Response to Comments

Port of Oakland 2005 Seaport Air Emissions Inventory

Prepared by

Port of Oakland
530 Water Street
Oakland, CA 94607

November 14, 2007

Port of Oakland 2005 Seaport Air Emissions Inventory

Response to Comments

In August 2007 the Port of Oakland (Port) solicited comments on its Review Copy of the Port of Oakland 2005 Seaport Air Emissions Inventory (Emissions Inventory). A notice was posted on the Port's website and announcements were made in technical and public meetings requesting that comments be submitted to the Port by Friday, August 24, 2007. The Emissions Inventory was also presented to the public as part of the August 21, 2007 meeting co-hosted by the California Air Resources Board (CARB) and the San Francisco Bay Area Air Quality Management District (BAAQMD) to update residents on the West Oakland Health Risk Assessment (HRA). Oral comments were accepted at that meeting.

Three documents were posted for review and comment on the Port website at www.portofoakland.com/environm/airEmissions.asp :

- Review Copy of the Port of Oakland 2005 Seaport Air Emissions Inventory (August 8, 2007),
- Executive Summary of the Emissions Inventory, and
- Overview prepared by the Port staff.

By August 24, 2007, the deadline to submit comments, the Port had received comments from five stakeholders. Two additional comment letters were received on August 29, 2007. Recognizing people's busy schedules, the Port of Oakland will be responding to comments received through August 31, 2007.

In September, two other comment letters related to the emissions inventory were sent to the Port: an e-mail from James D. Fine on behalf of the Environmental Indicators Project dated September 19, 2007, and a letter from Ditching Dirty Diesel (DDD) Collaborative to the California Air Resources Board dated September 14, 2007. Both letters primarily addressed the HRA rather than the emissions inventory. The letters are included in the Attachment to this document, but due to their late submittal, no responses to the comments are provided in the text below. However, after a brief review of these recently received comments, it seems that most of the issues raised in them were also raised by other commentors and are addressed in this Response to Comments document.

A response to each of the comments received prior to August 31, 2007 is provided below. For the convenience of the reader, a summary of each comment is included, but the reader should refer to the comment letters and e-mails included in Attachment A for the exact wording of the comment. Comments that relate to the HRA being prepared by CARB are outside the scope of the Emissions Inventory, so may not be fully addressed in this response.

Letter A: **Mr. Kenny Levin, Business Director**
San Francisco Bar Pilots
See e-mail dated 8/16/2007 page 11

Comment A-1:
"Pilot Buoy" should be replaced with "Sea Buoy" in the Emissions Inventory.

Response: All references to "Pilot Buoy" in the report were replaced with "Sea Buoy".

Comment A-2:
The word "engine" on page 2-4, third paragraph, first line, should be replaced with "engine power" or similar term.

Response: After consulting with ENVIRON, Port staff made the edit suggested.

Comment A-3:
The vessel speed of 10 knots shown in Table 2-4, page 2-7 only occurs when transferring the pilot. As soon as the pilot is aboard, the vessel will likely return to a higher speed such as cruise speed.

Response: For the emission inventory, it was assumed that while the pilot was boarding the vessel, the ship traveled 1.7 miles at the speed of 10 knots then returned to cruise speed. This was considered a reasonable estimate.

Comment A-4:
The assumptions made for auxiliary power and load, based on the information in Appendix C are sound and prudent.

Response: Comment noted.

Letter B: **Mr. Steve Lowe, VP**
West Oakland Commerce Association
See Public Comments & Questions Form submitted to Port staff during the 8/21/2007 public meeting, page 12

Comment B-1:
What impact in Bay Area air quality will the Port's barge operations have should that anticipated system be employed?

Response: Air quality and other impacts will be evaluated in an environmental document that shall be prepared and certified when, and if, the Port approves a barge operation.

Comment B-2:
If a reconfiguration of Army Base lands will encourage the majority of West Oakland's trucking firms to consolidate into a new, super efficient truck-friendly facility (and therefore reduce emission significantly) why would the Port not encourage such a higher and better use of those lands?

Response: The Port is encouraging Port ancillary uses including truck parking in the Oakland Army Base property. Both the Port and the City of Oakland are committed to providing 15 acres of land in the OAB for truck facilities. The Port is currently providing

truck parking at the former OAB property at an interim location, while demolition of the buildings is taking place. The future location of the Port-designated 15-acre parcel is adjacent to the City's 15 acres and would allow for development of a super efficient trucking operation. The Port is actively working with the City on issues related to truck parking and related support services.

Comment B-3:
What percentage of total Bay Area diesel load does West Oakland "own"? The Port, maze, Nimitz toll plaza, etc. all contribute to the West Oakland share, making it more obvious, than in other communities; if parity is an issue, West Oaklander's need to understand what their percentage of the total is, as compared to other communities.

Response: The comment is outside of the scope of the document that was prepared by the Port of Oakland. The inventory was developed to assist the Port in preparing the Maritime Air Quality Improvement Plan and for input into the health risk assessment (HRA) being prepared by the ARB. Comparing emission inventories prepared with different methodologies can often be misleading as values are not directly comparable. See response to comment F-1. The HRA will provide an answer to what risk is posed to the community by West Oakland DPM sources above the Bay Area "background" DPM risk. Currently the District and the Bay Planning Coalition and its members are planning to address the attribution question for the case of the Port of Oakland (Port/District), but the timeframe for this is still uncertain.

Comment C: **Margaret Gordon,**
Oral Comment provided during the August 21, 2007 public meeting in West Oakland.

Comment B-3:
Emissions from Port construction projects in 2005 should be included in the Emissions Inventory.

Response: The estimate of 2005 emissions from construction at the Port of Oakland is currently being prepared by ENVIRON International Corporation to respond to this comment. The results of the construction emissions estimate will be presented in a separate attachment to the Emissions Inventory to be posted on the Port website in the future.

Letter D: **Jack P. Broadbent, Executive Officer/APCO**
Bay Area Air Quality Management District
See letter dated 8/24/2007, page 13

Comment D-1:
The Commentor listed several concerns with the Table 3 in the Emissions Inventory Overview document, a table that compares diesel particulate emissions from the Port of Oakland with emissions from other west coast ports and from the Bay Area region.

Response: The Port deleted Table 3 from the Overview document.

Comment D-2: Several Comments on the Overview Document

- The Port needs to clarify that the Emissions Inventory will help prioritize emission reduction and the Health Risk Assessment will prioritize reduction in local exposure and risk.

  Response: Text in introductory paragraph was modified.

- There is a reference to 30 nautical miles to the buoy in the *What is an Emissions Inventory?* section. District believes correct distance is 11 nautical miles from the coast.

  Response: Text was modified to clarify that the emissions estimates include vessel transit to the buoy located approximately 25 nautical miles from the Port and approximately 11 nautical miles from the coast. Table 2-4 in the Emissions Inventory report shows the distance between the berths and the buoy.

- In the *What is an Emissions Inventory?* section, it would be helpful to include reference to more information on each pollutant and their roles in air quality issues.

  Response: Text was inserted directing the reader to Section 1, Introduction, in the Emissions Inventory report, which describes each pollutant.

- In the *How are Emissions Measured?* section, it would be helpful to list the level of activities, the number of vessel calls, vehicle mile traveled of trucks, etc.

  Response: A table containing the level of activities was included in the Overview.

Comment D-3:

The inclusion of total organic gases (TOG), in addition to reactive organic gases (ROG), would facilitate a green house gases (GHG) inventory.

Response: Comment noted. The Port has taken a voluntary first step and prepared a GHG inventory for its own operations, including electrical use and fleet fuel use. Per AB32, GHG reporting is only required of *significant sources*, which at the moment does not include ports. The protocol requires tracking of CO2, CH4, N2O, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

Letter E: **John Berge, Vice President**
Pacific Merchant Shipping Association
See letter dated 8/24/2007, page 16

Comment E-1:

The water domain for the emissions inventory study did not connect with any jurisdictional boundary. The domain used in the estimation of emissions from harbor craft extends beyond the activity immediately at the port. Land domain for trucks and trains did not extend beyond Port area. This disparity in spatial boundaries provides a misleading picture of relative contribution from each source category.

Response: The domain for the study was defined to include the activity that could be defined and well understood, and was not necessary associated with a spatial area. The routes for large ships could be defined to the outer buoys, but outside of those buoys the routes become less well defined. Harbor craft activity was defined only for the activity

demanded by the Port traffic. Truck and locomotive activity was limited to the area immediately adjacent to the Port and included some traffic on public streets. Beyond the area defined, it is difficult to determine the traffic demanded by the Port activity beyond this immediate area. Also, see response to comment G-1.

Comment E-2:
Why are berthing emissions the largest ship emission source in the inventory? We strongly suggest that the final version of the Port of Oakland emissions inventory include the average ship berthing times in Oakland, a direct comparison of transiting, maneuvering, and berthing with those in San Pedro and Puget Sound ports.

Response: Berthing emissions in the Port Emissions Inventory are not the largest OGV ship emission source and are comparable with the San Pedro Bay and Puget Sound ports inventory. The proportion of berthing to all OGV emissions is relatively similar in all three studies, ranging from 20 to 35% for NOx and PM. Both the Port of LA and Puget Sound studies prepared by Starcrest combine the cruise and reduced speed zones (RSZ) in one transiting emission total, unlike the Port of Oakland study which separates them. That may have caused confusion about the relative importance of the berthing mode emissions in Oakland. The Puget Sound ports include an extremely long transit mode ranging more than 100 nautical miles from port. The Port of LA study includes transiting mostly in the high power demand cruise mode about 40 nautical miles from the port, similar to the Port of Oakland analysis methodology, which estimates emissions from the berths to the outer buoy located just beyond the Sea Buoy, approximately 25 nautical miles from the berths.

The average ship berthing time at the Port of Oakland is 20.7 hours. This figure has been added to page 2.4 in the report.

The inclusion of a consistent comparison among ports in different regions will require a careful assessment of the methodologies used to estimate emissions from these ports, an effort which is beyond the scope of work of the Port emissions inventory effort. See Comment D-1 from the BAAQMD.

Comment E-3:
The ocean-going marine vessel discussion on page ES-3 should mention that the Port of Oakland is almost exclusively container operations and that cruise ships, liquid and dry bulk vessels are not included in this inventory. Further, if there are any vessels and harbor craft emissions associated with vessels that don't call at the Port of Oakland currently included in the inventory, they should be removed.

Response: The fourth paragraph on Page ES-2 says "...the Port of Oakland operated almost exclusively as a container port in 2005." Text was added on page ES-3, as suggested, re-stating that the Port Emissions Inventory accounts for the operation of container vessels only. All vessel and harbor craft emissions estimates in the report are associated with activities at the Port.

Comment E-4:
"Tables 2-6 and 2-7 show auxiliary engine loads at 45 to 50 percent for transiting and maneuvering, and from 17 to 26 percent while at berth, which is not accurate. We are sure you meant to describe use of installed power since most vessels have multiple auxiliary engines that run at or near optimal loads and are either augmented by additional engines

when more auxiliary power is needed or shut down when less power is required. This distinction between installed power versus load should be made to avoid confusion that could result from the discussion of low Load Adjustment Factors (page 2-12 to 2-14), that does not apply to auxiliary engines as mentioned at the very end of that discussion."

Response: While it might be more clear to describe in Tables 2-6 and 2-7 that auxiliary engine loads apply to all of available auxiliary engines power summed together and not to each individual engine, an explanation saying that typically each vessel has a set of three or more auxiliary engines to provide auxiliary power was included on page 2-14 of the report. The choice of the order of the discussion was chosen because auxiliary emissions during transit and maneuvering is small compared to the propulsion engine emissions. Therefore any confusion about not applying the low load adjustment factors for auxiliary engines is a minor consideration.

Comment E-5:

"The fuel consumption methods used by ENVIRON results in emissions estimates that are approximately 40% less than the default engine load method used by CARB. We hope that when the health risk assessments are completed they will consider these differences as another measure of the uncertainty of emissions inventories and the need to constantly update those methods and emission factors to better understand the impacts on public health."

Response: Comment noted. Future updates of the inventory will take into consideration new methods and emission factors, as appropriate.

