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April 4, 2008

Dr. Jean Ospital
Health Effects Officer
South Coast Air Quality Management District
21865 Copley Dr.
Diamond Bar, CA 91765

Re: Comments on the draft Multiple Air Toxics Exposure Study (MATES III) report

Dear Dr. Ospital:

BNSF Railway is providing comments prepared by ENVIRON International Corporation (ENVIRON) on the draft MATES III report. We appreciate your responsiveness as well as that of South Coast Air Quality Management District (SCAQMD) staff in responding to information requests from ENVIRON, and in meeting with ENVIRON staff to discuss both the MATES III chemical mass balance (CMB) and regional modeling analyses. However, it is critical that we note that some requested information was not provided until March 28, leaving insufficient time for an adequate review. Furthermore additional requested critical data has yet to be received and SCAQMD has denied the request for an extension of the comment period.

BNSF believes that the data acquired for MATES III represent an important contribution to our understanding of air toxics in the South Coast Air Basin. However, ENVIRON's review of MATES III, identified a number of important technical questions whose resolution has the potential to substantively alter the analyses and conclusions presented in the draft report. These questions have been developed into a set of technical comments that address the (1) health risk approach, (2) chemical mass balance (CBM) methodology used to estimate diesel exhaust particulate matter [DPM], (3) air toxics monitoring, (4) regional modeling, and (5) emissions inventory. The San Pedro Bay Ports of Los Angeles and Long Beach (Ports) have submitted detailed comments on items 1, 2, 4 and 5.

Because BNSF does not believe there is a benefit in providing duplicate comments on MATES III to SCAQMD, we are limiting our present submittal to those additional comments that are unique to BNSF (with the understanding that SCAQMD will be addressing the comments submitted by the Ports). These additional comments, provided as Attachment 1 to this letter, address those elements of the MATES III air toxics monitoring program related to DPM, particulate matter less than 2.5 microns ($PM_{2.5}$), and the associated elemental carbon ($EC_{2.5}$), particularly as it relates to rail operations. ENVIRON's initial review identified potential inconsistencies between:

- Air monitoring data sets from stations operated by the California Air Resources Board (CARB) and by the Ports with those obtained for MATES III, and
- Monitored $PM_{2.5}$ and CMB results.

Further, ENVIRON believes that MATES III did not adequately discuss and evaluate inconsistencies between modeled risk at the monitoring station locations and risk results based on monitoring data at each of those stations.

BNSF recognizes that these comments, as well as those submitted by the Ports, are limited by ENVIRON's not having yet received all of the supporting technical material requested from SCAQMD. It is BNSF's understanding that despite the close of the formal comment period, SCAQMD will continue to work with ENVIRON to resolve outstanding data requests and the attendant technical issues. BNSF strongly supports this process of ongoing scientific dialogue, and requests that insights gained from that process, as well as from these initial comments, be incorporated into the final MATES III report. Because of the importance of the unresolved issues raised by both ENVIRON and the MATES III Technical Advisory Group, BNSF believes that it would not be appropriate for the SCAQMD to rely on the current draft of MATES III pending resolution of these questions.

In closing, we want to reiterate our appreciation for the opportunity to provide these comments. BNSF and ENVIRON look forward to receiving the data previously requested by ENVIRON that SCAQMD has not yet provided for review and analysis. After receipt of these data, we also look forward to continued productive interactions with SCAQMD prior to finalization of the MATES III report.

Respectfully,

David Seep R.S.

David Seep

cc: Dr. Rob Scofield, ENVIRON
Mr. Mark Stehly, BNSF
Dr. Barry Wallerstein, SCAQMD

ATTACHMENT I

Attachment 1: Overview of Toxics Monitoring

MATES III monitored for 33 toxic air compounds at ten fixed monitoring stations as well as five short-term micro-scale locations. The fixed monitoring station locations are shown below in Table 1-1 and in Figure 1-1. Huntington Park and Pico Rivera only operated for Year 1 of the study (April 2004 – March 2005).

Table 1-1: Location of Fixed Monitoring Stations in MATES III Study

Site	Acronym	Address
Wilmington	WI	1903 Santa Fe Avenue (Note: in Long Beach)
North Long Beach	LB	3648 North Long Beach Boulevard
Compton	CP	720 North Bullis Road
Huntington Park	HP	6301 South Santa Fe Avenue
Los Angeles	LA	1630 North Main Street
Pico Rivera	PR	3713B San Gabriel River Parkway
Burbank	BU	228 West Palm Avenue
Anaheim	AN	1010 South Harbor Boulevard
Fontana	FO	14360 Arrow Highway
Rubidoux	RU	5888 Mission Boulevard

NOTE: The stations are roughly grouped by distance from the Wilmington/Port area

The fixed monitoring stations recorded data every three days over a two year period, sampling for 24-hour average concentrations of toxic air contaminants. The list of contaminants monitored is shown in Table 1-2 below.

Table 1-2: Substances Monitored in MATES III

Benzene	1,3-Butadiene	Carbon Tetrachloride
Chloroform	Chloromethane	Dichlorobenzene
Methylene Chloride	Perchloroethylene (Tetrachloroethylene)	Dichloroethane
Ethylbenzene	Toluene	Trichloroethylene
Xylene	Styrene	Vinyl Chloride
Acetaldehyde	Formaldehyde	Acetone
Arsenic	Beryllium	Cadmium
Hexavalent Chromium	Copper	Lead
Manganese	Nickel	Zinc
Elemental Carbon	Organic Carbon	Naphthalene
PAHs	PM_{10}	$PM_{2.5}$

In addition, MATES III monitored at five temporary micro-scale locations, which operated for about three-months each (Sun Valley operated for almost a year), as data validation for a nearby fixed station location. In addition to 24-hour sampling every three days, the micro-scale locations also had 8-hour sampling for VOCs on select days. The micro-scale locations were located at:

- Commerce
- Indio
- Santa Ana
- Sun Valley
- San Bernardino

The report did not disclose the addresses or specific locations at which these micro-scale stations were installed.

Comments on the MATES III monitoring

The focus of this preliminary review of the MATES III monitoring data will be on elements of the monitoring program related to diesel particulate matter (DPM), measurements of particulate matter less than 2.5 microns ($PM_{2.5}$) and associated elemental carbon ($EC_{2.5}$), due to the MATES III study's conclusion that 83.6% of the basin-wide risk was due to DPM. ENVIRON's initial review indicates three areas of concern regarding the evaluation of air monitoring data in the MATES III study:

- There are potentially relevant air monitoring data from stations operated by either the California Air Resources Board (CARB) or by the Ports of Los Angeles (POLA) and Long Beach (POLB) that could be used to further evaluate the MATES III DPM surrogate determination and modeling analysis. The preliminary analysis of this data indicates that potential inconsistencies between the data sets exist. In addition, the data indicate a higher degree of uncertainty in the assessment of source attribution (especially between sub-regional and local DPM sources) to specific monitors that requires further consideration or study before final conclusions can be drawn. These issues include a specific issue raised by the Technical Advisory Group (TAG) related to EC contributions from spark-ignited engines.
- Lack of agreement between monitored $PM_{2.5}$ results and results from the Chemical Mass Balance (CMB) approach used in the study.
- Insufficient evaluation of modeled risk at the monitoring station locations with risk results from monitoring data.

These three areas are discussed in additional detail in the sections below.

It should be noted that while District staff has been very responsive to ENVIRON's request for MATES III supporting data, ENVIRON still does not have all information we have requested from the District or have only recently received information that requires additional time to

review due to the amount of raw data provided (e.g., modeling information that required data to be transferred via a hard-drive). Therefore, ENVIRON would require additional time to use this information, once it has been provided by the District, in the analyses described in this attachment. However, the preliminary analysis conducted to date has indicated that the three areas of concern identified above may be significant enough to require further study or an expanded discussion of uncertainty in a revised report to fully address the potential concerns discussed in more detail below. At the very least, the uncertainty in measured concentrations and the inability to draw more definitive conclusions on source contributions at individual monitors should be discussed in the final MATES III report given that source attribution information is an important piece of data used for risk management decisions.

1. **Other Potentially Relevant Air Monitoring Data**
   The MATES III study did not include a comparison to other potentially relevant air monitoring data sets available for $PM_{2.5}$ and EC in the Basin. The MATES III study looked solely at MATES III fixed stations in order to determine risk throughout the Basin and disregarded other available data sets. As only a limited amount of data from fixed MATES III stations were used to characterize a large air basin of 16 million people, other data, if available and applicable, would be the basis of a useful, additional comparison or for a more complete discussion of uncertainties in MATES III.

   Figure 1-1 shows the locations of all known air monitoring stations, including the MATES III fixed stations and the additional SCAB monitors described below:

   - **CARB Air Monitoring Stations -** There are 18 additional regularly-operating CARB Air Monitoring Stations that monitor for a variety of pollutants (e,g. criteria pollutants or air toxics) in the SCAB (9 monitor for $PM_{2.5}$). The data from these stations are available from CARB and can easily be used for comparison to MATES III $PM_{2.5}$ and PM_{10} estimates. ENVIRON has received daily EC, $PM_{2.5}$, and PM_{10} data for CARB stations in the SCAB for 2005 and 2006, and included summary statistics on the data, relevant to the analysis presented in this attachment, in the tables and figures below.
   - **POLA/POLB Air Monitoring Stations -** The Ports of Los Angeles and Long Beach operate six additional monitoring stations for one in three day 24-hour average $PM_{2.5}$ and $EC_{2.5}$ (EC) readings, among other pollutants and meteorological parameters. The POLA monitors began collecting data in February of 2005, so these data do not fully overlap Year 2 of the MATES III study. However, the POLB monitors did not begin operation until December 2006, which is after completion of the MATES III monitoring. Nonetheless, using results from the Ports' air monitoring stations can help give a better understanding of air quality near the Ports and coastal areas and to help evaluate the uncertainties associated with the monitoring data used in MATES III. This is especially true as DPM is a major risk-driver in this study and the port area was identified by MATES III as an area with higher than average risk in the basin. Given the focus of comments in the MATES III study on DPM and the port area, ENVIRON has included available POLA/POLB data within the closest timeframe of the MATES III study for comparison in the tables and figures below.

