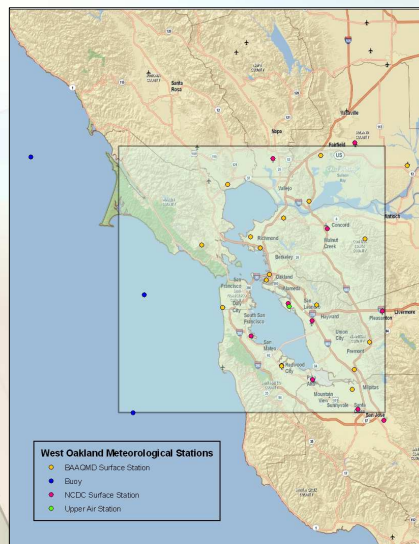
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West Oakland Modeling Domain

10 km x 10 km



Location of Meteorological Stations Providing Data for the HRA



30 inland surface stations
3 ocean buoys, and
1 upper air station

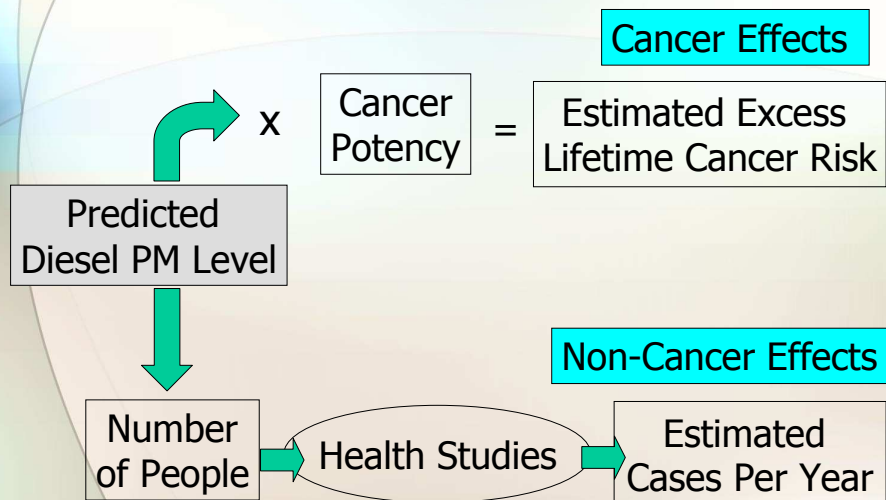
Emissions Inventory Used in Modeling Year 2005* - tons per year (tpy)

*Does not include businesses or emission sources established after 2005

Part I - Port of Oakland	265 tpy
Part II - UP Rail Yard	11 tpy
Part III - Other West Oakland <small>(Sources in and adjacent to)</small>	568 tpy
TOTAL	845 tpy

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Predicting Health Effects



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Preliminary Summary of Results and Key Findings



Key Findings

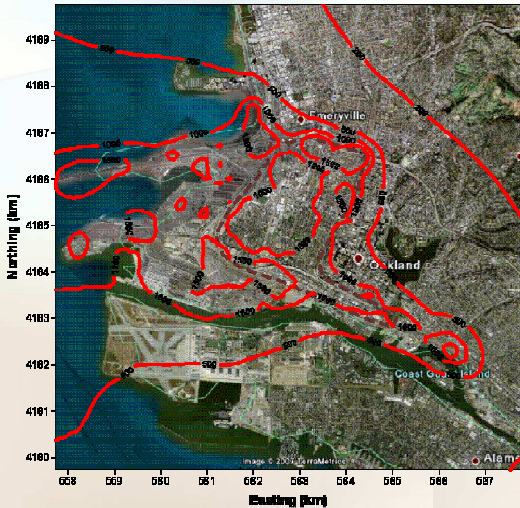
- The West Oakland community is exposed to diesel PM concentrations that are almost three times the estimated background diesel PM concentrations in the BAAQMD.
- The estimated lifetime potential cancer risk for residents of West Oakland from exposure to diesel PM emissions is about 1,200 excess cancers per million.
 - Port operations: 200 excess cancers per million
 - UP Rail Yard: 40 excess cancers per million.
 - Non-Port and non-UP sources: about 950 excess cancers per million

Key Findings

- On-road heavy-duty trucks result in the largest contribution to the overall potential cancer risks levels in the West Oakland community, followed by ships, harbor craft, locomotives, and cargo handling equipment.