Comment E-6:

"There have been a number of air quality initiatives and regulations that have been implemented subsequent to the 2005 baseline year that we believe should at least be qualitatively discussed to demonstrate that there are continuous improvements to air emissions from the ports."

Response: A report is currently being prepared by ENVIRON reviewing current and proposed rulemakings that would affect each Port emission category in the future. A Future Year Emissions Inventory Projections for the Port of Oakland Seaport is also being prepared and takes into account the regulatory changes. The Future Year Projection will be attached to the Port of Oakland Maritime Air Quality Improvement Plan (MAQIP).

Comment E-7:

"The inventory should also commit to future updates to monitor and report on the changes to air emissions from the Port and goods movement sources."

Response: The Port will update the inventory as needed, but no less than every five years. All of the CARB rules governing emissions from goods movement sources contain monitoring and reporting provisions and the Port will comply as applicable.

Letter F: **Michael Stanfill, Manager Environmental Program Development**
Burlington Northern Santa Fe
See e-mail dated 8/29/2007, page 20

Comment F-1:
It is helpful to include a comparison with other Ports, like was provided in the Overview document.

Response: Because of inconsistencies among the studies' methodologies, the comparison included in the draft Overview document was deleted from the final version of the document. As discussed in the answer to Comment E-2, a consistent comparison among ports in different regions will require a careful assessment of the methodologies used to estimate emissions from these ports, an effort which is beyond the scope of work of this emissions inventory effort. See Comment D-1 from the BAAQMD.

Comment F-2:
Section 6.2 should clearly state that the Oakland International Gateway (OIG) is an intermodal railyard.

Response: Text in Section 6.2 was modified and it now states that OIG is an intermodal railyard.

Comment F-3:
Section 6.3 should be modified, as suggested.

Response: Section 6.3 was modified to clarify the type of operations that are conducted at the OIG.

Comment F-4:
Section 6.3.A (Basic Locomotive Refueling) should be modified. The word "used" is incorrect and the correct word should be "dispensed".

Response: Section 6.3.A was modified to clarify that the fuel is dispensed at the OIG.

Comment F-5: Section 6.3.A (Basic Locomotive Refueling) should be modified to clarify that some engines at the OIG are owned by other railroads (such as CSX or Norfolk Southern) and are operated by BNSF through cooperative agreements.

Response: Section 6.3.A was modified as suggested.

Letter G: **Margaret Gordon, Swati Prakash, John Brauer, Doug Bloch and others**
Coalition for Clean and Safe Ports
See letter dated 8/20/2007, page 21

Comment G-1:
"We believe that the Seaport Emissions Inventory is flawed in regards to Port trucks." It significantly underestimates the emissions and air pollution from port trucks and thus significantly underestimates the Port of Oakland's total contribution to regional air pollution. "As the Port moves to implement policies to reduce maritime emissions, we

believe that it's critical that the Port have an accurate emissions inventory to properly prioritize mitigation measures and assess their effectiveness.

Response: We do not consider the inventory flawed in regards to Port truck emissions. With regard to truck travel distance, the routes and mileage for trips to and from the Port are not defined as precisely as ships are. Therefore, the scope of the inventory only includes the activity that could be accurately and precisely determined.

The emissions inventory methodology, agreed to by ENVIRON, CARB, the BAAQMD, and the Port, presents an estimate of Port-related truck emissions within the Port's area. These are the truck emissions that could be accurately and precisely determined, and therefore scientifically defensible. The methodology did not require the inventory to estimate emissions from truck trips beyond the Port area boundary due to the difficulty and cost of collecting accurate information on emissions from truck trips beyond the Port area boundaries. However, the Port received several comments asking that a percentage of the truck emissions outside the Port area be attributed to the Port. CARB is working to develop this percentage, which will help provide a broader picture of the impact of Port truck emissions on the surrounding neighborhoods and within the larger air basin.

Comment G-2:

"The Emissions Inventory significantly underestimates the emissions and air pollution from port trucks. This has two primary effects on the results of the Inventory:
1. The Inventory underestimates the total air pollution and emissions produced by the Port of Oakland's maritime activities, and;
2. The Inventory underestimates port trucks' contribution to specific air pollutants, especially particular matter (PM), nitrogen oxides (NOx), and reactive organic gases (ROG)."

Response: See response to Comment G-1 above.

Comment G-3:

The inventory only considers Port truck emission from each of the marine terminals to each of three freeway interchanges and two rail yards. "The Inventory does not consider port truck emissions from port trucks operations within the West Oakland community or from port trucks operating on freeways moving to and from their destinations throughout the San Francisco Bay Area."

Response: See response to Comment G-1 above.

Comment G-4:

The methodology used to estimate port truck emissions is inconsistent with that of the Port of Los Angeles and Long Beach's Clean Air Action Plan and with the "Ships" portion of the Seaport Emissions Inventory. The Port of Oakland must use a comparable methodology for port trucks operating to and from its facilities. This would mean that the Emissions Inventory would include emissions from all operations to and from the Port of Oakland at least within the San Francisco Bay Air Basin.

Response: See response to Comment E-1 and G-1 above.

Comment G-5:

The Commentor urges the Port to issue an Addendum to the Emissions Inventory stating that the Inventory underestimates emissions form port trucks because it does not include

their emissions from operations in West Oakland or along the freeways within the SF Bay Area. The Port should update the Seaport Emissions Inventory to include the CARB's emissions data on port truck operations within West Oakland.

Response: The emissions inventory methodology, agreed to by ENVIRON, CARB, BAAQMD, and the Port did not require the inventory to estimate emissions from truck trips beyond the Port area boundary, for the reasons described in response to comments E-1, G-1 and G-4.

However, the Port received several comments asking that a percentage of the truck emissions outside the Port area be attributed to the Port. CARB is working to develop this percentage, which will help provide a broader picture of the impact of Port truck emissions on the surrounding neighborhoods and within the larger air basin. CARB will attribute these emissions to the Port in the HRA being prepared for the West Oakland community.

Comment G-6:

The Commentor urges the Port to conduct a destination survey of the port truck fleet in order to estimate total emission from port trucks within the SF Bay Air Basin.

Response: A truck origin/destination survey is a complex endeavor beyond the scope of the Emissions Inventory. The emissions inventory methodology, agreed to by ENVIRON, CARB, the BAAQMD, and the Port, presents an estimate of Port-related truck emissions within the Port's area. These are the truck emissions that could be accurately determined, and are therefore scientifically defensible.

The Port recognizes the importance of quantifying emissions of all goods movement-related activities, including trucking, within the SF Bay Area Air Basin and the State of California. We will continue to collaborate with CARB and the BAAQMD as they further study trucking emissions locally and throughout the State.

ATTACHMENT 1

Comment Letters Received

on the Review Copy of the Port of Oakland

2005 Seaport Emissions Inventory Report

List of Comments

A.	8/16/07 12:01 PM	SF Bar Pilot, Kenny Levin	E-mail from k.levin@sfbarpilots.com
B.	8/21/07	Public Comment Form	provided to Port Staff by Steve Lowe during the August 21, 2007 meeting
C.	8/21/07	Margaret Gordon's oral comment regarding impacts from Port construction in 2005 provided during the August 21, 2007 Public Meeting	
D.	8/24/07	Bay Area Air Quality Management District, Jack Broadbent, 3-page letter	
E.	8/24/07 11:28 AM	PMSA, John Berge	E-mail from JBerge@pmsaship.com, 4-page PDF letter
F.	8/29/07 12:37 PM	BNSF, Michael Stanfill	Michael.Stanfill@bnsf.com 1-page e-mail
G.	8/29/07 2:46 PM	Coalition for Clean and Safe Ports	doug.bloch@changetowin.org 2-page PDF letter

Comment Letter A

Comments from the San Francisco Bar Pilots

>>> Delphine Prevost 8/16/2007 12:45 PM >>>
I received these comments on the emissions inventory. Mr. Levin did not want to use the web submittal because he wanted to cc a seaport business rep, Mr. Blanckenburg. Here are his comments for your compilation during the review/comment period.

Delphine Prévost
Air Quality Program Coordinator
Port of Oakland

>>> "Kenny Levin" <k.levin@sfbarpilots.com> 8/16/2007 12:01 PM >>>
Delphine:
I trust you'll forwarded this to whoever needs to know: Bottom line of our review - the inventories a pretty impressive piece of work.

The report on Port of Oakland 2005 Seaport Air Emissions Inventory was reviewed by the San Francisco Bar Pilots from the perspective of vessel navigation and basic vessel operations. Our comments:

1. Page ii, Definitions: "Pilot Buoy" should be replaced with "Sea Buoy". This terminology obviously does not affect the results of the inventory but the buoy is known as the sea buoy to mariners. This replacement should be made throughout the text. A-1

2. Page 2-4, third paragraph, first line: We believe the word "engine" should be replaced with "engine power" or similar term. A-2

3. Page 2-7, Table 2-4: The table shows the vessel speed at 10 knots when the pilot boards at the sea buoy (table uses the term "Pilot Buoy", see comment 1. above.). It should be noted that this speed reduction to 10 knots is only when transferring the pilot, as soon as the pilot is aboard, the vessel will likely return to a higher speed such as cruise speed. We assume the model took this fact into account. If not, it should be corrected. A-3

4. Page 2-10, Auxiliary Power and Load: The assumptions made based on the information in Appendix C are sound and prudent. A-4

Although not within our expertise, the relatively large percentages of emissions from ships while at berth caught our attention. We assume that the hip operators or their representatives, who have more expertise in this area, will comment, especially on page ES-6, Table ES-2.

In general, the inventory seems well thought out and well presented. Our comments are minor.

Kenny Levin
Business Director
San Francisco Bar Pilots
415.362.1038
415.982.4721

Comment Letter B

REQUEST FOR PUBLIC COMMENTS & QUESTIONS

PORT OF OAKLAND 2005 SEAPORT AIR EMISSIONS INVENTORY

As part of its longstanding commitment to help reduce air pollution, the Port of Oakland released its 2005 Seaport Air Emissions Inventory for public review and comment on August 8, 2007. This Inventory estimates the amounts of certain types of air pollutants generated by the ships, trucks, trains, harbor craft, and cargo handling equipment at the Port of Oakland during 2005.

The Inventory will:

- Allow the Port of Oakland to more accurately understand emissions sources related to seaport activities;
- Help the Port, its tenants and the community prioritize emissions reduction efforts;
- Provide the Port and the community a baseline of emissions for tracking progress in reducing pollution.
- Assist the Maritime Air Quality Improvement Plan Task Force develop a Maritime Air Quality Improvement Plan for the Port of Oakland; and
- Provide the data for Part One of the California Air Resources Board West Oakland Health Risk Assessment, due in late 2007.

Members of the public are encouraged to read and comment on the Port of Oakland's Seaport Air Emissions Inventory at our website www.portofoakland.com and submit any comments or questions on this form or through our website by Friday, August 24, 2007.

COMMENTS & QUESTIONS ON THE PORT OF OAKLAND 2005 SEAPORT AIR EMISSIONS INVENTORY:

(1) WHAT IMPACT DO/DID AREA AIR QUALITY WILL THE PORT'S CARGO OPERATIONS HAVE SHOULD THAT ANTICIPATED SYSTEM BE EMPLOYED?

(2) IF A RECONFIGURATION OF ARMY BASE LANDS WILL ENCOURAGE THE MAJORITY OF WEST OAKLAND'S TRUCKING FIRMS TO CONSOLIDATE INTO A NEW, SUPER EFFICIENT TRUCK-FRIENDLY FACILITY (AND THEREFORE REDUCE EMISSIONS SIGNIFICANTLY) WHY WOULD THE PORT NOT ENCOURAGE SUCH A HIGHER & BETTER USE OF THOSE LANDS?

(3) WHAT PERCENTAGE OF TOTAL BAY AREA DIESEL LOAD DOES WEST OAKLAND "OWN"? THE PORT, MARK, KINDER MORGAN, TOLL PLAZA ETC. ALL CONTRIBUTE TO THE WEST OAKLAND SHARE, MAKING IT MORE OBVIOUSLY, THAN IN OTHER COMMUNITIES; IF PARITY IS AN ISSUE, WEST OAKLANDERS NEED TO UNDERSTAND WHAT THEIR PERCENTAGE OF THE TOTAL IS, AS COMPARED TO OTHER COMMUNITIES.