For this evaluation, ENVIRON reviewed the data from nearby CARB and POLA/POLB air monitoring stations that were operating during the same (or closest similar) time period as the monitoring conducted at the MATES III fixed stations. As can be seen in Figure 1-1, there are many additional monitors in the Basin that collected data that could be used in analyzing the MATES III study. This is most apparent around the San Pedro Bay Ports and the BNSF Wilmington Yard where four POLA, two POLB, and one CARB station (South Long Beach) collected data relevant to the MATES III analysis (e.g., $PM_{2.5}$ and/or EC), as shown in Figures 1-1 to 1-6.

The focus of this initial evaluation is on data most relevant to the evaluation of DPM such as the monitoring data for $PM_{2.5}$ and EC that was collected near the BNSF Wilmington, Commerce/Hobart, and San Bernardino Railyards. ENVIRON evaluated three different aspects of this data. First, we evaluated how the annual average $PM_{2.5}$ data compared to ambient air quality standards and how this data compared between the different data sets (i.e., from MATES III, CARB, and POLA/POLB). Second, we evaluated the annual average EC data collected by the Ports' monitors for comparison to MATES III EC data. Finally, we evaluated whether seasonal patterns were apparent in the more discrete 24-hour EC data.

1.1 Comparison to Ambient Air Quality Standards

ENVIRON began the evaluation of monitoring data near the BNSF railyards by examining how $PM_{2.5}$ (which includes contributions from DPM) measurements acquired by monitors near the railyards and Port areas compare to ambient air quality standards. Table 1-3 summarizes the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$. Tables 1-4a to 1-4c and 1-5a to 1-5c display air monitoring results of the air monitoring stations in the vicinity of the three railyards. These tables summarize the annual average $PM_{2.5}$ concentrations as well as maximum and minimum recorded 24-hour averages for each year. These tables display the annual average concentration for the nearest full year of data to the MATES III Study Years, with data from 2004-2007.

BNSF Wilmington Railyard and nearby Port Areas

What is striking about the information presented in Tables 1-4a and 1-5a is that Port monitors located at or nearby port operations do not show exceedances of the annual NAAQS and only half show exceedances of the annual CAAQS in contrast to the MATES III stations (Wilmington and North Long Beach) that show exceedances of both standards.

Data from the non-MATES III stations (Tables 1-4 and 1-5) are all also consistently lower than the values reported by the two MATES III stations near BNSF Wilmington and the Ports (Wilmington and North Long Beach). This trend is most clearly seen in Year 2 data (Table 1-5) where POLA-reported annual average $PM_{2.5}$ and maximum 24-hour $PM_{2.5}$ concentrations are between 23 to 45% and 30 to 50% lower, respectively, than seen at the Wilmington-MATES III station. A similar trend is also apparent in the values for the North Long Beach station, where CARB and MATES III monitors were co-located. The CARB

results (which are based on more frequent measurements than the MATES III data), are 5% lower than values reported in MATES III for the same station. A direct comparison to data collected at the POLB monitors can not be performed since the data were collected after the end of Year 2. However, the eight months of data collected at these monitors show similar trends to those recorded at the POLA stations.

Figure 1-2 includes wind roses for local meteorological stations around POLA/POLB where wind speed and wind direction data were available. These windroses help analyze wind patterns and possible emission sources and air dispersion trends using multiple years of data, where available, to indicate overall trends. For most stations near BNSF Wilmington, the wind is predominantly from the northwest and secondarily from offshore (generally from the south). The annual average $PM_{2.5}$ concentrations measured at meteorological stations near the BNSF Wilmington Yard are provided in Figures 1-3 and 1-4 for Year 1 and 2, respectively. If the on-port sources are the predominant source of $PM_{2.5}$ in the local area, one might expect to see concentrations of $PM_{2.5}$ increase as you move northward over an increasingly larger portion of Port operations. However, as shown in Figures 1-3 and 1-4, the most northern Port monitors have measured lower annual average $PM_{2.5}$ concentrations than stations located near terminal operations in the harbor. Significantly, all Ports monitors show lower annual average $PM_{2.5}$ concentrations than the values reported for the MATES III stations near the Ports.

The 2005 POLA annual average $PM_{2.5}$ and maximum 24-hour $PM_{2.5}$ concentrations are between 20 to 45% and 45 to 65% lower, respectively, than seen at the Wilmington-MATES III station for Year 1 (see Table 1-4). Although the MATES Year 1 data were only collected for part of 2005, these differences appear real as the CARB reported 2005 annual average $PM_{2.5}$ and maximum 24-hour $PM_{2.5}$ concentrations that were only 15% and 12% lower, respectively, than reported from the North Long Beach-MATES III station during Year 1.

BNSF Commerce/Hobart

Another trend is evident around the BNSF Commerce/Hobart Yards, as shown in Tables 1-4b and 1-5b. When comparing 2005 CARB data with Year 1 MATES III data, the MATES III $PM_{2.5}$ concentrations are consistently higher, with 16% higher recorded annual average $PM_{2.5}$ concentrations than the CARB counterparts. However, the large spatial distribution in monitors limits our ability to draw direct conclusions regarding source-specific impacts in this area. Figures 1-7 and 1-8 show annual average $PM_{2.5}$ concentrations for Year 1 and Year 2 of the MATES III study, for stations around BNSF Commerce/Hobart.

BNSF San Bernardino

BNSF San Bernardino is surrounded by two fixed scale MATES III stations, 1 micro-scale station (San Bernardino), and 2 CARB stations. Figures 1-9 and 1-10

show annual average $PM_{2.5}$ concentrations for Year 1 and Year 2 of the MATES III study for stations around BNSF San Bernardino. As can be seen in the figures, the measured $PM_{2.5}$ concentrations are higher upwind of the BNSF San Bernardino Yard than downwind. Although the San Bernardino micro-scale station operated only in winter of 2005 for one month, when $PM_{2.5}$ levels are the highest, the micro-scale station has much lower measured values than the fixed stations. The micro-scale stations are meant to help validate the data from the fixed stations, but in this case readings are on average 50% lower for $PM_{2.5}$. This may be explained in part by seasonal variations in $PM_{2.5}$ levels or by differing meteorological conditions. As seen consistently in comparison between CARB and MATES III monitoring data sets, CARB Fontana station results from 2006 were 19% lower than those measured at the Fontana MATES III station in Year 2.

All of these observations indicate that more immediate sources of $PM_{2.5}$ emissions may be influencing these monitors to a greater degree than sub-regional sources such as port or goods movement operations. Further study is warranted to evaluate potential source contribution to these monitors. This study could be similar to the localized studies performed in MATES II to evaluate more localized "hotspots." Without these additional studies or further evaluation of these potential inconsistencies, drawing conclusions on whether the PM and EC concentrations at monitors near the Port or other goods movement operations are due to the sub-regional impacts from these operations or due to a more localized specific source can not be made. This also indicates that conclusions in the Report about the impact of port sources on locations distant from the Ports (such as in Central Los Angeles, or even further downwind) may need to be re-considered. At the very least, the uncertainty in measured concentrations noted above and the inability to draw more definitive conclusions on source contributions to individual monitors should be discussed in the final MATES III report.

Table 1-3: National & California Ambient Air Quality Standards

	Averaging Time	PM2.5 (ug/m^3)
CAAQS[1]	Annual	12
	24-Hr	--
NAAQS[2]	Annual	15
	24-Hr	35

Notes
There is no separate 24-hour $PM_{2.5}$ standard in California.
CAAQS = California Ambient Air Quality Standards
NAAQS = National Ambient Air Quality Standards

[1] CAAQS: http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm
[2] NAAQS: http://epa.gov/air/criteria.html

Table 1-4a: Air Monitoring Data Comparison near BNSF Wilmington Railyard, PM2.5 (2005) -- MATES III Study, Year 1

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	Exceeds Annual NAAQS Standard?	Exceeds Annual CAAQS Standard?	Max 24-hr Average Concentration	Min 24-hr Average Concentration
BNSF Wilmington Rail Yard								
St Peter and Paul School	2005	PM2.5	POLA	13.1		YES	32.7	3.3
Berth 47	2005	PM2.5	POLA	10.3			25.3	1.9
Liberty Hill Plaza	2005	PM2.5	POLA	10.8			25.7	1.9
Terminal Island Treatment Plant	2005	PM2.5	POLA	14.7		YES	31.4	2.5
North Long Beach	2005	PM2.5	CARB	15.6	YES	YES	53.9*	3.2
Long Beach-East Pacific Coast Highway	2005	PM2.5	CARB	14.7		YES	50.8*	1.3
North Long Beach	Year 1	PM2.5	MATES III	18.5	YES	YES	61.1*	4.4
Wilmington	Year 1	PM2.5	MATES III	18.4	YES	YES	60.3*	5.7

* Concentrations are higher than the level of the NAAQS, but may not indicate NAAQS exceedences based on the form of the standard.

Table 1-4b: Air Monitoring Data Comparison near BNSF Commerce and Hobart Railyards, PM2.5 (2005) -- MATES III Study, Year 1

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	Exceeds Annual NAAQS Standard?	Exceeds Annual CAAQS Standard?	Max 24-hr Ave Concentration (if Available)	Min 24-hr Ave Concentration (if Available)
BNSF Commerce Rail Yard								
Los Angeles-North Main	2005	PM2.5	CARB	17.8	YES	YES	73.7*	3.5
Lynwood	2005	PM2.5	CARB	17.7	YES	YES	54.6*	3.8
Pico Rivera	2005	PM2.5	CARB	16.0	YES	YES	51.4*	3.3
Pico Rivera	Year 1	PM2.5	MATES III	20.7	YES	YES	64.9*	4.9
Los Angeles-North Main	Year 1	PM2.5	MATES III	19.4	YES	YES	68.4*	5.4
Commerce	Year 1	PM2.5	MATES III	19.6	YES	YES	60.4*	6.9
Compton	Year 1	PM2.5	MATES III	19.5	YES	YES	57.5*	3.5
Huntington Park	Year 1	PM2.5	MATES III	22.4	YES	YES	77.9*	5.0

* Concentrations are higher than the level of the NAAQS, but may not indicate NAAQS exceedances based on the form of the standard.