Estimated Diesel PM Cancer Risk from All Emissions Sources for West Oakland Community



Potential Cancer Impacts on West Oakland

Population-weighted or Average Potential Cancer Risks in West Oakland Community by Part and by Source Category

Source Category	Part-I - Port	Part-II - UP	Part-III - All Other	Combined
Trucks	42	7	795	844
Harbor Craft	15	0	78	93
Ships Transiting, Maneuvering, & Anchoring	57	0	23	81
Ships at Berth	57	0	10	67
Locomotives	4	15	37	56
Cargo Handling Equip.	16	21	7	43
Others	0	0	2	2
Total	192 (16%)	43 (4%)	951 (80%)	1186 (100%)

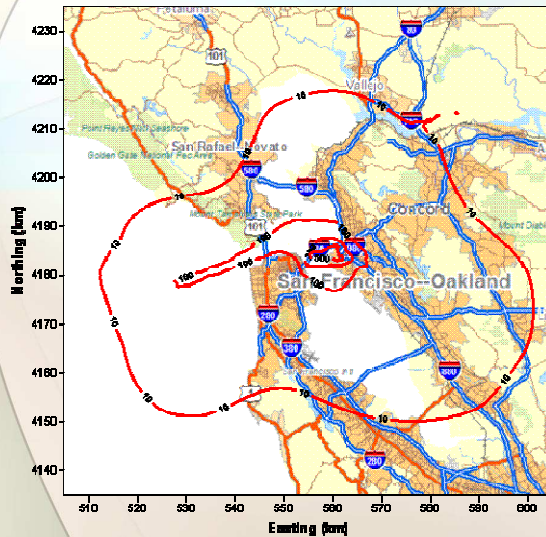
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Relative Change in Potential Cancer Risk per Ton of Diesel PM Emissions Reduced (2005)

Source Category	Part I (Port)	Part II (UP)	Part III (Non-Port/Non-UP)
	Risk / Emissions		
Ship Transiting	0.4	--	0.1
Ships at Berth	0.9	--	0.3
Harbor Craft	1.1	--	0.3
Trucks	2.1	3.8	8.8
Cargo Handling Equip.	0.7	3.9	1.6
Locomotives	2.0	3.9	7.9
Others	-		0.1

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Estimated Potential Cancer Risk in the Regional Domain from Port (Part I) Emissions Sources



- Average potential cancer risk over the region from Port (part I) diesel PM emissions is 27 per million
- Regional impact primarily due to ships (transiting and at berth)
- Added to background risk of 480 from diesel PM

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Estimated Non-cancer Health Impacts Resulting from Port Operation 2005 Diesel PM Emissions

Endpoint	# of Cases per Year (Mean)
Premature Death	18
Hospital Admission (Respiratory and Cardiovascular)	8
Asthma-Related and Lower Respiratory Symptoms	290
Acute Bronchitis	24
Work Loss Day	2,600
Minor Restricted Activity Days	15,000

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Key Findings

- Predicted diesel PM emissions and risks will be reduced by 80% in 2015 but remaining risk levels are still high – over 200 in a million
- Additional actions in near-term necessary to bring risk levels down more quickly and to help off-set growth in future years