B-1

B-2

B-3

From Steve Lowe, V.P., West Oakland Commerce Association
August 21, 2007 Public Meeting

Please mail this form to the address listed on the reverse
or FAX to (510) 465-3755 Attn: Marucia Britto
You may also submit comments directly through our website at www.portofoakland.com.

Comment Letter D

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
SINCE 1955

August 24, 2007

Ms. Marucia Britto
Port of Oakland
530 Water Street
Oakland, CA 94607

RE: 2005 Seaport Air Emissions Inventory

Dear Ms. Britto:

Thank you for the opportunity to provide comments on the draft 2005 Seaport Air Emissions Inventory. The draft inventory has been presented in three parts – an "Overview" prepared by Port of Oakland staff, an "Executive Summary" prepared by Environ, consultant to the Port, and the "Inventory." We have a few minor comments on the inventory itself; however, we have serious concerns regarding portions of the "Overview" document prepared by Port staff.

In particular, we are concerned about Table 3 "Seaport % of Region's Total Diesel Particulate Matter," and the accompanying discussion. We urge the Port to either remove or extensively modify Table 3 from the "Overview" document. The current comparisons provided in Table 3 do not clearly and accurately describe the Port of Oakland's contribution to regional diesel particulate matter (DPM) emissions. The inclusion of a consistent comparison among regions and to a regional emissions total will require a more careful assessment than currently provided in the overview document.

Much of our concern stems from the significant differences in what was inventoried for each of the west coast ports compared in Table 3. Specifically,

- For the total DPM in the Bay Area, the estimate of ship emissions extends out to 100 nautical miles (nm) from the coast; whereas, the Port inventory extended out approximately 11nm from the coast to the pilot buoy. The comparison should use a consistent geographic area. D-1

- The inventory attributed to Puget Sound ports includes all maritime sources, not just those associated with a specific port (for example, ferries were included in the Puget Sound inventory). The Port of Oakland is only slightly busier in terms of container traffic than each of the three main Puget Sound ports. The Puget Sound ports also have robust bulk facilities that the Port of Oakland does not have; our region's bulk products are handled by the maritime facilities in Richmond, Benicia, San Francisco and Redwood City. A more useful comparison would be the emissions from the Port of Oakland's and the Port of Seattle's container business to their respective region's total basin-wide emissions.

Spare the Air

- In Table 3, the San Pedro Bay ports are listed as contributing 23% of the of the diesel particulate matter emissions in the South Coast Air Basin. While this number may indeed be accurate, the San Pedro Bay Ports' *Clean Air Action Plan* states the Los Angeles and Long Beach ports contribute 12% of the South Coast Air Basin total diesel PM. This disparity in numbers from different reputable sources highlights the caution needed in making any interregional comparisons.

- Also, note that Table 3 indicates diesel PM, but Table1 and the accompanying pie chart indicate total PM. This will need to be clarified for all the listed comparison ports if Table 3 remains in the overview or the full Inventory report.

D-1 continued

In addition to the concerns listed above, we have some additional comments that we believe will improve the draft inventory documents.

- In the opening section, the overview states that the inventory itself and the HRA are to be used to prioritize emission reductions/"air quality investments." It would be helpful to note that the inventory will be helpful in prioritizing overall emission reductions to reduce regional pollution, and that the HRA will help prioritize efforts to reduce local exposure and risk. It is important to note the distinction since the sources controlled to reduce overall emissions most cost-effectively may not be the same sources contributing the most risk to residents. We need to reduce emissions to improve regional air quality and to improve air quality in West Oakland.

- In the section "What is an emissions inventory?" reference is made to ship emissions being tracked to 30 miles to the pilot buoy. We believe the correct distance is 11 nm from the coast. Additionally, this section lists the pollutants of concern studied in the inventory. A reference to a section in the report or an online resource for the reader to learn more about the pollutants and their role in air quality issues would be useful.

D-2

- In the section "How are emissions measured?"(p. 3), it would be helpful to have a listing of some of the activity levels to help put in context the emissions numbers provided in Table 1. For instance, the number of vessel visits, VMT of trucks, number of cargo handling equipment in use, etc. If this information is provided in the body of the inventory report, then a direct reference should be provided for the reader's benefit.

- The inclusion of Total Organic Gases (in addition to ROG) would facilitate a greenhouse gas inventory.

D-3

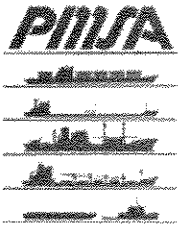
Thank you, again, for the opportunity to comment on the draft Seaport inventory. The Air District applauds the Port of Oakland's efforts to carefully estimate Port emissions, and we look forward to working together to reduce the emissions as promptly and cost-effectively as possible. Please contact Dr. Phil Martien at 415/749-4660 if you have any questions regarding these comments or wish to discuss alternative comparisons of the Port of Oakland's emissions either to region-wide emissions for the San Francisco Bay Area or to other major maritime ports along the western coast of North America.

Sincerely,

Jack P. Broadbent FOR
Executive Officer/APCO

cc: Omar Benjamin, Executive Director, Port of Oakland
Dan Donahue, California Air Resources Board

Comment Letter E



August 24, 2007

Emissions Inventory
C/O Ms. Roberta Reinstein
Manager, Environmental Health and Safety Dept.
Port of Oakland
530 Water Street
Oakland, CA 94607

Subject: Comments on the "Port of Oakland 2005 Seaport Air Emissions Inventory"

Dear Ms. Reinstein:

The Pacific Merchant Shipping Association appreciates the opportunity to provide comments on the "Port of Oakland 2005 Seaport Air Emission Inventory". The PMSA represents approximately ninety percent of all containerized cargo that moves through California Ports.

We commend the Port for proactively moving forward with the quantification of emissions from maritime and goods movement sources. Inventories, and especially those repeated over time, are essential development tools for measuring the progress of programs and policies. PMSA has had experience in reviewing emissions inventories from Los Angeles, Long Beach and the Pacific Northwest. In those other inventories we noticed a number of reoccurring issues of concern that we also see in your inventory. We hope you will address these issues, not just for consistency with the other inventories, but in anticipation of your next inventory to allow for better monitoring of changes over time. These comments generally relate to geographical boundaries of the inventory and consistent methods to calculate ship and cargo handling equipment emissions.

Thank you for the opportunity to comment on the preliminary report. We hope these comments will provide useful guidance to the California Air Resources Board (CARB) in the subsequent drafts. If you have any questions or wish to discuss our comments further, please feel free to contact me by phone at (415) 352-0710 or e-mail at jberge@pmsaship.com. In addition, Mr. T.L. Garrett with PMSA has worked closely with me on developing these comments. He can be reached by phone at (562) 377-5677 or by e-mail at tgarrett@pmsaship.com.

Sincerely,

John Berge

John Berge
Vice President

Pacific Merchant Shipping Association, 250 Montgomery Street, Suite 700
San Francisco, California 94104
Phone: 415-352-0710, FAX: 415-352-0717

General Comments on the Review Copy
of the Port of Oakland 2005 Seaport Air Emissions Inventory

Geographical Extent of the Inventory

In our review of the inventory several inconsistencies concerning the geographical extent of the inventory were noted. The over-water boundary for ocean going vessels, while disclosed, was not connected with any jurisdictional boundaries and included as port emissions. For harbor craft, the actual geographic boundary was vaguely defined based on average transit and operating times and extends well beyond the activity immediately at the port. For the landside sources we believe that, as part of the goods movement system, emissions from trucks and trains that are connected to port operations should be included in the inventory, yet the spatial boundary for truck emissions only extends a short distance (about 1.5 miles) from the terminals and the boundary for train emissions does not extend beyond the rail yard fence. We pose the question as to why such disparate spatial boundaries were chosen in developing the methodology of the inventory. We would suggest that the inventory be separated into the regional Bay Area Air Quality Management District Boundaries (BAAQMDB) and the Port of Oakland jurisdictional boundaries. The rationale for these boundaries is they would be consistent with the modeling domain of the BAAQMD for the California State Implementation Plan and also provide a better means of determining the relative contribution of goods movement sources in the BAAQMDB. The subset jurisdiction boundary of the Port of Oakland would provide for a better comparison with other port authorities such as the San Pedro and Puget Sound Ports and also provide a better measure of air quality changes most directly under the control of the Port of Oakland. This would also provide a more equitable picture of relative source contributions as opposed to the heavily skewed perspective given by the draft inventory, where the over water geographical boundary for ocean going vessels is about 15 – 20 times that of trucks and trains. To emphasize this disparity, we have attached a diagram (figure 1) of a geographical boundary around the Port of Oakland with a circumference based on the boundary distance (30 miles) used for ocean going vessels. This diagram indicates the huge disparity in spatial domains used for different mobile sources. We understand that, as a precursor to developing a health risk assessment, much of the disparities in spatial boundaries become moot. None the less, they provide a misleading picture to the general public regarding relative contributions from each source category.

E-1

Ship Berthing Time Emissions

We would like to see much more detail supporting Table ES-2 in the final version of the report. The table shows that emissions at berth are the largest ship emissions source in the inventory. This is contrary to the findings of emissions for both the San Pedro Bay (POLA 2004) and Puget Sound (PSMAF 2007). For the 2001 baseline year the Los Angeles Inventory showed berthing emissions were less than 30% of ship emissions within the South Coast Air Basin (SCAB). Further, in Los Angeles the average berthing times were in excess of 50 hours while at the Port of Oakland we would believe the average berthing times in Oakland to be below 20 hours but could find no data in this review draft to validate the numbers. Therefore, in the final version of the report we strongly suggest that average berthing times be disclosed and a direct comparison of transiting, maneuvering, and berthing be compared with the San Pedro Bay and Puget Sound port is a simple table to help the reader understand how the differences in operations at the various West Coast ports influence their emissions profiles.

E-2

Port of Oakland Ship Profiles

In the discussion of Ocean-going Marine Vessels on page ES-3, there should be some mention that the Port of Oakland is almost exclusively container operations and that cruise ships, liquid and dry bulk vessels, while present in the Bay, are not included in this inventory. Further, if there are any vessels and harbor craft (e.g. tug assist) emissions associated with vessels that don't call at the Port of Oakland currently included in the inventory they should be removed for consistency. E-3

Ship Auxiliary Emissions

Tables 2-6 and 2-7 show auxiliary engine loads at 45 to 50 percent for transiting and maneuvering, and from seventeen to twenty-six percent while at berth, which is not accurate. We are sure you meant to describe use of installed power since most vessels have multiple auxiliary engines that run at or near optimal loads and are either augmented by additional engines when more auxiliary power is needed or shut down when less power is required. This distinction between installed power versus load should be made to avoid confusion that could result from the discussion of Low Load Adjustment Factors (page 2-12 to 2-14), that does not apply to auxiliary engines as mentioned at the very end of that discussion. E-4

Cargo Handling Equipment

What really sticks out from this section and is summarized in Table 7-1, is how the use of different assumptions and emission calculation methodologies can result in very different results. The fuel consumption methods used by Environ results in emissions estimates that are approximately 40% less than the default engine load method used by CARB. We hope that when the health risk assessments are completed they will consider these differences as another measure of the uncertainty of emission inventories and the need to constantly update those methods and emission factors to better understand the impacts on public health. E-5

Sensitivity Assessment

There have been a number of air quality initiatives and regulations that have been implemented subsequent to the 2005 baseline year that we believe should at least be qualitatively discussed to demonstrate that there are continuous improvements to air emissions from the ports. Notably the ultra-low sulfur fuel requirements for on-road trucks, cargo handling equipment and harbor craft have been implemented since 2005. There has been the implementation of the Cargo Handling Equipment Regulation by the California Air Resources Board (CARB) that will result in the accelerated turnover of equipment at the Port. There has also been the implementation of the Auxiliary Engine fuel requirement by CARB in January 2007 and the ongoing implementation of IMO Annex VI engine requirements that went into force in May 2006 and are retroactive to ships built after January 1, 2000. There have also been demonstration projects on the use of an on-board fuel emulsifier and a shore-side clean power generator by an operator at the Port of Oakland. These could be mentioned as part of the on-going commitment by the maritime industry to reduce emissions from these sources. Finally, the inventory should also commit to future updates to monitor and report on the changes to air emissions from the Port and goods movement sources. E-6 E-7

References

Final Draft, Port-Wide Baseline Air Emissions Inventory, Prepared for the Port of Los Angeles by Starcrest Consulting Group, LLC. June 2004.