Table 1-4c: Air Monitoring Data Comparison near BNSF San Bernardino Railyard, PM2.5 (2005) -- MATES III Study, Year 1

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	Exceeds Annual NAAQS Standard?	Exceeds Annual CAAQS Standard?	Max 24-hr Ave Concentration (if Available)	Min 24-hr Ave Concentration (if Available)
BNSF San Bernardino Rail Yard								
Rubidoux	Year 1	PM2.5	MATES III	23.4	YES	YES	90.7*	3.5
San Bernardino[1]	January 2005	PM2.5	MATES III-micro	13.5[1]		N/A[1]	26.9*	4.5
Fontana	Year 1	PM2.5	MATES III	21.4	YES	YES	102.2*	2.8

* Concentrations are higher than the level of the NAAQS, but may not indicate NAAQS exceedances based on the form of the standard.
[1]San Bernardino MATES III micro station only monitored PM2.5 for one month; from January 16, 2005 – February 15, 2005. This station was set up in conjunction with the Fontana fixed site location.
Notes
MATES III Study: Year 1 = April 2004 - March 2005
POLA Air Monitoring started in February 2005, annual average based on first available year of data.

Table 1-5a: Air Monitoring Data Comparison near BNSF Wilmington Railyard, PM2.5 (2006) -- MATES III Study, Year 2

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	Exceeds Annual NAAQS Standard?	Exceeds Annual CAAQS Standard?	Max 24-hr Ave Concentration (if Available)	Min 24-hr Ave Concentration (if Available)
BNSF Wilmington Rail Yard								
St Peter and Paul School	Year 2	PM2.5	POLA	13.0		YES	34.6	3.0
Liberty Hill Plaza	Year 2	PM2.5	POLA	10.9			25.7	1.6
Terminal Island Treatment Plant	Year 2	PM2.5	POLA	14.1		YES	31.4	2.5
Berth 47	Year 2	PM2.5	POLA	10.3			25.9	1.3
Gull Park	2007	PM2.5	POLB	10.9			37.2*	2.6
Super Block	2007	PM2.5	POLB	14.1		YES	38.3*	1.8
North Long Beach	Year 2	PM2.5	CARB	15.4	YES	YES	49.8*	4.3
North Long Beach	Year 2	PM2.5	MATES III	17.2	YES	YES	55.8*	3.7
Wilmington	Year 2	PM2.5	MATES III	18.3	YES	YES	49.7*	4.8

Table 1-5b: Air Monitoring Data Comparison near BNSF Commerce and Hobart Railyards, PM2.5 (2006) -- MATES III Study, Year 2

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	Exceeds NAAQS Standard?	Exceeds CAAQS Standard?	Max 24-hr Ave Concentration (if Available)	Min 24-hr Ave Concentration (if Available)
BNSF Commerce Rail Yard								
Los Angeles-North Main	2006	PM2.5	CARB	15.6	YES	YES	45.7*	3.4
Lynwood	2006	PM2.5	CARB	16.7	YES	YES	55.0*	4.1
Pico Rivera	2006	PM2.5	CARB	16.7	YES	YES	72.2*	4.3
Compton	Year 2	PM2.5	MATES III	17.7	YES	YES	--	--
Pico Rivera	Year 2	PM2.5	MATES III	21.1	YES	YES	71.0*	6.8
Los Angeles-North Main	Year 2	PM2.5	MATES III	18.0	YES	YES	54.5*	5.1
Huntington Park	Year 2	PM2.5	MATES III	14.4		YES	26.7	5.8
Commerce	Year 2	PM2.5	MATES III	14.5		YES	26.3	5.5

Table 1-5c: Air Monitoring Data Comparison near BNSF San Bernardino Railyard, PM2.5 (2006) -- MATES III Study, Year 2

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	Exceeds Annual NAAQS Standard?	Exceeds Annual CAAQS Standard?	Max 24-hr Ave Concentration (if Available)	Min 24-hr Ave Concentration (if Available)
BNSF San Bernardino Rail Yard								
Fontana-Arrow Highway	2006	PM2.5	CARB	17.5	YES	YES	52.6*	2.8
San Bernardino-4th Street	2006	PM2.5	CARB	17.9	YES	YES	55.0*	2.7
Rubidoux	Year 2	PM2.5	MATES III	22.4	YES	YES	110.2*	2.1
Fontana	Year 2	PM2.5	MATES III	21.6	YES	YES	112.4*	5.3

* Concentrations are higher than the level of the NAAQS, but may not indicate NAAQS exceedances based on the form of the standard.

Notes

MATES III Study: Year 2 = April 2005 - March 2006

POLB data are limited to 8-month monitoring period (December 2006 - July 2007)

1.2 Comparison to EC Data nearby the Railyards

In addition to the $PM_{2.5}$ data, ENVIRON evaluated the $EC_{2.5}$ data collected by the Ports' monitors for comparison to MATES III EC data. Tables 1-6 and 1-7 display air monitoring results of the air monitoring stations surrounding the Ports for the annual average EC concentrations as well as maximum and minimum recorded 24-hour averages for each year. These tables display the average concentrations for the nearest full year of data to the MATES III Study Years, with data from 2004-2007 available. Figures 1-5 and 1-6 show annual average EC concentrations for Year 1 and Year 2 of the MATES III study, for stations around BNSF Wilmington. Aside from the Los Angeles-North Main station, which had a co-located CARB station, EC data from the vicinity of BNSF Commerce/Hobart and BNSF San Bernardino came exclusively from the MATES III study so comparisons to non-MATES III data sets is not possible. However, the Los Angeles-North Main monitors provided similar results at both MATES III and CARB monitoring stations.

One interesting observation of the annual average data presented in Tables 1-6 and 1-7 and the spatial placement of those data in Figures 1-5 and 1-6, is the similarity of monitored results for groups of stations; these results appear to be counter-intuitive considering the prevailing winds near the Ports. Similar to the discussion above in ENVIRON's evaluation of the $PM_{2.5}$ data, if the Ports are the dominant sub-regional source of EC in the local area, then one might expect to see concentrations of EC increase as you move northward over an increasingly larger portion of Port operations. As shown in Figures 1-5 and 1-6, the highest monitored MATES III EC concentrations nearby the Ports are consistently at the Wilmington MATES III station. However, the Wilmington annual average EC data is more consistently similar with Port monitors located in the middle of on-port operations, i.e., Terminal Island Treatment Plant and Super Block, rather than with the more northern Port monitors. For example, Port monitors at or just past the boundaries of the Ports (St. Peter and Paul School, Liberty Hill Plaza, and Gull Park) are more similar to the EC concentrations seen at the North Long Beach MATES III Station, which is about 30% lower than the Wilmington station.

The observations described above in addition to those discussed in the preceding section on $PM_{2.5}$, lend support to the premise that more immediate sources of DPM emissions may be influencing these monitors to a greater degree than sub-regional impacts from port operations. As noted previously, further study (potentially similar to those conducted to evaluate localized sources in MATES II) is warranted to evaluate potential source contribution to these monitors. Without these additional studies or further evaluation of these apparent inconsistencies, drawing conclusions on whether the monitors near the Port or goods movement operations are due to the sub-regional impacts from these operations or due to a more localized specific source(s) can not be made. At the very least, the uncertainty in measured concentrations and the inability to draw more definitive conclusions on source contributions to individual monitors should be discussed in the final MATES III report, as source attribution information is an important piece of data used for risk management decisions.

Table 1-6: Air Monitoring Data Comparison near BNSF Wilmington Railyard Elemental Carbon (2005) - MATES III Study, Year 1

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	24-Hr Max Concentration (ug/m3)	24-Hr Min Concentration (ug/m3)
BNSF Wilmington Rail Yard						
St Peter and Paul School	2005	EC	POLA	1.43	5.20	0.00
Liberty Hill Plaza	2005	EC	POLA	1.44	6.70	0.10
Terminal Island Treatment Plant	2005	EC	POLA	2.46	8.10	0.20
North Long Beach	Year 1	DPM	MATES III	2.47	--	--
Wilmington	Year 1	DPM	MATES III	3.35	--	--
North Long Beach	Year 1	EC-PM2.5	MATES III	1.46	5.99	0.04
Wilmington	Year 1	EC-PM2.5	MATES III	2.03	8.40	0.02
Berth 47	2005	EC	POLA	0.98	3.70	0.10

Table 1-7: Air Monitoring Data Comparison near BNSF Wilmington Railyard, Elemental Carbon (2006) - MATES III Study, Year 2

Site Name	Year	Pollutant	Data Source	Annual Average Concentration (ug/m3)	24-Hr Max Concentration (ug/m3)	24-Hr Min Concentration (ug/m3)
BNSF Wilmington Rail Yard						
St Peter and Paul School	Year 2	EC	POLA	1.56	5.20	0.00
Liberty Hill Plaza	Year 2	EC	POLA	1.52	6.70	0.20
Terminal Island Treatment Plant	Year 2	EC	POLA	2.52	9.30	0.20
Berth 47	Year 2	EC	POLA	1.07	4.60	0.10
North Long Beach	Year 2	EC-PM2.5	MATES III	1.49	5.27	0.35
Gull Park	2007	EC-PM2.5	POLB	1.57	6.62	0.09
Super Block	2007	EC-PM2.5	POLB	2.61	10.84	0.34
Wilmington	Year 2	EC-PM2.5	MATES III	2.12	8.78	0.31

Notes
MATES III Study: Year 2 = April 2005 - March 2006
POLB Data is limited to 8-month monitoring period (December 2006 - July 2007)

1.3 Evaluation of Seasonal Patterns

At the March 13, 2008 TAG meeting, several significant technical issues were raised. One TAG comment explored by ENVIRON is the potential impact of higher EC emissions from spark-ignited engines at lower temperatures (below 70 degrees Fahrenheit). These differences in EC emissions could be reflected in seasonal trends, and if not appropriately accounted for, could affect the conclusions of the MATES III

Report. To analyze this question, Figures 1-7 and 1-8 present graphs of the temporal variations in 24-hour average EC measurements from all MATES III stations and specific BNSF Wilmington and Port area air monitoring stations, respectively. These graphs show temporal trends in EC concentrations that may be due to varying operations throughout the year, meteorology (e.g., lower mixing heights in the fall / winter) or to variations in exhaust profiles in colder months (i.e.., greater contribution of spark-ignited EC in colder months). As shown in Figures 1-11 and 1-12, measured EC concentrations are roughly two times higher in the winter months when temperatures are consistently below 70 degrees Fahrenheit (between October and February) than in the warmer summer months. If spark-ignited engines are a proportionally greater contributor to EC emissions during winter months, the MATES III study may be overestimating the contribution of DPM to EC (and hence, to DPM risk) given that MATES III does not currently address the seasonality of the EC ratio between diesel and spark-ignited engines. Further study and analysis of this issue is critical given that source attribution information is an important piece of data used for risk management decisions. Further, some of the conclusions of the MATES III report could change if this issue is evaluated and incorporated into the revised MATES III report.