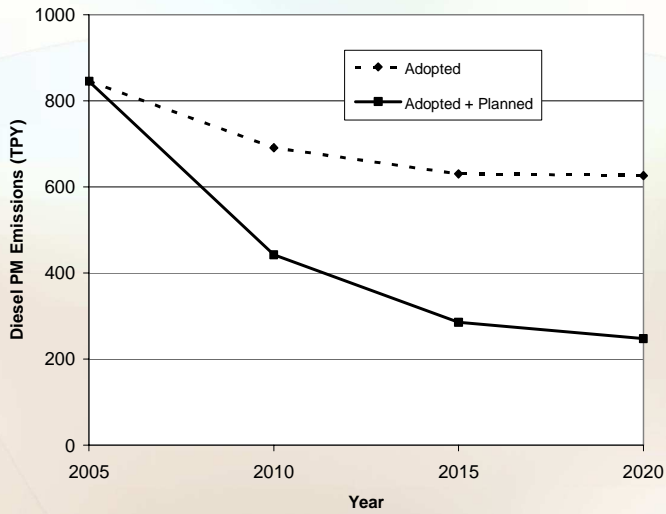
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Diesel PM Measures

- Cleaner diesel fuel
- Fleet rule for transit buses
- Stationary engines
- Portable engines
- Agricultural engines
- Refuse trucks
- Transport refrigeration units (TRUs)
- Incentives – Prop 1B
Carl Moyer
- Auxiliary engines for ships
- Cargo handling equipment
- Truck idling
- Off-road private fleets
- Harbor craft
- Port Drayage Trucks
- Shore side Power
- Ship Main Engines (2008)
- On-Road Private Trucks (2008)

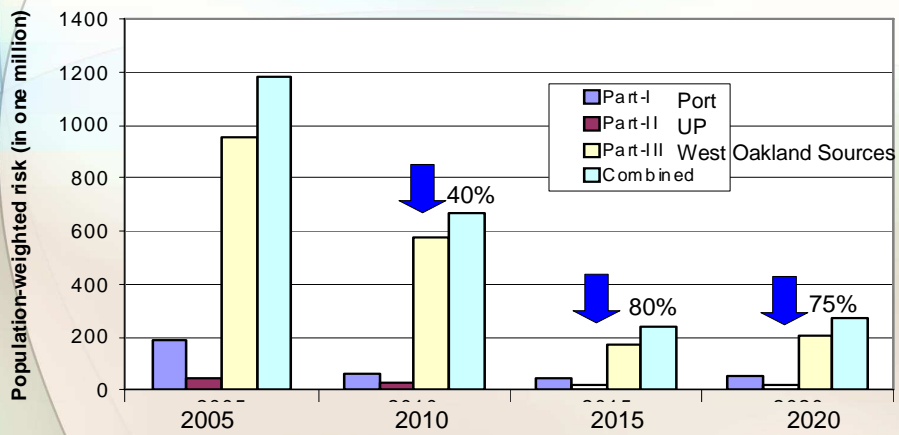
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Projected Future Emissions



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Projected Risk Levels 2010, 2015, and 2020 (with ARB regulations and growth)



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Recommendations & Next Steps



Recommendations

- Maximize emissions and risk reduction as quickly and early as possible
- Build and leverage funding sources to ease transition to clean technologies
- Ensure successful implementation of ARB regulations
- Continue to study trucking operations at the Port and in West Oakland

Next Steps

- **Status report to our Board in April**
 - ✓ April 24th, 9 AM
 - ✓ Caltrans Bldg, 111 Grand Ave, Oakland
- **Finalize report**
 - ✓ June timeframe
 - ✓ Additional technical information on modeling
 - ✓ Provide additional risk analysis
 - ✓ Come back to community with final updates
 - ✓ Final report in June is not end of process; BAAQMD has committed to updating HRA results, as necessary
- **ARB consideration of private fleet rule and OGV main engine fuel requirement in 2008**

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Contacts

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Comments

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Air Resources Board

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Where to Find More Information

Air Resources Board:

West Oakland Health Risk Assessment Study

<http://www.arb.ca.gov/ch/communities/ra/westoakland/westoakland.htm>

Port of Oakland :

Seaport Emissions Inventory and Port Construction Inventory Documents

<http://www.portofoakland.com/environm/airEmissions.asp>

Bay Area Air Quality Management District :

STI Report – Truck Related Businesses and Construction in West Oakland

http://www.baaqmd.gov/CARE/care_documents.htm

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