Puget Sound Maritime Air Emissions Inventory, Prepared for the Puget Sound Maritime Air Forum by Starcrest Consulting Group, LLC. April 2007

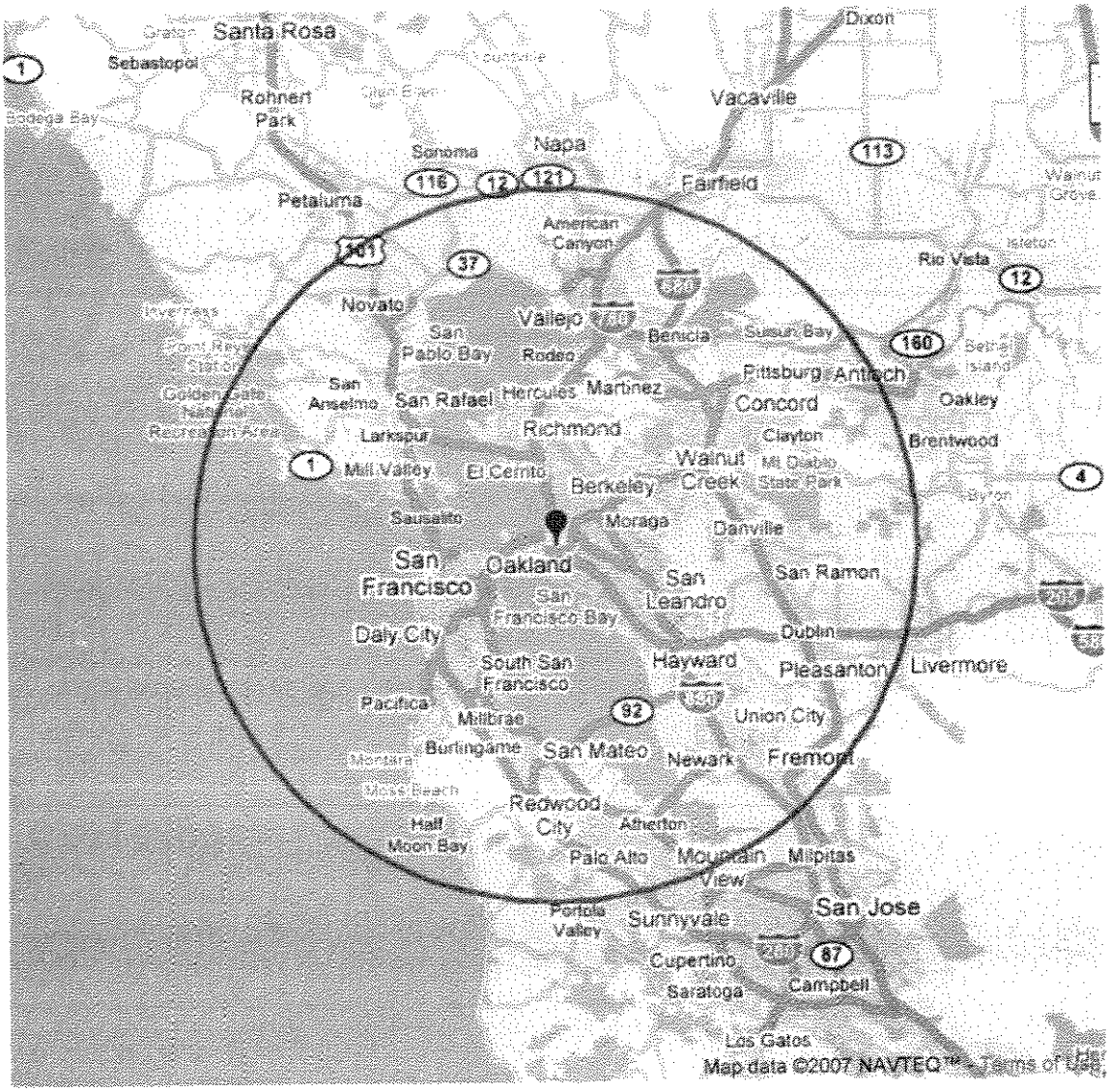


Figure 1 - 30 mile circumfrence from Port of Oakland based on spatial domain boundary for ocean going vessels.

Comment Letter F

Comments from BNSF

>>> "Stanfill, Michael G" <Michael.Stanfill@bnsf.com> 8/29/2007 12:37 PM >>>
I was on vacation last week but wanted to submit some comments on the Port of Oakland Inventory. With this being late I was going to email through the link on the Port's web page but it drops some of my formatting. Could you forward this on to the correct people?

Mike Stanfill
Manager Environmental Program Development
785-435-2269 office
785-221-5744 cell

Including the comparisons of the Port of Oakland's emissions with other Ports in the overview document is helpful to keep everything in perspective. We do think it is important in these types of documents to show comparisons to "like" types of industries or activities. It was done well and in a way that does not minimize the Port of Oakland results. F-1

Within the "complete" document we have some suggestions to help clarify or correct some items.

1. We think section 6.2 should clearly state that OIG is an intermodal railyard. This section does not use the term "intermodal" and for clarity sake it should. F-2
2. Change the second sentence of the first paragraph of section 6.3 as follows: F-3
   "~~Even though~~ Locomotive load testing and maintenance ~~are routine services often conducted in rail yards, they~~ do not occur at the OIG.
3. In the first paragraph of section 6.3.A (Basic Locomotive Refueling) on page 6-8, the first sentence indicates that "1,762,003 gallons of fuel were used at the OIG." The word "used" is incorrect and the correct word should be "dispensed". Perhaps change the first line as follows: F-4
   "… 1,762,003 gallons of fuel were ~~used~~ dispensed in 2005 at the OIG with an…."
4. The second paragraph on page 6-8 indicates "Some of engine model types could not be identified because some engines were originally, or are currently, owned by other railroads (such as CSX or Norfolk Southern) and are leased by BNSF". These foreign locomotives are not necessarily leased by BNSF but often are part of variety cooperative operating agreements. I would suggest it be changed as follows: "Some of engine model types could not be identified because some engines ~~were originally, or~~ are ~~currently,~~ owned by other railroads (such as CSX or Norfolk Southern) and are ~~leased~~ operated by BNSF through cooperative agreements." F-5

Comment Letter G

COALITION FOR CLEAN & SAFE PORTS

Via E-mail, Facsimile, and U.S. Mail

August 20, 2007

Omar Benjamin
Executive Director
Port of Oakland
530 Water Street
Oakland, CA 94607

Dear Mr. Benjamin,

These comments are submitted on behalf of the Coalition for Clean and Safe Ports. While the Seaport Emissions Inventory is an important first step by the Port of Oakland to understand and reduce the impacts of its maritime activities, we believe that the Inventory is flawed in regards to port trucks. **The Seaport Emissions Inventory significantly underestimates the emissions and air pollution from port trucks and thus significantly underestimates the Port of Oakland's total contribution to regional air pollution.** As the Port of Oakland moves to implement policies to reduce maritime emissions, we believe that it's critical that the Port have an accurate emissions inventory to properly prioritize mitigation measures and assess their effectiveness. G-1

The Coalition for Clean and Safe Ports is a broad coalition of environmental, labor, faith, and community organizations promoting sustainable economic development at the Port of Oakland. We are working to clean up the port trucking industry, reduce environmentally harmful port emissions, stimulate greater economic opportunities for Oakland's residents, and establish accountability to communities surrounding the Port. Our coalition includes ACORN, Change to Win, East Bay Alliance for a Sustainable Economy, East Bay Community Law Center, Interfaith Committee for Worker Justice, International Brotherhood of Teamsters, Natural Resources Defense Council, Pacific Institute, West Oakland Environmental Indicators Project, Oakland Workforce Development Collaborative, and over 20 additional organizations.

Analysis

The Port of Oakland released a 2005 Seaport Air Emission Inventory on August 10, 2007. The stated purpose of the Inventory was to estimate the amounts of certain types of air pollutants generated by ships, trucks, trains, harbor craft, and cargo handling equipment in the course of maritime operations during 2005. The Port states that the emissions inventory will be used to inform the Maritime Air Quality Improvement Plan (MAQIP) process and the West Oakland Health Risk Assessment being carried out by the state and regional air quality agencies.

While the Seaport Emissions Inventory is an important first step by the Port of Oakland to understand and reduce the impacts of its maritime activities, we believe that the Inventory is flawed in several ways. The Emissions Inventory significantly underestimates the emissions and air pollution from port trucks. This has two primary effects on the results of the Inventory: G-2

155 Myrtle Street, Oakland, CA 94607
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1. The Inventory underestimates the total air pollution and emissions produced by the Port of Oakland's maritime activities, and;
2. The Inventory underestimates port trucks' contribution to specific air pollutants, especially particulate matter (PM), nitrogen oxides (NOx), and reactive organic gases (ROG).

G-2 continued

Flawed Methodology

The Seaport Emissions Inventory underestimates emissions and air pollution from port trucks because it only measures port truck emissions within a small area of their activity. The Inventory only considers port truck emissions on truck routes from each of the marine terminals to each of three freeway interchanges (those closest to terminal gates at the Port) and two rail yards. **The Inventory does not consider port truck emissions from port trucks operations within the West Oakland community or from port trucks operating on freeways moving to and from their destinations throughout the San Francisco Bay Area.** This methodology is inconsistent with that of the Ports of Los Angeles and Long Beach's Clean Air Action Plan and with the "Ships" portion of the Seaport Emissions Inventory.

G-3

Unlike the Port of Oakland's Emissions Inventory, the Clean Air Action Plan (CAAP) considers port truck emissions within a much larger area of their activity. In the CAAP, trucks emissions are measured within the entire South Coast Air Basin from Ports to the first time the cargo is off-loaded. We believe that the Port of Oakland must use a comparable methodology for port trucks operating to and from its facilities. This would mean that the Emissions Inventory would calculate their emissions from all their operations to and from the Port of Oakland at least within the SF Bay Air Basin.

G-4

Furthermore, the port truck methodology is inconsistent with how ships' emissions are calculated in the Inventory. Ships' emissions are calculated from the Pilot Buoy, 30 miles away from the Port, to the dock. This methodology appropriately takes into consideration the movement of the ships within the region and estimates their emissions accordingly. We urge the Port to follow this logic through to its estimates of port truck emissions by accounting for their movement to and from the Port of Oakland.