2. **Lack of Agreement in Air Monitoring Data and CMB Results**
The MATES III results suggest that total reconstructed $PM_{2.5}$ levels using CMB and either of the gasoline profiles used by SCAQMD are consistently higher than measured levels at all ten sites. Except in three instances, $PM_{2.5}$ levels predicted using CMB were 1% to 18% higher (Table 1-8). Most notably, the Wilmington site has both the highest overestimated value (18% using the NFRAQS profile in year 1) and highest average overestimation over the two years and two profiles (11%). As described in more detail in our comments on the CMB method (see Attachment B), some of the mass associated with the various source categories may be overestimated, and this applies especially to any carbon-rich sources, such as diesel, gasoline, biomass burning, meat cooking, and oil burning. Any overestimation of DPM mass would result in a direct and corresponding overestimate of DPM-associated risk. This is a particular concern at the Wilmington station given it's proximity to the BNSF Wilmington Railyard, and the identification in MATES III of the Wilmington/Ports locale as sustaining the highest risk levels in the entire South Coast Air Basin.

Table 1-8: Comparison of CMB Predicted versus Measured Ambient $PM_{2.5}$ Concentrations in MATES III Study[1]										
NFRAQS Gasoline Profile (Year 1) [Appendix VII - Table 1]										
Station	Wilmington	N. Long Beach	Compton	Huntington Park	Los Angeles	Pico Rivera	Burbank	Anaheim	Fontana	Rubidoux
Predicted	20.94	19.59	21.91	23.85	21.2	21.98	21.55	18.2	22.64	22.93
Measured	17.72	18.41	19.34	22.2	19.38	20.6	21.21	17.55	21.35	23.54
% Difference (Predicted vs. Measured)	18%	6%	13%	7%	9%	7%	2%	4%	6%	-3%
NFRAQS Gasoline Profile (Year 2) [Appendix VII - Table 3]										
Station	Wilmington	N. Long Beach	Compton	Huntington Park	Los Angeles	Pico Rivera	Burbank	Anaheim	Fontana	Rubidoux
Predicted	19.89	17.88	19.49	--	19.7	--	21.16	17.74	23.07	23.16
Measured	18.1	16.74	17.66	--	17.4	--	19.97	16.8	20.98	21.8
% Difference (Predicted vs. Measured)	10%	7%	10%	--	13%	--	6%	6%	10%	6%
Basin Gasoline Profile (Year 1) [Appendix VII - Table 2]										
Station	Wilmington	N. Long Beach	Compton	Huntington Park	Los Angeles	Pico Rivera	Burbank	Anaheim	Fontana	Rubidoux
Predicted	19.98	18.89	20.83	22.89	20.73	21.42	20.93	17.65	22.33	22.5
Measured	17.72	18.41	19.34	22.2	19.38	20.6	21.21	17.55	21.35	23.54
% Difference (Predicted vs. Measured)	13%	3%	8%	3%	7%	4%	-1%	1%	5%	-4%
Basin Gasoline Profile (Year 2) [Appendix VII - Table 4]										
Station	Wilmington	N. Long Beach	Compton	Huntington Park	Los Angeles	Pico Rivera	Burbank	Anaheim	Fontana	Rubidoux
Predicted	18.96	17.18	18.55	--	19.27	--	20.08	17.25	22.58	22.76
Measured	18.1	16.74	17.66	--	17.4	--	19.97	16.81	20.98	21.8
% Difference (Predicted vs. Measured)	5%	3%	5%	--	11%	--	1%	3%	8%	4%
All Profiles - Years 1 and 2										
Average % Difference (Predicted vs. Measured)	11%	5%	9%	5%	10%	5%	2%	3%	7%	1%

[1] South Coast AQMD, "Multiple Air Toxics Exposure Study: Appendix VII. $PM_{2.5}$ Source Apportionment for the South Coast Air Basin Using Chemical Mass Balance Receptor Model", http://www.aqmd.gov/prdas/matesIII/draft/appVII.pdf (viewed January 22, 2008).

3. Lack of Comparison Between Monitoring and Modeling Results

As described in more detail in ENVIRON's review of the MATES III air quality modeling (see Attachment D), the main text of the study did not fully compare specific monitoring site results to the results predicted by the model at these locations. The modeling appendix to the report, released 3 weeks after the main report, do provide additional detail in this area, but our review of the modeling appendix indicates that it does not contain the level of discussion and detail necessary. As discussed in Attachment D, there appears to be discrepancies between the modeled and monitored risk that should be investigated and explained. In fact, rough comparisons using approximate monitored risk values from Figures 2-17 and 2-18 and modeling results data in Table 4-5 of the study indicate that modeling results at some stations (Burbank, Fontana, and Rubidoux) may be a factor of two lower than results from the monitoring data while other stations (Wilmington and North Long Beach) are overestimated by 10% to 30% than shown by the monitoring results, see Table 4. To address the comparability of the two methods, the modeled and monitored risks (and pollutant concentrations) need to be compared on a station by station basis and any differences between the two should be fully discussed as sources of potential uncertainty in the analysis. However, SCAQMD is just releasing the discrete modeling results (in electronic format) necessary to perform this review. Based on this data further analyses should be conducted to resolve these issues.

Table 1-9: Comparison of Modeled versus Measured Risk Levels in MATES III Study.

Location	2005 Modeled Risks[1]	Monitored Risk			Modeled/ Monitored	Modeled Risk Higher/Lower?
		Year 1[2]	Year 2[3]	Average		
Wilmington	1415	1175	1350	1263	1.12	Higher
Long Beach	1242	900	975	938	1.32	Higher
Compton	973	1100	1200	1150	0.85	Lower
Los Angeles	1268	1100	1450	1275	0.99	Lower
Burbank	645	1200	1400	1300	0.50	Lower
Anaheim	882	800	950	875	1.01	Higher
Fontana	681	1250	1575	1413	0.48	Lower
Rubidoux	545	1000	1300	1150	0.47	Lower

Notes:

1. MATES III: Table 4-5
2. MATES III: Figure 2-17
3. MATES III: Figure 2-18

Additional Note: The stations are grouped by distance from the Ports.

Figure 1-1: Air Monitoring Stations in the South Coast Air Basin.
MATES III Study Comparison
South Coast Air Basin, California

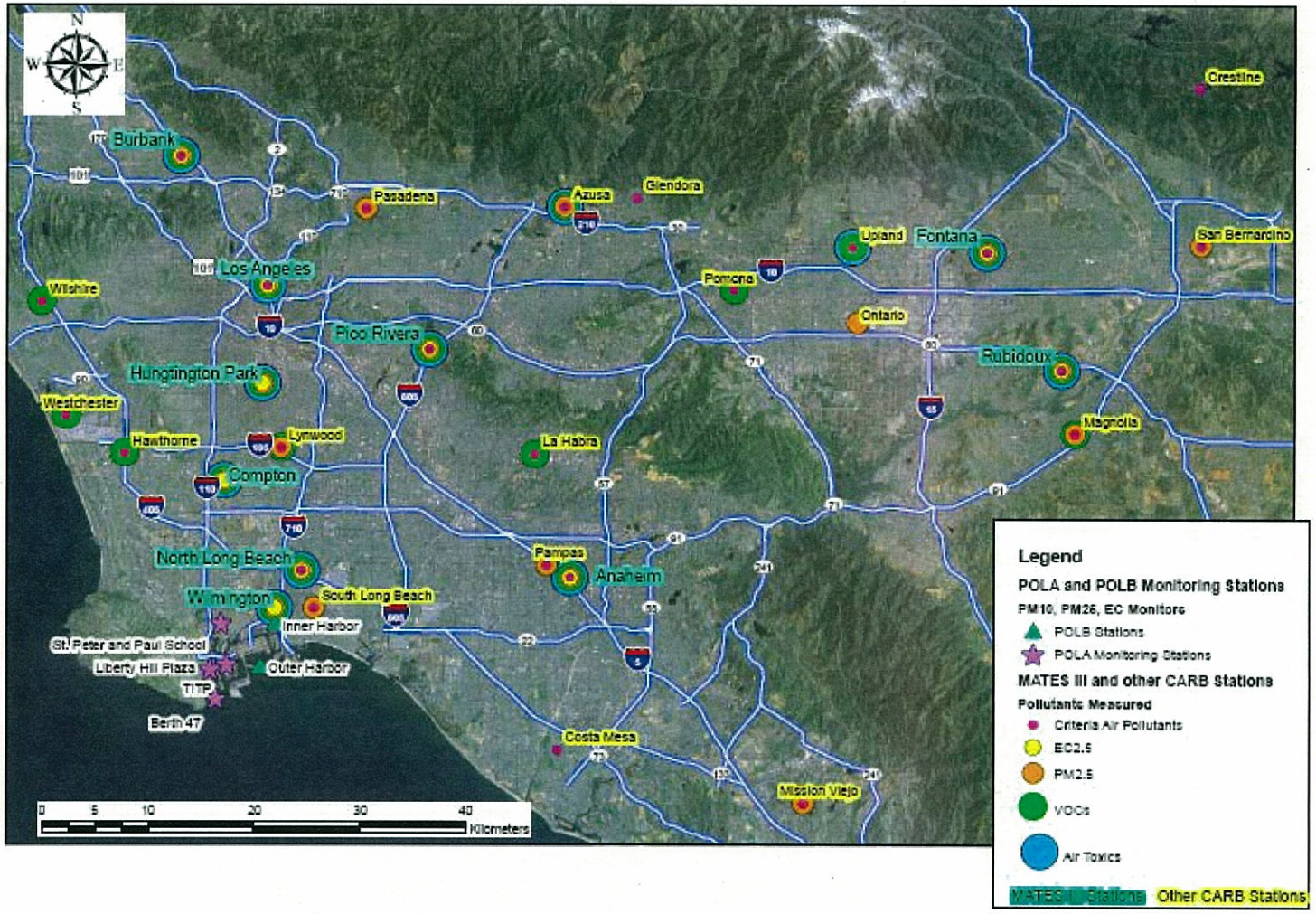

Figure 1-2: Meteorological Stations and Wind Patterns around BNSF Wilmington and San Pedro Bay Ports
MATES III Study Comparison
South Coast Air Basin, California