Recommendations

The Coalition for Clean and Safe Ports urges the Port of Oakland to immediately take three steps to address the flaws of the Seaports Emissions Inventory:

1. Immediately issue an Addendum to the Seaports Emission Inventory stating that the Inventory underestimates emissions from port trucks because it does not include their emissions from operations in West Oakland or along the freeways within the SF Bay Area. G-5
2. Update the Seaports Emission Inventory, as soon as possible, to include the California Air Resources Board's emissions data on port truck operations within West Oakland. G-6
3. Conduct a destination survey of the port truck fleet in order to estimate total emissions from port trucks within the SF Bay Air Basin. G-7

Sincerely,

Margaret Gordon, West Oakland Environmental Indicators Project (EIP)
Swati Prakash, Pacific Institute
John Brauer, Oakland Workforce Development Collaborative,
Doug Bloch, Change To Win
Pastor Ricky Jenkins, Interfaith Committee for Worker Justice (ICWJ)
Chuck Mack, Teamsters Local 70
Sharon Cornu, Central Labor Council of Alameda County, AFL-CIO
Diane Bailey, Natural Resources Defense Council
Margaretta Lin, East Bay Community Law Center (EBCLC)
Shirley Burnell, Oakland ACORN
Amaha Kassa, East Bay Alliance for a Sustainable Economy (EBASE)

ATTACHMENT 2

Other Comment Letters

Related to Air Emissions

List of Comments - **Received in September 2007**

9/14/07 Bay Area Ditching Dirty Diesel Collaborative
Letter from the Ditching Dirty Diesel Collaborative Steering Committee
To the California Air Resources Board commenting on the Health Risk Assessment

9/19/07 James Fine, on behalf of the Environmental Indicators Project
e-mail from dfine@usfca.edu <<9/19/2007 10:17 AM>>
Comments on the Seaport Air Emissions Inventory and on the August 14, 2007 meeting discussing the air quality improvement plan

Bay Area Ditching Dirty Diesel Collaborative

September 14, 2007

Dan Donohoue
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Dear Mr. Donohoue:

The Ditching Dirty Diesel Collaborative appreciates the effort the California Air Resources Board has expended on exploring the pollutant emissions and health impacts in West Oakland. However, we would like to share with you two concerns we have about the Draft Emissions Inventory for the West Oakland Health Risk Assessment that was presented at a community meeting on August 21, 2007. The mission of this Collaborative is to build a powerful coalition of environmental justice and health affected groups to implement a campaign to reduce diesel pollution regionally while conducting education and outreach to build awareness and a larger constituency for change. Our first concern is about the methodology used to create the inventory and the implications of that methodology. Our second concern has to do with how the emissions inventory, and ultimately the health risk assessment that will be based on it, will be used by the California Air Resources Board (CARB) to protect the health of West Oakland residents.

The draft emissions inventory, as presented at the community meeting, divides emissions into three segments – Port of Oakland emissions, Union Pacific railyard emissions, and West Oakland emissions. The purpose of this division seems clear – to be able to identify where the emissions of pollution that impact the health of West Oakland residents originate so that emission reduction efforts can be targeted appropriately. Unfortunately, we feel the emission inventory was structured in such a way as to defeat this purpose.

For the Port's total emissions inventory to make sense from a risk-based perspective, it should have encompassed all the emissions associated with Port-related activities that impact the health of West Oakland residents. Instead, the Port's total emissions inventory excluded the emissions caused by port-related truck trips after they left the port and passed through West Oakland, and improperly included them as part of the community emissions. This does not make sense from a risk perspective because these emissions occurred only because of the presence of the Port next to the community. These emissions, and the risks associated with these emissions, should be assigned to the Port. Including these

emissions in the community segment instead of the Port segment also artificially inflates the ratio of community-created pollution to Port-created pollution.

This ratio was further artificially inflated by the inclusion of non-port related Bay Area ocean-going emissions in the West Oakland Community emission inventory. The inclusion of these ocean-going emissions can't be justified scientifically since other adjacent and closer land-based emissions that also could impact West Oakland residents weren't included. The relationship between the emissions totals for the Port and the community is drastically different if these emissions are removed from the West Oakland Community total. Instead of the West Oakland emissions seeming to be roughly 2 ½ times the amount of the Port emissions (627 tons per year vs. 261 tons per year) they would be one-half the amount (116 tons per year vs. 261 tons per year). Keep in mind that the ratio will change even further when port-related truck trip emissions are shifted from the West Oakland community to the Port's total.

This distorted presentation damages this inventory's use as a meaningful tool to help target reduction efforts. It obscures the true total of emissions that occur within West Oakland that this planning process can exert some control over, and misrepresents the significance of Port emissions to the overall total impacting the community. We strongly urge you to adjust the emissions inventory accordingly.

The second issue we are concerned about is the ultimate use of the West Oakland Health Risk Assessment by your agency. In responding to questions from community members at the August 21st meeting about these shortcomings in the emissions inventory you stressed that the California Air Resources Board is regulating the various sources of diesel emissions on a state-wide basis, thus minimizing the potential impact any shortcoming in the emissions inventory might have on your efforts. This response seems to imply that the overall results of the Health Risk Assessment will also have little impact on CARB's state-wide regulatory efforts.

The Ditching Dirty Diesel Collaborative believes the opposite - that the results of Port-related Health Risk Assessment should be used by the Air Resources Board to mold state-wide diesel-related regulations. Ports are hot-spots of diesel emissions, and as such create Environmental Justice problems by causing disproportionate health burdens on their fenceline communities. State-wide efforts to reduce diesel-related emissions must specifically target these localized environmental injustices, and not just satisfy overall state-wide goals for median ambient air quality improvements.

We look forward to continuing to work with your agency and all the other partners engaged in this process to create the best possible Health Risk Assessment that can be used to protect the health of the West Oakland community. If you would like to discuss our concerns expressed in this letter further please contact Frank Gallo at nspk2002@yahoo.com.

Sincerely,

The Ditching Dirty Diesel Collaborative Steering Committee

cc. Henry Hilken, Bay Area Air Quality Management District
Delphine Prevost, Port of Oakland

By James D. Fine
On behalf of the Environmental Indicators Project

Comments on two Port of Oakland products:

1. **MAQIP Task Force meeting on August 14, 2007**
2. **Draft 2005 Seaport Air Emissions Inventory**

Comments are organized by topic, but not ordered by importance. A summary of recommendations is included at the end. These comments are the opinion of James Fine and are submitted on behalf of the West Oakland Environmental Indicators Project.

MAQIP Task Force Planning Process with Co-Chairs

At the Aug 14th meeting Margaret Gordon, Co-Chair, expressed objections that several topics and "co-chair recommendations" were not discussed with her prior to the meeting. This raises serious questions of process that need to be resolved. A report on actions taken in response to Ms. Gordon's comments ought to be the first step of the next Task Force meeting.

Goals

Focusing on health-based goals is an excellent orientation for the MAQIP. Quantitative health goals can be developed from the metrics presented by Dr. Iton by comparing West Oakland health with other areas of Alameda County. We can also compare West Oakland to California and the U.S., and should consider established standards, such as EPA's cumulative risk standard that limits the impacts of new projects in terms of their contribution to increased cancer risk and increased ambient levels of criteria air pollutants. These "cumulative risk" goals would be applicable to new projects by the Port or its tenants, but provide no guidance about community health goals.

Using a percentage reduction goal is acceptable once we have a reliable baseline estimate of emissions. However, as discussed in more detail below, the estimate is very uncertain due to incompleteness and inaccuracy.[1] Given estimate uncertainty, emissions goals need to have "backstop" absolute values to ensure that emissions do not exceed levels sufficiently protective of the health of residents in West Oakland and on Port property.[2]

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[1] The fact that emissions estimates are uncertain is not disputable. What is important to consider is the magnitude of uncertainty and the implications of uncertainties for MAQIP implementation and goals. Most retrospective research finds that emissions estimates are uncertain by a factor of one or more. For examples, see Russell, A. and R. Dennis (2000). "NARSTO critical review of photochemical models and modeling." Atmos. Environ. 34: 2283-2324, Fine, J., L. Vuilleumier, et al. (2003). "Evaluating Uncertainties in Regional Photochemical Air Quality Modeling." Ann. Rvw. Energy and Resources V28, Harley, R., R. Sawyer, et al. (1997). "Updated photochemical modeling for California's South Coast Air Basin: Comparison of chemical mechanisms and motor vehicle emissions inventories." Environ. Sci. & Technol. 31: 135-154, Marr, L., D. Black, et al. (2002a). "Formation of photochemical air pollution in Central California: 1. Development of a revised motor vehicle emission inventory." Jrnl. Geophy. Res. 107(6). and NARSTO (2000b). Chapter 4: The Air-Quality Modeling System. An Assessment of Tropospheric Ozone Pollution: A North American Perspective., North American Research Strategy for Tropospheric Ozone (NARSTO).

[2] To illustrate this concern, let's assume that the draft inventory is used to set a reduction goal at 85% below 2005 levels, and that we accept the linear dose-response relationship. If we set this goal using the estimate provided by the Port, it will equal 85% of 270 tpy, or 230 tpy of reductions, leaving 40 tons per year of emissions. But if Port emissions actually are closer to 460 tpy, emissions after achieving all MAQIP implementation plans would be 230 tpy (= 40 + 190), which is quite likely to be above healthy levels.

When choosing health metrics, it is important to recognize that the adverse effects of the five pollutants considered by MAQIP vary significantly. Carbon monoxide emissions are likely to cause near-field impacts, notably to workers at the Port, whereas NOx emissions contribute to high levels of ozone, acid deposition and fine PM concentrations. Furthermore, while we're discussing health, we ought to consider the health impacts of greenhouse gas (GHG) emissions. Failure to include GHG in the MAQIP is an egregious oversight from an environmental perspective and a missed entrepreneurial opportunity. There are far more investment dollars pursuing GHG emissions reduction than PM reduction[3], but in many cases the control strategies are the same or mutually reinforcing. Including GHG reductions goals will provide a route for considerable additional private and public funds for emissions controls, and will help the Port of Oakland to set the standard for air quality planning (i.e., will be part of an air quality plan that is more comprehensive and forward-thinking than plans developed by other ports.)

Forecasting reductions in future health risks due to emissions reduction is difficult. Environ proposes to use a straight-line (i.e., linear) extrapolation that assumes emissions reductions will result in a proportionate reduction in health impacts. Unfortunately, the science tells us that the relationship is not so simple.[4] As a "first guess" approach, we might be inclined to use this same approach but, at a minimum, would want to know what risks we accept in this simplification. Below is a graphic showing three dose-response curves and a hypothetical 85% reduction in emissions from 2005 levels by year 2020. (Note that the graphic assumes, incorrectly, that emissions are proportionate to dose.) The three dose-response curves are linear, supralinear and sublinear. Assuming the relationship is linear suggests that cancer will decline proportionally with PM emissions reductions.

EPA uses lots of other measures of acceptable health risk, largely following precedents set for benzene exposure where EPA established a risk-based target goals without specifying sources or specific pollutants. EPA notes that a 100 in one million risk is not acceptable, and that as many people as possible should experience risk below one in one million chance of cancer. Residents of West Oakland already are overburdened, so "no net increase" in risk not a sufficient goal. Rather, risk must be reduced. By this logic, any new project would require offsets above and beyond the increase in risk imposed by project-related emissions. The idea of no net increase should apply to future (i.e., 2020) levels as well as today.

There are two major problems with the linearity assumption. First, it ignores the complex relationship between emissions and exposure that includes dispersion, deposition and chemistry. Environ presented a schematic that included only dispersion, omitting chemistry or deposition. Chemistry includes conversion of NO_x to nitrogenous acids and

[3] For example, see CNN News.com story at http://news.com.com/Smart+money+eyes+climate+change/2100-11746_3-6091772.html, last visited on September 6, 2007.

[4] For example, see *The Question of Nonlinearity in the Dose-response Relation Between Particulate Matter Air Pollution and Mortality.* Am J Epidemiol. 2006 Dec 15;164(12):1242-50. Epub 2006 Sep 27.

fine PM, and SOx to sulfurous and sulfuric acids. As well, ROG photo-disassociation creates hazardous byproducts capable of triggering asthma and causing cancer and birth defects.

There is yet a more fundamental concern. If the dose-response relationship is actually sub-linear, then the linear assumption is likely to be a good approximation as we approach the standard EPA goal of 1 cancer per 1,000,000. However, PM mortality D-R relationships are known to be nonlinear, typically depicted as a logistic function. At low levels of exposure, the logistic function mimics a supra-linear relationship, so the PM mortality risk may remain well above planning goals based on the linearity assumption. This concern relationship is depicted in the graphic below. To exemplify this concern with real numbers, I use Pacific Institute estimates that 100 cancers per year due to diesel PM in West Oakland, as shown in the table, and that the planning goal is two cancers per year. If the dose-response relationship is supra-linear (or logistic), then the actual cancer rate (and similarly, PM mortality rate) may turn out to be much larger (in this example, 45 times greater) than planned.