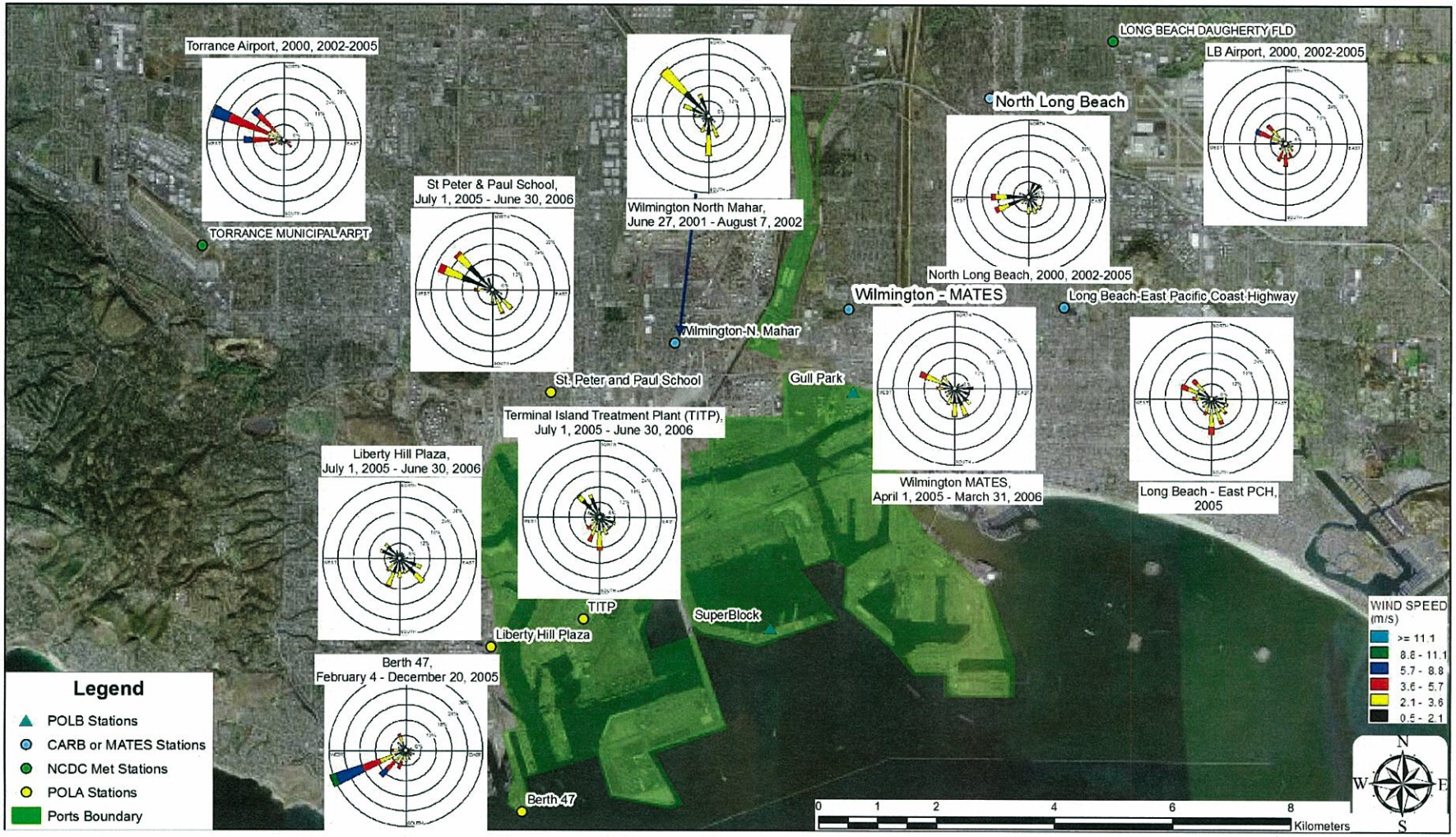

Figure 1-3: Air Monitoring Stations around BNSF Wilmington
PM2.5 Year 1 (2005)
South Coast Air Basin, California

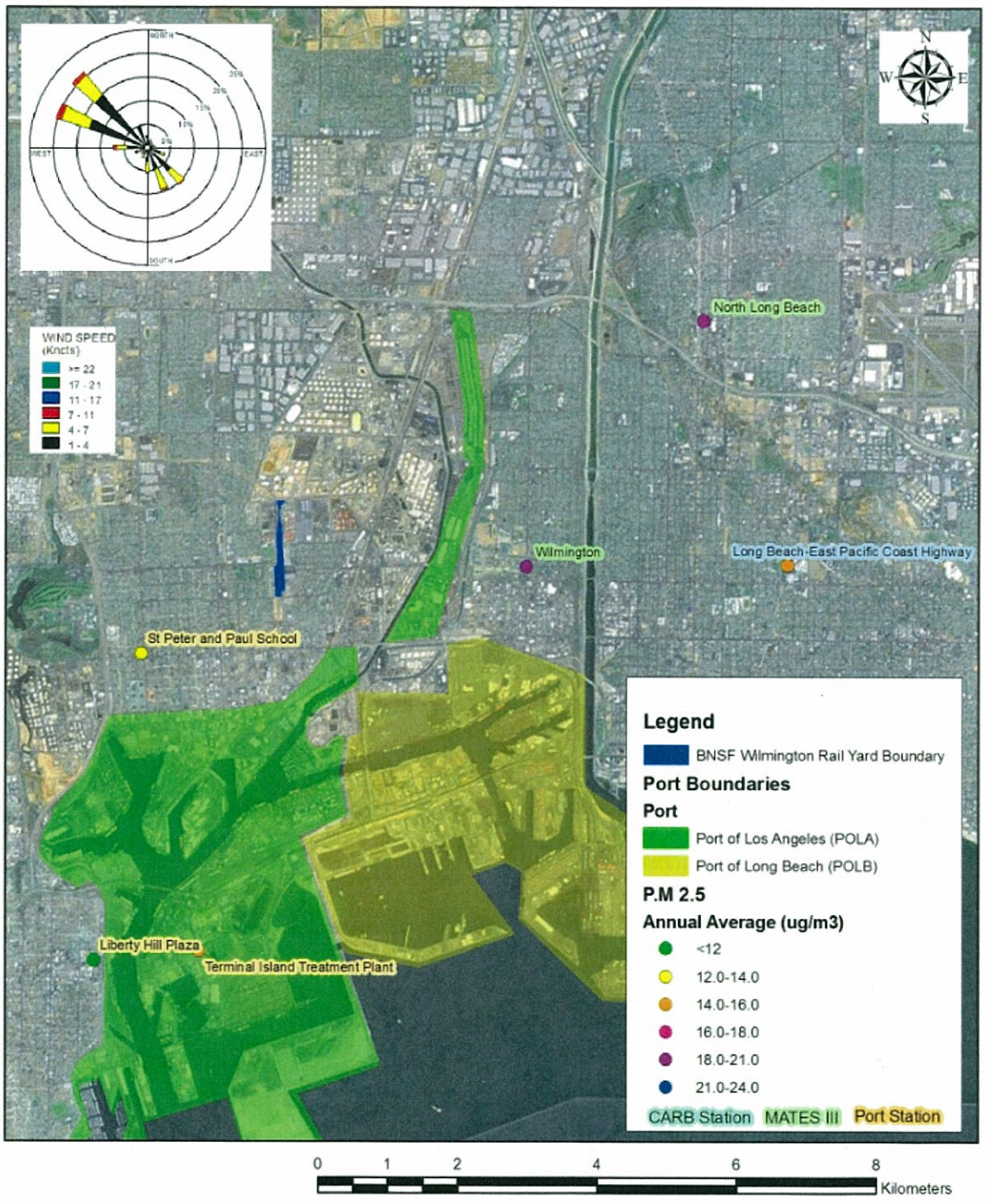

Figure 1-4: Air Monitoring Stations around BNSF Wilmington
PM2.5 Year 2 (2006)
South Coast Air Basin, California

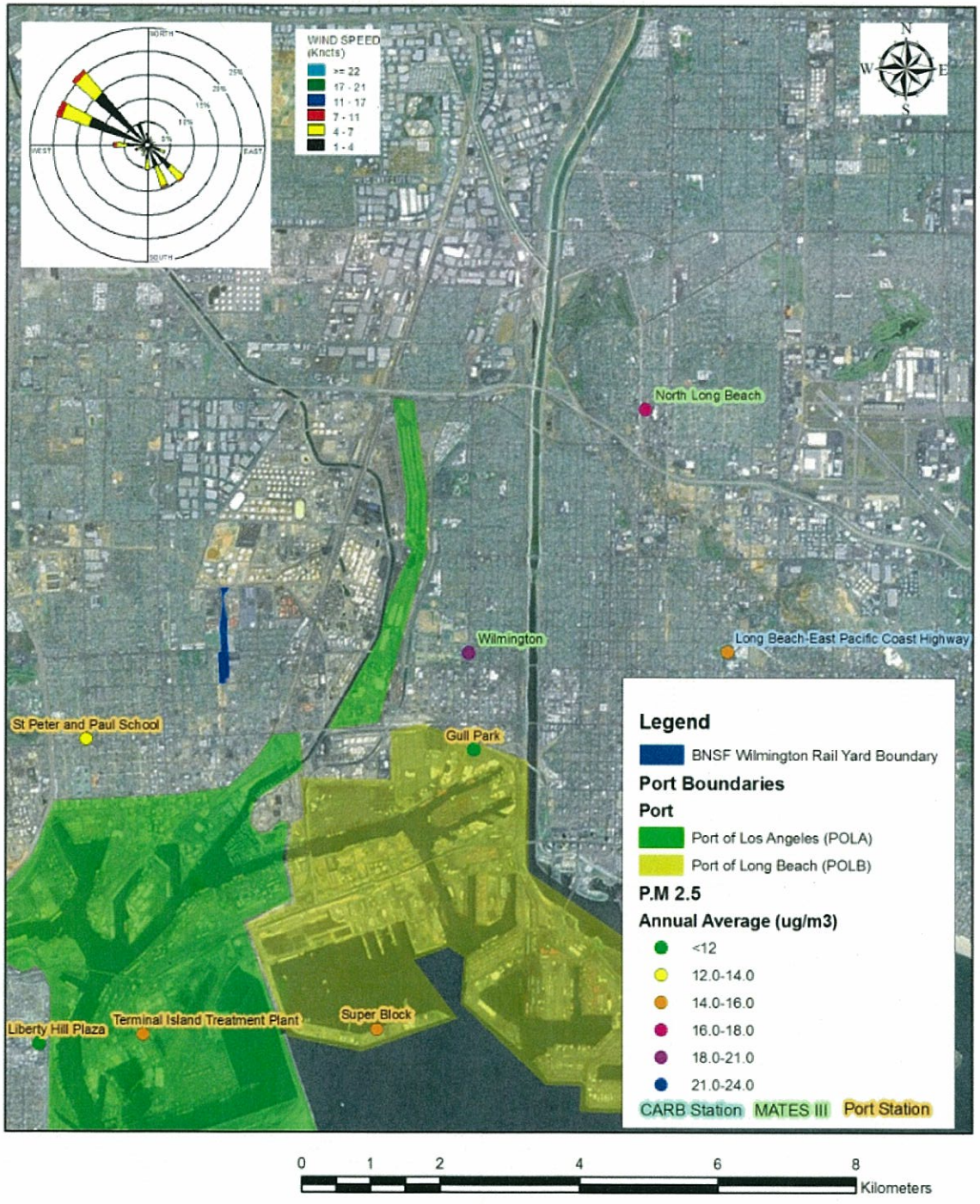

Figure 1-5: Air Monitoring Stations around BNSF Wilmington Railyard
Elemental Carbon, Year 1 (2005)
South Coast Air Basin, California

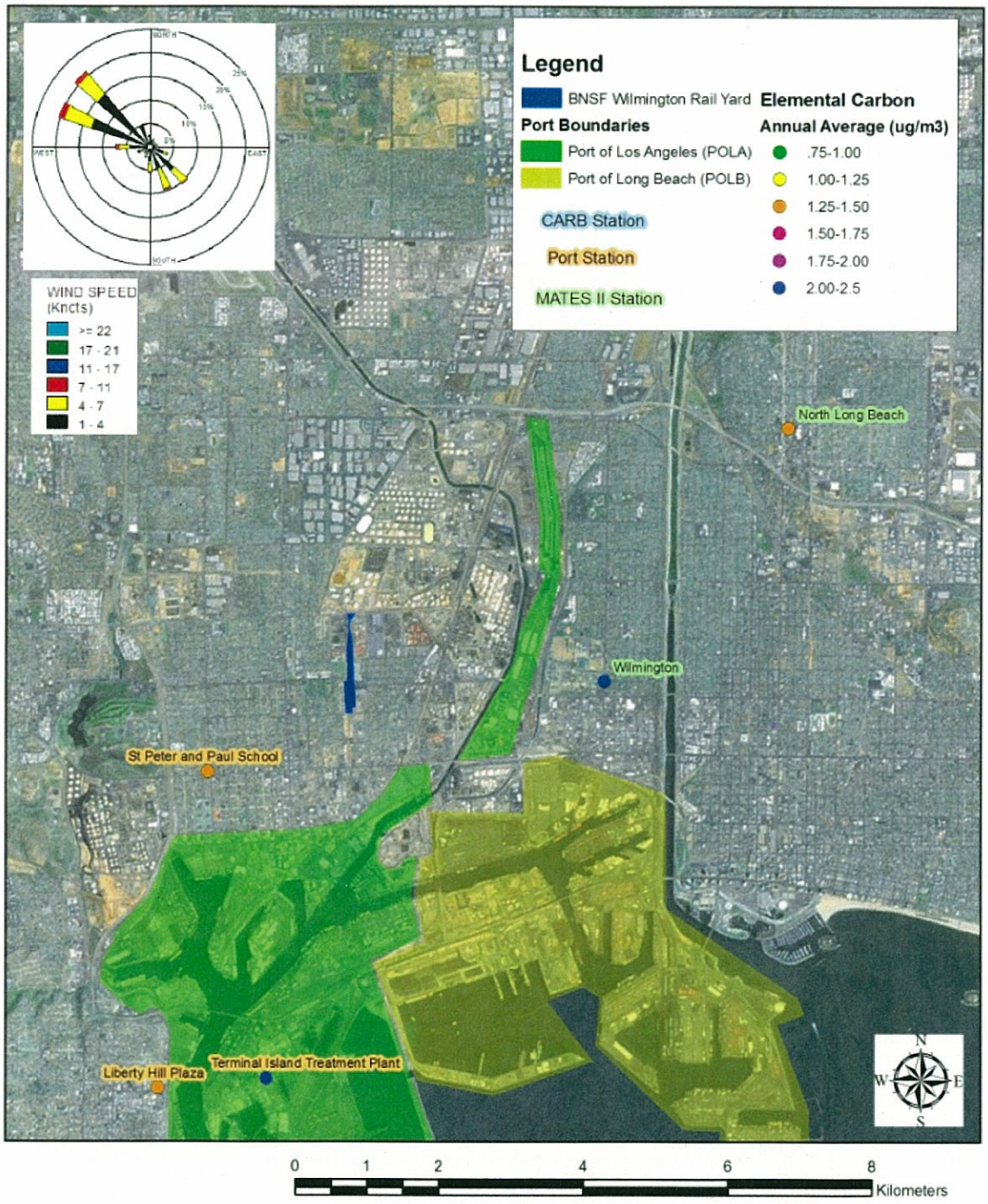

Figure 1-6: Air Monitoring Stations around BNSF Wilmington Elemental Carbon Data Comparison – MATES III Year 2 (2006) South Coast Air Basin, California

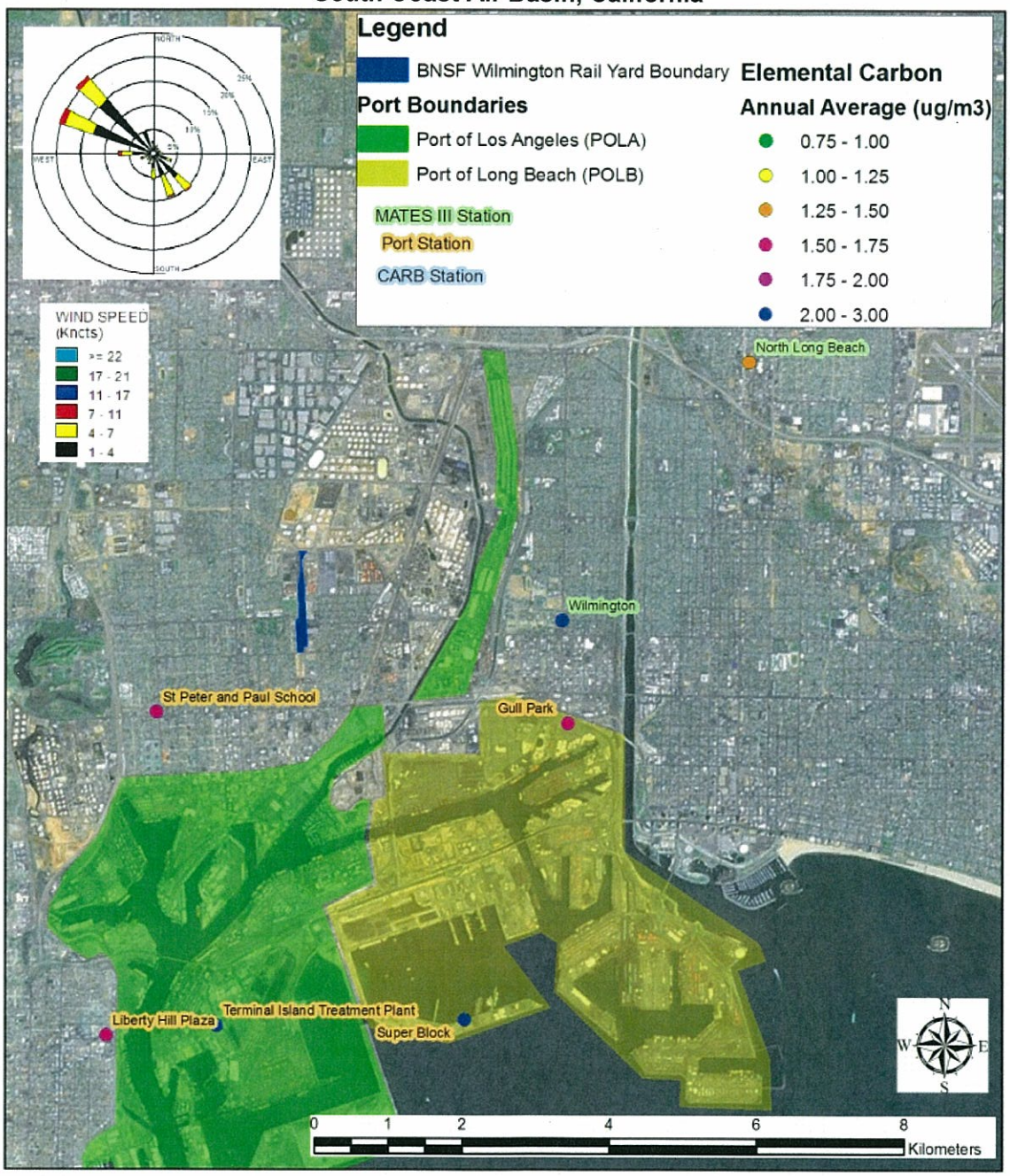

Figure 1-7: Air Monitoring Stations around BNSF Commerce/Hobart Yards
PM2.5 Year 1 (2005)
South Coast Air Basin, California