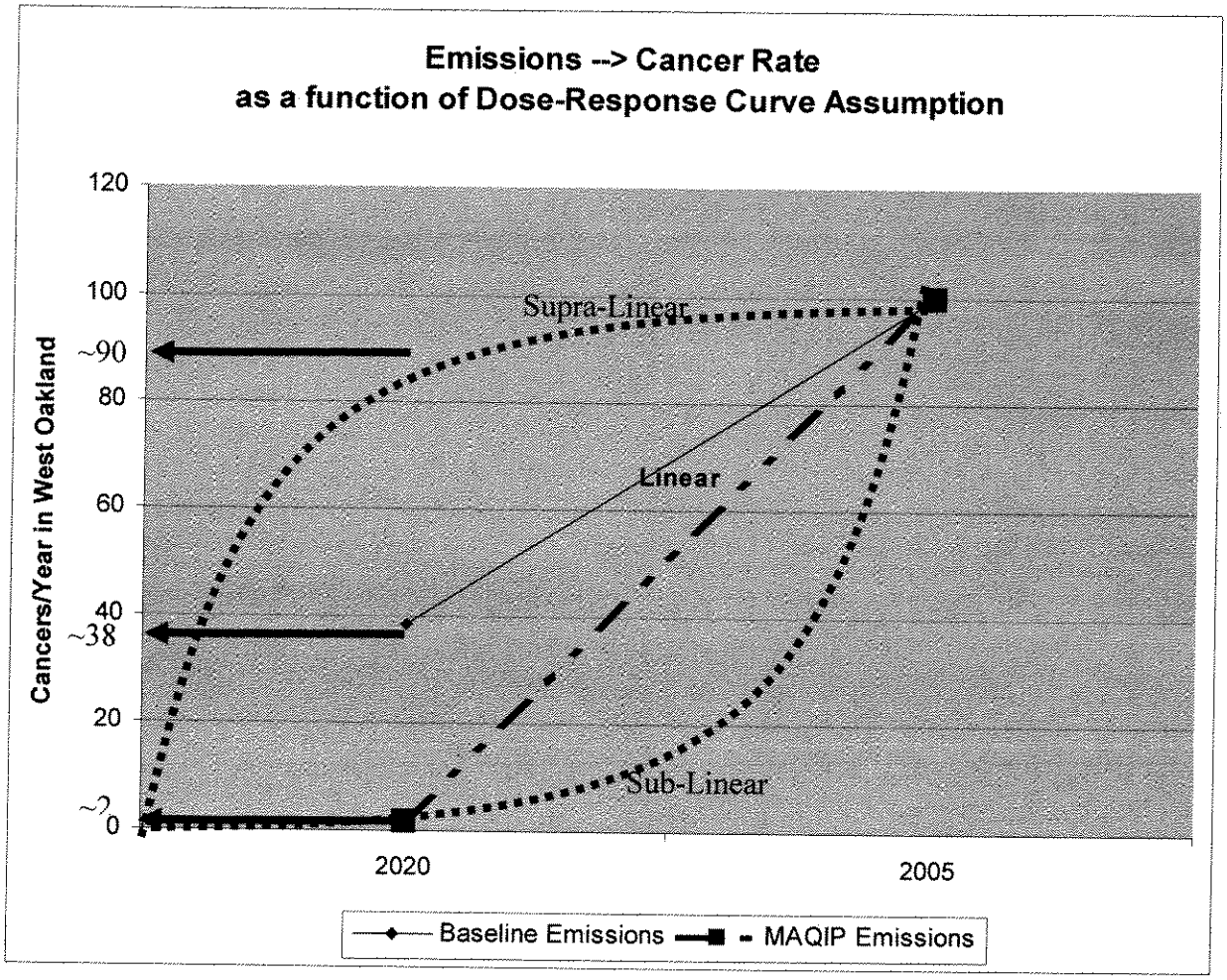
Health Risk Reduction Goals in West Oakland

People & Workers in West Oakland	29,500
Baseline Cancers in West Oakland due to Diesel PM[5]	~100
Non-MAQIP Planned Regulations	~42
MAQIP Cancer Reduction Goal[6]	~2

Clearly health benefits from reducing diesel PM, including well-below the NAAQS standard, are needed for West Oakland. EPA acknowledges this goals by noting that diesel PM levels should be as low as possible because the health benefits of reductions are huge and not just related to cancer risk. Furthermore, Port-related emissions anticipated from new growth should not threatens regional attainment of National Ambient Air Quality Standards. Observations at the Filbert Street station operated by the BAAQMD indicate that the SF Bay Area is not be in compliance with federal $PM_{2.5}$ standard, and this is yet another reason why Port-related emissions must decline relative to current levels.

[5] See Pac Inst (2003) Summary of Studies (pg 37, Table 17), which is based on Cal-EPA's estimate that the Average Cancer Risk in California from diesel PM is 540 cancers per 1,000,000 people due to average exposure of 1.8 $\mu gPM/m^3$. Pac Inst (2003) Clearing the Air (pg 1) finds that West Oakland residents are exposed to six (6) times more diesel PM than the California average. (Need to modify this to distinguish between workers and residents.)

[6] A defensible goal is a diesel PM cancer risk equal to the California average; using the Alameda County average would incorporate county-wide risk due to Port-related and other diesel emissions that is above the Bay Area and statewide averages.



Performance Standards

Performance standards are not the same as performance-based goals, but it appears that the two are not distinguished in the MAQIP. For example, a performance standard will set emissions standards for a specific source (e.g., allowable truck PM emissions by truck vintage) but may say nothing of total emissions form that source (e.g., total emissions from all trucks operating at the Port). My concerns about performance-based goals pertain to the following:

- It may facilitate "trades in place" that allow for continued emissions by sources causing significant PM exposure to sensitive receptors. Due to ethical reasons, some emissions must cease regardless of cost.
- Task Force members may not appreciate the market-based mechanism of emissions trading and its potential to be an effective policy solution. The benefits and challenges of a performance-based approach need to explained and associated uncertainties pertaining to program design and implementation similarly warrant a

public discussion rather than (or in addition to) a presentation. This would be a good topic of discussion for another Port-led educational event (i.e., Port 102 that builds on the Port 101 event.)

There are many types of standards, including technology, ambient and performance. Performance standards are not necessarily a cure-all. In practice, a combination of standards regulatory mechanisms – such as fees or taxes – may be needed to achieve goals. It is too early in the MAQIP process to categorically reject the host of policy mechanisms available for meeting goals.

Guiding Principles

Comments following the June 11th meeting noted that there is lack of clarity about how, if at all, the Guiding Principles will be used for decision-making. No information provided on Aug 14th addresses this question and provides clarity about why these principals were deemed so important and allocated so much attention at Task Force meetings.

Regarding the specific language of the Principles, the term "as expediously as feasible" is planner-speak for affordability and political acceptability. It does not address the question of who pays and who decides what is affordable or politically acceptable. If those are indeed limiting constraints to achieving goals, then the disclaimers should be stated clearly not with vague language. Quantitative measures need to be established.

Dr. Tony Iton and the Task Force commented that the Port needs to be an aggressive leader, and not a passive "fair share" contributor, to restore resilience amongst West Oakland residents. To do so means a guiding principal to Create not merely Promote Environmental Justice in West Oakland because the baseline condition is one of injustice.

Cost-based Decision Criteria

There were several TF comments pertaining to cost-effectiveness and balancing costs with benefits. Missing from this dialogue a clear understanding of the decision-metrics. For a good list, we suggest Morgan and Henrion (1990) and have attached page 26 as an appendix to these comments[7]. This would be another good topic for a Port 102 learning session.

[7] Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis. Cambridge Univ. Press, page 26 and associated discussion.

Baseline Emissions Estimates

Comments on the June 11, 2007 MAQIP TF meeting, requested three sets of information need to be provided to TF members to understand Port-related emissions:

- Emissions profile
- Complete and detailed report of estimation methods
- Information about the reliability of emissions estimates

Environ provided a methods report and the Port released its draft estimate of emissions for 2005.[8] These are major steps forward, though only the Port's document is likely to be reviewed by the Task Force.

Information about the reliability of emissions estimates has not been provided and the emissions profile presented in the Port's draft estimate omits several port-related sources within the West Oakland community, did not include construction emissions that will occur with infrastructure projects, and did not include quantitative values for (e.g., total tons/year) ROG, CO, NO_x and SO_2.

The estimate presented for Port emissions is underreported by at least 50% because it does not included Port-related emissions in West Oakland and railyards, and does not include construction emissions due to Port expansion projects.[9] These emissions occur because of Port seaport activities and should be in the MAQIP emissions baseline.

A more inclusive emissions estimate is at the fingertips of Port and Environ, and has been presented to the West Oakland community by ARB staff. These emissions estimates are being developed by for the West Oakland health risk assessment modeling study and provide a means to estimate port-related emissions in West Oakland.

My estimate of baseline and forecasted emissions is presented below. The forecast is based on information presented by Environ at the Aug 14, 2007 MAQIP meeting. My baseline "best guess" of 460 tons per year of Port-related emissions is nearly double the draft estimate published by the Port. However, the "best guess" estimate does not include known uncertainties and should thus be considered larger for precaution. Using uncertainty factors that are themselves uncertain, I estimate a most conservative baseline PM emissions estimate of nearly 1,000 tons per year, as shown below. However, I am NOT suggesting that 1,000 tpy be used for a planning inventory. Rather, this upper confidence interval can be translated into an acute exposure estimate for a particularly bad emission day. It is also illustrative of that fact that we should NOT be overly concerned with resolving an "accurate" emissions estimate because it will inevitably be inaccurate.

[8] Comments submitted herein are premised on having not yet had time to review the full report. I anticipated additional comments following report review.
[9] See CARB's West Oakland Health Risk Assessment emissions estimate for Parts II and III. Contact Carolyn Suer at CARB.

Source	2005 Tons Per Year	CARB HRA Part	Uncertainty Factor[10]	Conservative Acute Exposure (Tons Per Day for a Peak Day)
On Port NonTruck Emissions	245	I	0.5	367.5/365 = 1.0
On Port Truck Emissions	16	I	1.5	40/365 = 0.11
HDD Trucks (Port-related)	91	III	2	273/365 = 0.75
Construction	40[11]	Not Included in I	2	120/365 = 0.33
UP Rail Yard	11	II	0.25	13.75/365 = 0.038
UP & BNSF Rail (Port-related)	1	III	0.25	1.25/365 = 0.003
Undocumented Nonpoint Emissions	50[12]	Not Included in III	2	150/365 = 0.41
Distribution & Truck Centers	2	III	0.5	3/365 = 0.001
Total DPM Port-Related	**460**			970/365 = **2.66 tpd**

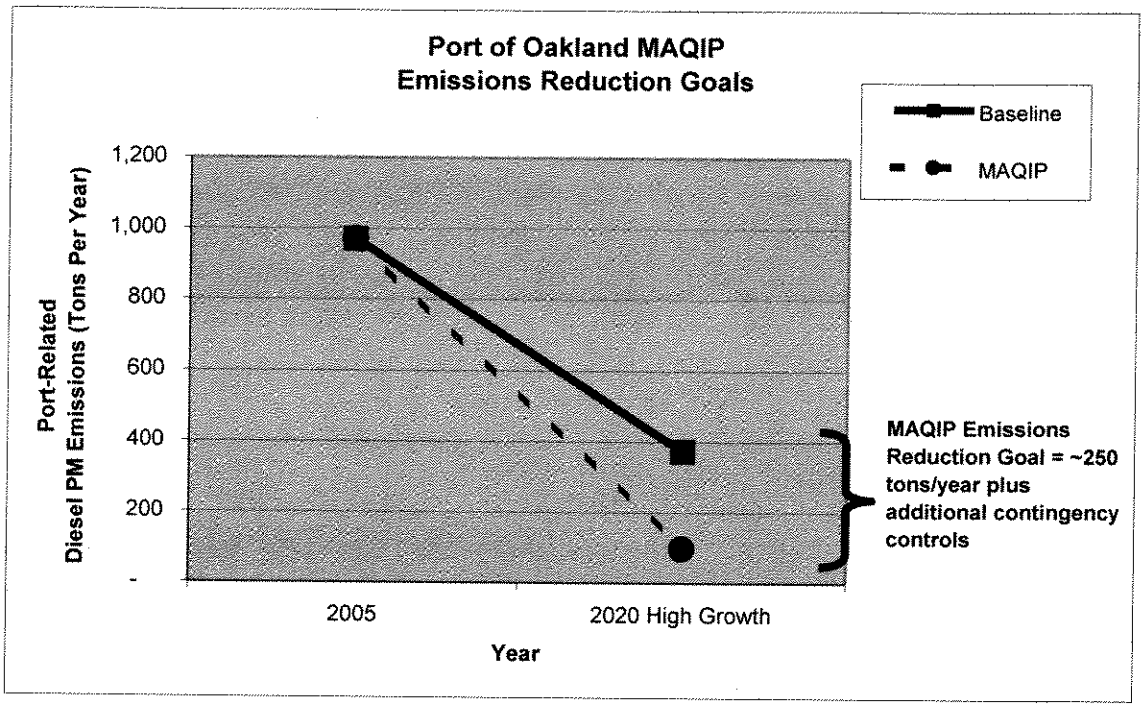
My estimate includes heavy duty diesel truck emissions that comprise closer to twenty five (25) percent of the total (shown below in both the West Oakland community as HDD trucks and On-Port emissions. My estimate suggests that the contribution from trucks is about five times greater than indicated in the Port's draft estimate. Also it is of paramount importance to represent truck emissions as accurately as possible because their activity within the community creates significant exposures and because very cost-effective emissions reductions are likely to be identified by scrutinizing and optimizing truck activity. Notably, careful logistical planning and truck route enforcement might significantly reduce idling emissions at the Port and in the West Oakland community.