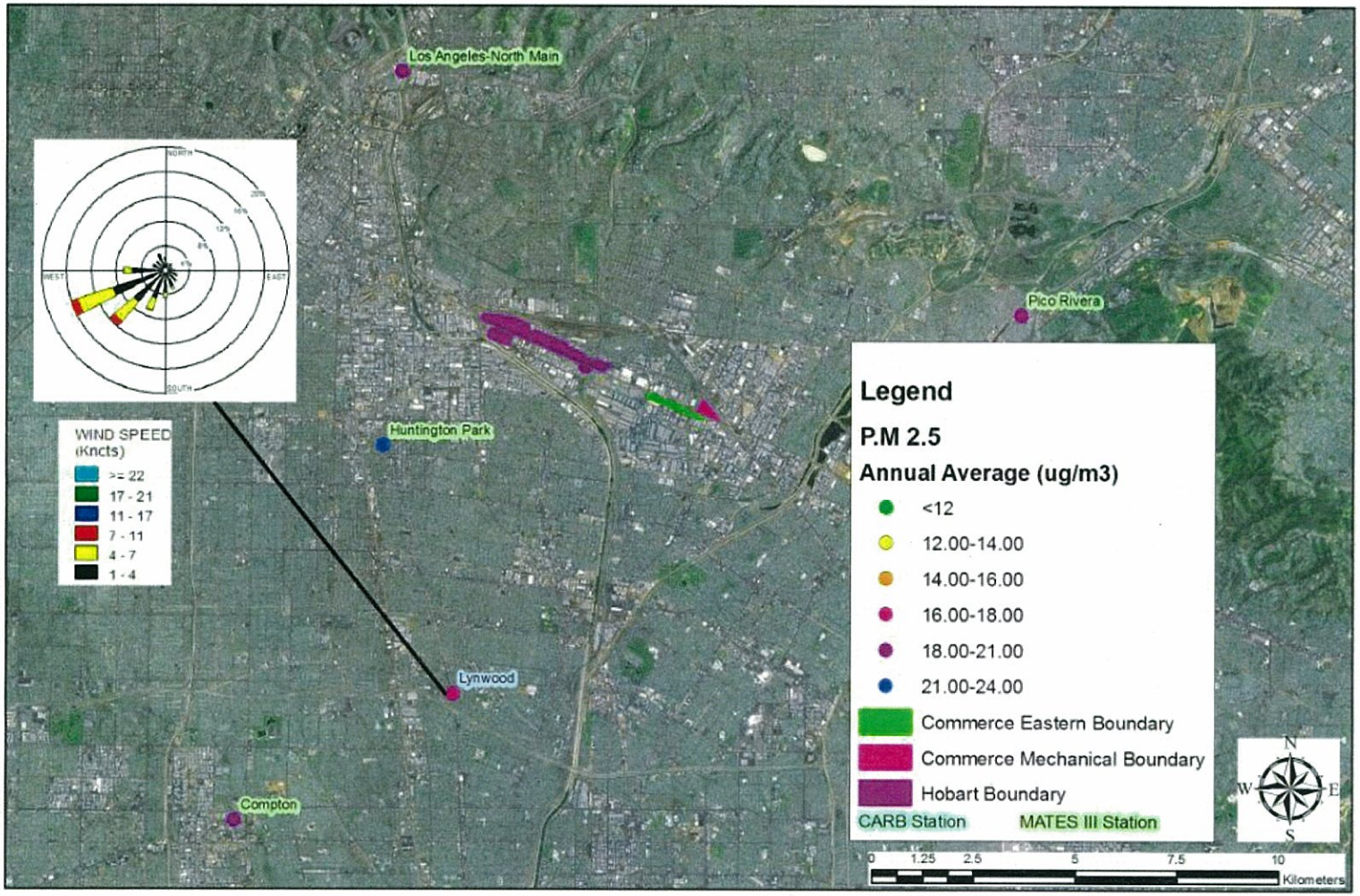

Figure 1-8: Air Monitoring Stations around BNSF Commerce/Hobart Yards
PM2.5 Year 2 (2006)
South Coast Air Basin, California

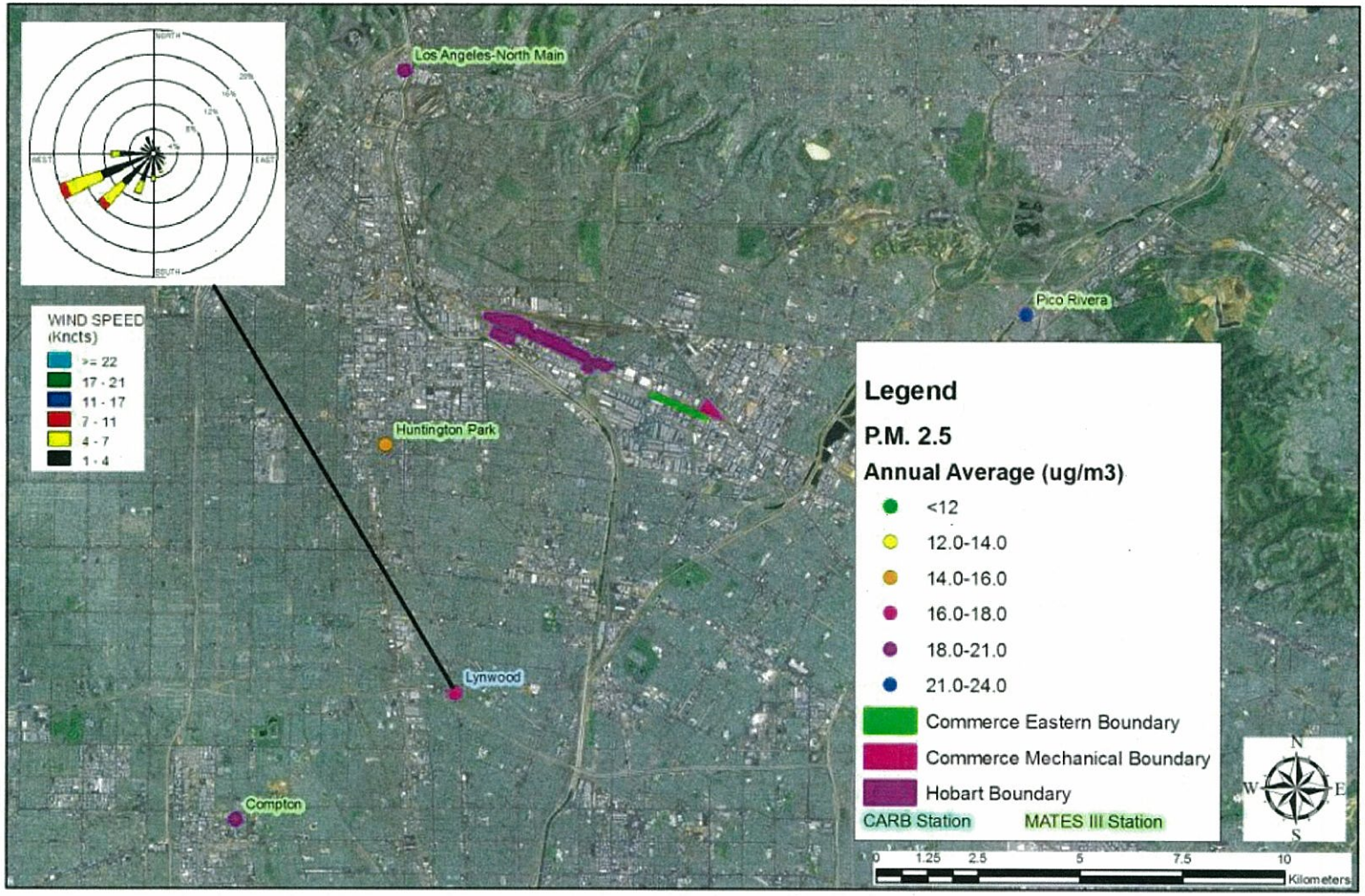

Figure 1-9: Air Monitoring Stations around BNSF San Bernardino
PM2.5 Year 1 (2005)
South Coast Air Basin, California