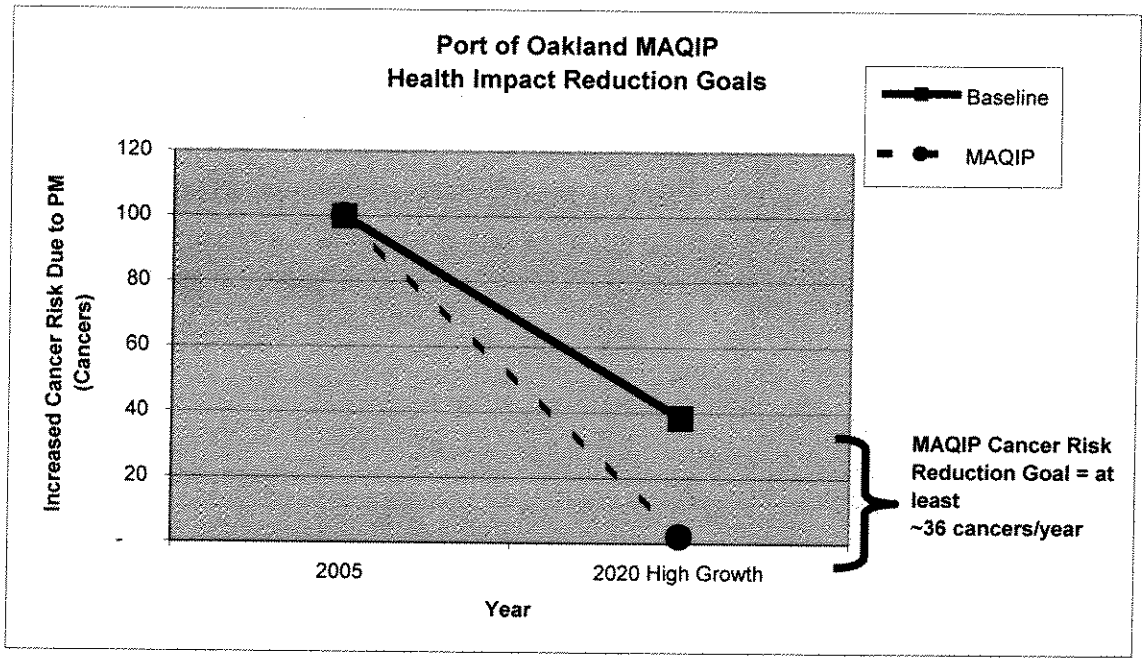
The figures below show hypothetically how we can identify quantitative emissions reductions and health goals for the MAQIP. The specific numbers are not so important as the graphical presentation and conceptual approach toward quantification.

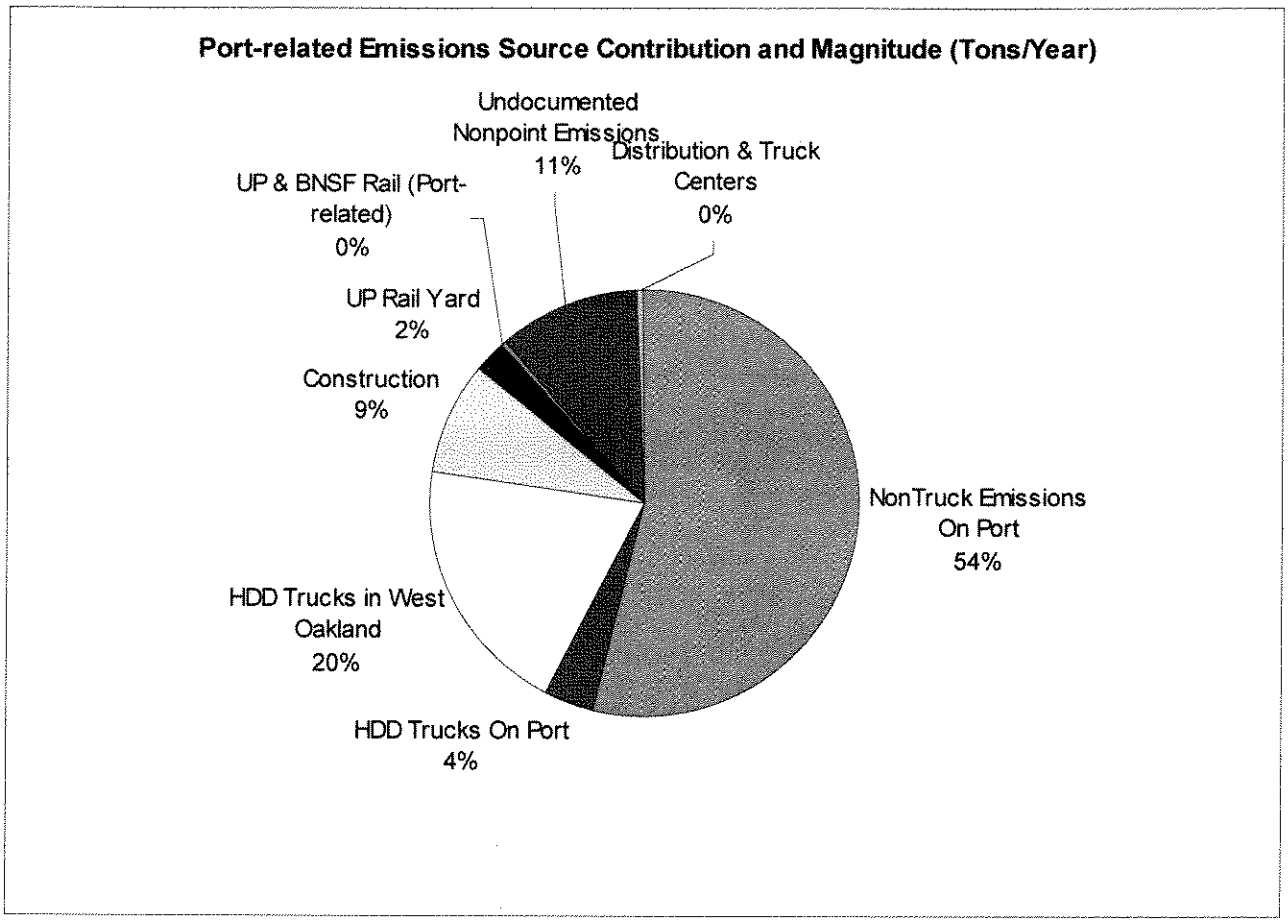
[10] The rationale for uncertainty factors in provided in the next section, but they warrant more detailed peer review.

[11] Assumed to be equal to 10% of other Port emissions. The BAAQMD CARE estimate of construction emissions is of little help in terms of magnitude, but provides guidance in terms of proportion. Regionally, construction PM emissions are approximately one-third of total emissions. Construction emissions are probably more than 1/3 of the risk in West Oakland because exposures occur in and near residential communities.

[12] Assumed to be 50% of HDD truck emissions in West Oakland area, but likely to be much larger. See footnote 14.


Port of Oakland MAQIP
Emissions Reduction Goals
Baseline
MAQIP
Port-Related
Diesel PM Emissions (Tons Per Year)
1,200
1,000
800
600
400
200
-
2005
2020 High Growth
Year
MAQIP Emissions Reduction Goal = ~250 tons/year plus additional contingency controls


Port of Oakland MAQIP
Health Impact Reduction Goals
Baseline
MAQIP
Increased Cancer Risk Due to PM
(Cancers)
120
100
80
60
40
20
-
2005
2020 High Growth
Year
MAQIP Cancer Risk Reduction Goal = at least ~36 cancers/year



Emissions Estimate Uncertainties

We will never know how uncertain our current baseline emissions "best guess" is until we have the benefit of hindsight. We can plan now, however, for that uncertainty based on lessons from several decades of estimation methods and retrospective adjustments, as summarize here briefly:

- Emissions from major "smokestack" industrial sources are reasonably well known, with continuous monitors providing real time emissions measurements for major facilities. Few of the Port of Oakland seaport sources are point sources.
- We have very limited knowledge of emissions from dispersed, small sources, including residential, commercial, mobile, biogenic and geogenic sources.
- Industrial emissions from sources other than smokestacks (e.g., leaky pipes and valves) are not known accurately.
- Traditionally, motor vehicle and biogenic VOC emissions have been under and over estimated, respectively.
- Russell (1997, see footnote 1) has the benefit of hindsight when he summarized how actual values, once observed, differ from the estimated emissions has found that mobile source ROG emissions are underestimated by a factor of at least two

and that other volatile organic compound emissions sources, if studied in more detail, would be found to be very uncertain too.
- Mobile NO_x emissions tend to be better understood than mobile VOC emissions, but this is not the case for sources that have received limited attention, such as large and small ocean-going vessels and container-moving equipment.

Regarding PM emissions, I recognize that mobile source emissions estimates are of considerable importance, but are poorly understood in terms of emissions factors and activity.[13]

Some potentially significant emissions sources are known to be missing from the estimate used by the Port and the more inclusive ARB estimate. In particular, no discussion of the following sources – in terms of rationale for omission or plans for inclusion – has been presented to the Task Force:

- Many small sources in the community are not yet documented[14]. Though these emissions are not part of the MAQIP planning estimate, they do contribute to community health risk.
- Ships are modeled to beyond the Golden Gate Bridge. Doing so suggests a region of significance that is inclusive of neighboring anthropogenic sources such as EBMUD, Emeryville and Downtown and East Oakland.[15]
- Construction emissions from Port expansion. While it is possible to calculate construction-related emissions for the 2005 baseline, more important is including these emissions in forecasts for 2020 and intermediate years.

In addition to these additional sources of exposure, we must also acknowledge the known vulnerability factors in West Oakland.

Given these well-documented uncertainties in emissions estimation, I suggest a precautionary planning baseline for an acute exposure day (i.e., a day when cargo activity

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[13] For example, see the U.S. Dept of Transportation symposium at:
http://www.fhwa.dot.gov/environment/pm/stratwkp/pmstr7.htm
as well as the CARB discussion of fine PM research needs at:
http://www.epa.gov/ttn/chief/conference/ei10/pm/gaffney.pdf
Also, see NARSTO (2003). Particulate Matter Science for Policy Makers: A NARSTO Assessment, Part 2, NARSTO.

[14] For peer-reviewed research on these sources and the implication for community health risk, see Raul P. Lejano1 and C. Scott Smith, (2006) *Incompatible Land Uses and the Topology of Cumulative Risk.* Environmental Management. Volume 37, Number 2. February.

> "Developing a rapid risk mapping protocol, we scan the neighborhood [Southeast LA, known as Asthmatown] for small potential sources of air toxics and find, literally, hundreds of small point sources within a 2-mile radius, interspersed with residences. We also map the estimated cancer risks and noncancer hazard indices across the landscape. We find that, indeed, such large aggregations of even small, nondominant sources of air toxics can produce markedly elevated levels of risk. In this study, the risk profiles show additional cancer risks of up to 800 in a million and noncancer hazard indices of up to 200 in SELA due to the agglomeration of small point sources."

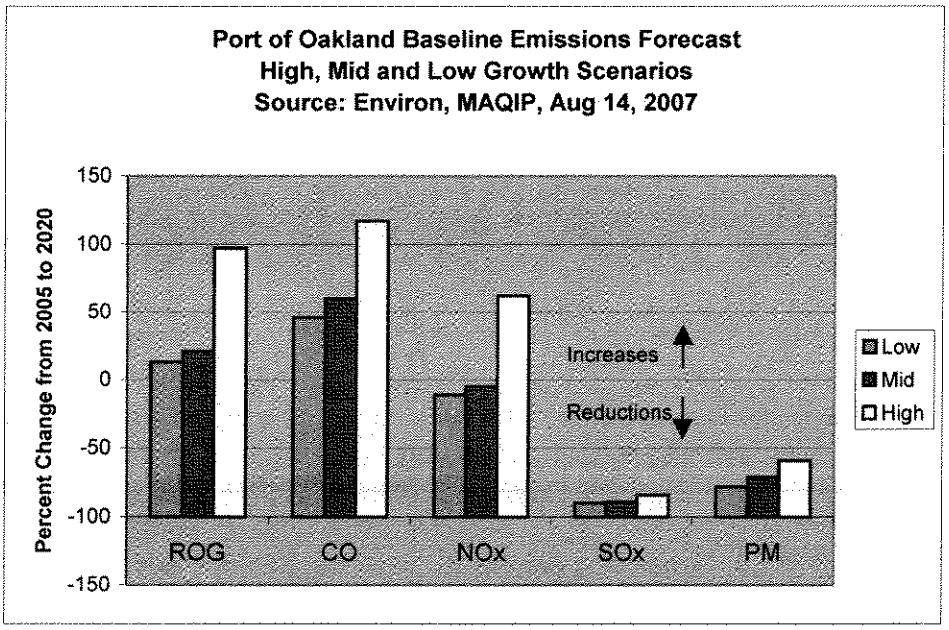
[15] This question was raised by Michael Kent at the Aug 21, 2007 community meeting to discuss ARB emissions estimate.

is at a peak and when truck traffic is heaviest) of ~2.7 tons per day for use in developing quantitative reductions goals pertaining to acute exposures. Doing so will result in a plan that has a greater likelihood of being sufficiently protective of human health.

I also highlight that the uncertainties are quite significant and thus it is NOT constructive to spend a lot of time arguing about one or a few tons of annual emissions. More important, I think, is to develop a plan that is able to adapt to new information and that creates a policy framework that is not reliant on a precise estimate of emissions. The emissions estimate is most useful for determining the major source categories and for considering how those major sources impact health in West Oakland. This latter step uses the emissions estimate in a health risk assessment modeling study and thus the ARB HRA results ought to be utilized in the MAQIP, which I discuss in greater detail below.

Emissions Forecasts

Emissions forecasts ought to be presented graphically so the audience can see trends. Percentage change from the baseline is shown graphically below, thereby highlighting anticipated significant growth in ROG, CO and NO_x emissions regardless of the growth scenario.



Specific goals related to ROG need to be discussed earlier than later. All growth scenarios show how ROG and CO emissions are projected to grow. ROG breaks down in the atmosphere into byproducts that might include toxic pollutants. Many of the pollutants listed by EPA and CARB as air toxic pollutants are within the class of gases called ROG, including benzene, ethylene dibromide, ethylene dichloride, hexavalent chromium, dioxin, perchloroethylene, trichloroethylene, chloroform, formaldehyde, 1,3-butadiene, acetaldehyde, acrylonitrile, beryllium, dimethyl sulfate, ethyl acrylate,

hexachlorobenzene, lead, mercury, polycyclic aromatic hydrocarbons (PAHs), PCBs, polychlorinated biphenyls (PCBs), propylene oxide, styrene, and toluene diisocyanates.[16]

Using CARB's HRA for MAQIP Goals

CARB is developing an estimate of emissions and modeling to simulate computationally how diesel PM emissions in and near the Port of Oakland are blown toward people who live and work in West Oakland. CARB is using the CALPUFF17 model. The baseline modeling study does not include atmospheric chemistry or non-diesel PM emissions sources, and is based on year 2005 emissions

The MAQIP is a plan to improve air quality in West Oakland, whereas the HRA is computational tool that estimates average annual ambient PM concentrations by merging a "best available" estimate of emissions that is spatially and temporally described, observations of wind patterns, and descriptions of the terrain.

In addition to CARB's 2005 Baseline study, the HRA can be used to develop MAQIP emissions reductions goals and metrics to evaluate progress toward goals. Embedded in the exploration of this simple task are several different emissions estimates that are summarized and named in the following matrix:

Emissions Scenarios	**Business as Usual** (no emissions controls)	**Planned Regulations** (Non-MAQIP reductions already planned or required	**All Reductions** (Non-MAQIP reductions plus MAQIP reductions)
Current Year (2005)	Current Baseline	N/A	N/A
Future Year (2020)	Future Baseline	Regulation Case	Regulation Case + MAQIP

For future years, the Baseline case represents business as usual in the sense that no additional emissions controls are implemented while goods movement growth leads to additional emissions. The Regulation Case acknowledges that existing control efforts, regulations and anticipated laws (such as CARB's proposed port truck and marine vessels cleanup rules) will yield reductions relative to the Baseline even if the MAQIP were never implemented. The third scenario is future emissions with both regulations already planned and MAQIP reductions.

Associated with each emissions scenario are air quality and health effects scenarios. Currently, the ARB has made a commitment to analyze the Current Year Baseline scenario and expects findings in October 2007. To inform the MAQIP decision-process, all three future scenarios need to be developed (in terms of emissions estimates) and analyzed using the HRA modeling platform to determine if the Regulation Case + MAQIP scenario will provide acceptable air quality and public health in West Oakland.

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[16] Refer to Seinfeld and Pandis (1998). Atmospheric Chemistry and Physics. John Wiley & Sons, Inc. Pages 107-111.

17 For descriptions of CALPUSS, see http://www.src.com/calpuff/calpuff1.htm (last visited July 26, 2007) or http://www.epa.gov/scram001/dispersion_prefrec.htm#calpuff (last visited July 26, 2007).

In addition to estimating health risk, the model can provide outputs relevant to the MAQIP, including:

- Sensitivity coefficients - quantify the relative contribution of each source category to ambient PM concentrations in West Oakland residential areas.
- Emissions reductions goals – quantify the amount of reductions needed to achieve future year air quality and health risk goals.
- Progress Evaluation metrics – quantify midpoint (between current year and year 2020) emissions and air quality goals for use in assessing progress toward year 2020 goals.

Task Force participants need an opportunity to understand how these three types of modeling output are useful and will be used for the MAQIP.

Conclusions and Specific Recommendations

The following list of recommendations summarizes the major points of these comments.

1. Use the HRA platform developed by CARB to inform MAQIP goals and progress evaluation. Doing so will require a clear commitments from BAAQMD, Port staff and their consultant to work together to develop emissions forecasts. These emissions estimates will need to include forecasts for Parts II and III, as well as Part I, of the current ARB HRA emissions estimate.

2. If cost-benefit is analysis to be conducted to compare mitigation alternatives, research is needed to quantify the dollar value of health and other adverse environmental impacts of diesel gasoline and other fossil fuel use. That is, more expensive mitigation options may be "worth the extra cost" if they address emissions causing significant exposures.

3. The MAQIP planning team – Port and Environ staff – must develop an approach to treating uncertainty in both the estimate of baseline and forecasted emissions, and uncertainty in the implementation rates and effectiveness of control measures. Assume these comments are a "first cut" estimate of emissions that incorporates uncertainty. I recommend that the Port request a critical review of the Environ emissions estimate by faculty in the Department of Civil Engineering at UC Berkeley and the Atmospheric Science Program at Lawrence Berkeley Labs.[18] As part of the critical review, uncertainty factors for source categories can be refined. Once uncertainty is well-described, several steps are needed to incorporate the information into MAQIP plans, including:
    - Development of an emissions baseline and forecast ranges (i.e., best guess and most conservative)
    - Development of MAQIP goals with backstops

[18] Contact Drs. William Nazaroff and Robert Harley at UC Berkeley, and contact Dr. Nancy Brown at Lawrence Berkeley Labs.

- Description of each source in terms of:
  - Proximity to community
  - Reliability of estimate
  - Implications of health risk if source category estimate is low
  - Association of major uncertainties with exposure risk
  - Characterization of experiences with proposed control measures
  - Expectations for cost effectiveness and implications of uncertainties in terms of cost
  - Assessment of regulatory mechanisms and jurisdictions for each control measure and the roles of various agencies in assessing and managing uncertainty as the MAQIP is implemented
  - Contingency planning measures to be implemented if, due to emissions estimate uncertainty or other factors, progress towards goals is not being achieved.

4. Add the following agenda items to the next Task Force meeting
   - Explanation of performance standards and the potential role of other regulatory mechanisms, such as taxes or fees.
   - Explanation of decision metrics as listed by Morgan and Henrion (see appendix) and how they relate to the metrics used in the MAQIP
   - Using the ARB HRA to developed quantifiable ambient PM forecasts and goals
   - ROG emissions reductions need to be specifically considered.
   - Provide graphics contained in these comments to the MAQIP TF for review and feedback

5. Carbon is the fundamental building block of life and is also a foundational environmental management issue. It is perhaps THE issue of our generation, and thus must be embraced for its importance and, more pragmatically, for it's potential to make available additional significant sources of funding, both public and private, to achieve emissions reductions. Include greenhouse gas emissions in the MAQIP.

By James D. Fine
On behalf of the Environmental Indicators Project

Appendix: Decision Metrics from Morgan and Henrion (1990).

Uncertainty

A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis

M. GRANGER MORGAN AND MAX HENRION

with

a chapter by Mitchell Small

CAMBRIDGE
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Table 3.2. *Examples of some of the alternative decision criteria that may be applied in policy analysis for risk management*

Utility-based criteria

- *Deterministic benefit–cost*: Estimate the benefits and costs of the alternatives in economic terms and choose the one with the highest net benefit.
- *Probabilistic benefit–cost*: Same as deterministic benefit–cost but incorporate uncertainties and use expected value of resulting uncertain net benefit.
- *Cost effectiveness*: Select a desired performance level, perhaps on noneconomic grounds. Then choose the option that achieves the desired level at the lowest cost.
- *Bounded cost*: Do the best you can within the constraints of a budget that is the maximum budget society is prepared to devote to the activity.
- *Maximize multi-attribute utility*: This is the most general form of utility based criterion. Rather than use monetary value as the evaluation measure, MAU involves specifying a utility function that evaluates outcomes in terms of all their important attributes (including uncertainties and risks). The alternative with maximum utility is selected.
- *Minimize chance of worst possible outcome . . . maximize chance of best possible outcome, etc.*: Political and behavioral considerations frequently dictate the use of such criteria.

Rights-base criteria

- *Zero risk*: Independent of the benefits and costs, and of how big the risks are, eliminate the risks, or do not allow their introduction.
- *Bounded or constrained risk*: Independent of the costs and benefits, constrain the level of risk so that it does not exceed a specific level or, more generally, so that it meets a set of specified criteria.
- *Approval/compensation*: Allow risks to be imposed only on people who have voluntarily given consent, perhaps after compensation.
- *Approved process*: Not strictly a decision criterion for analysis, but widely applied in risk management decision making. See discussion in text.

Technology-based criteria

- *Best available technology*: Do the best job of reducing the risk that is possible with "current" or "best available" technology. Because, to a significant extent, the meaning of words like "current" or "best available" is economically determined, in practice technology-based criteria are often modified forms of utility-based criteria.

Hybrid criteria

Hybrids of utility- and rights-based criteria are sometimes used. For example, an upper bound on risk may be established (rights-based) below which a benefit–cost (utility-based) criterion is applied.