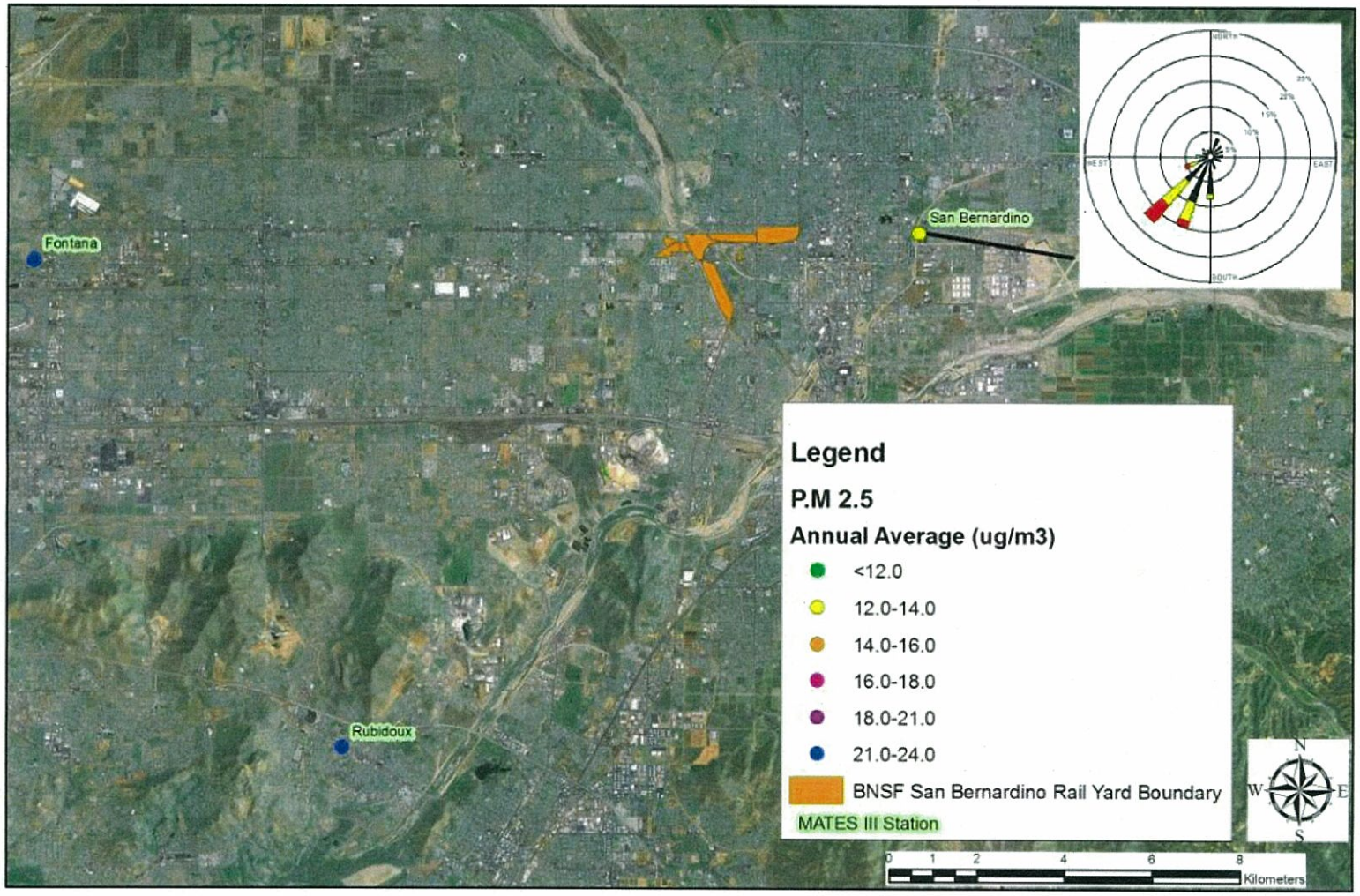

Figure 1-10: Air Monitoring Stations around BNSF San Bernardino
PM2.5 Year 2 (2006)
South Coast Air Basin, California

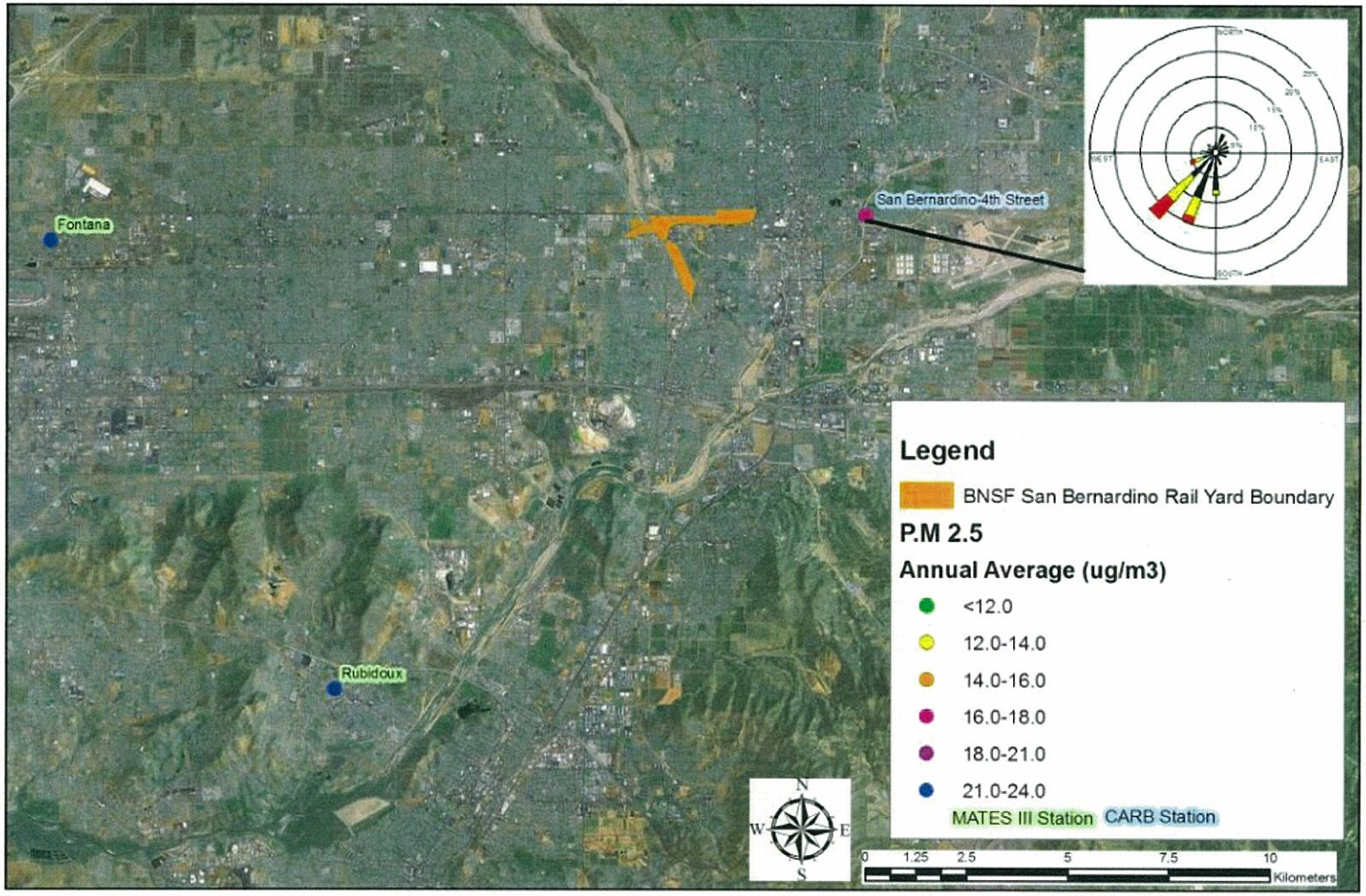

Figure 1-11. Concentration of Elemental Carbon, April 2004 - March 2006 (MATES III Monitoring Stations)

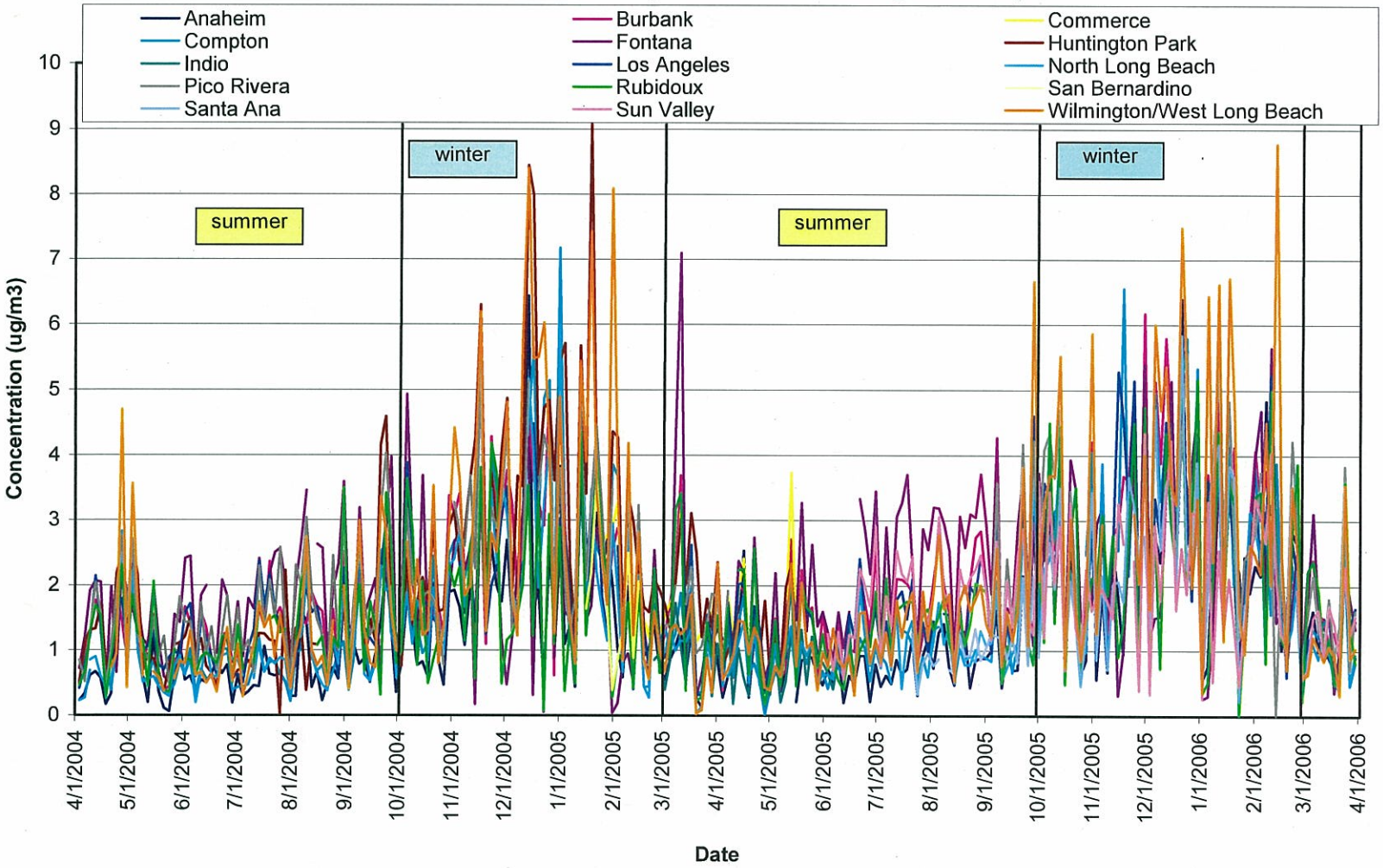

**Figure 1-12. Concentration of Elemental Carbon,
BNSF Wilmington and Port-Area Monitoring Stations (April 2004 - September 2007)**