A. INTRODUCTION

This chapter discusses the potential beneficial and adverse effects of the Cross Harbor Freight Program (CHFP) alternatives on air quality in the study area. To a larger or lesser extent, all of the Build Alternatives would have the potential to ease congestion on existing Hudson River crossings by providing one or more additional routes for freight, as well as making rail and waterborne crossings of the Hudson River and New York Harbor viable and more attractive options. By reducing congestion on existing crossings and roadways, the Build Alternatives would reduce emissions from vehicle idling, resulting in improvements in air quality. The Build Alternatives that would involve rail (Rail Tunnel Alternatives and the Enhanced Railcar Float Alternative) would also provide regional air quality benefits by shifting freight transport from trucks to rail, thereby reducing emissions from truck vehicle miles traveled (VMT) and/or congestion and idling on existing roadways. However, an increase in emissions would result from freight locomotives operating under these same alternatives (Rail Tunnel Alternatives and the Enhanced Railcar Float Alternative); activities at freight facilities, including local truck traffic to and from those facilities (all Build Alternatives); tug boats and ferries (Waterborne Alternatives); and tunnel ventilation shafts (Rail Tunnel Alternatives). The net changes in emissions with the Build Alternatives, as compared to the No Action Alternative, are discussed in Section D. This chapter also discusses the potential effects of project construction on air quality and methods to avoid or minimize potential adverse effects from both construction and operation of the project.

REGULATORY CONTEXT

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act (CAA), primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six "criteria" air pollutants: carbon dioxide (CO), nitrogen dioxide (NO_2), ozone, respirable particulate matter (PM—in two size categories, $PM_{2.5}$ and PM_{10}), sulfur dioxide (SO_2), and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary and secondary standards are the same for NO_2 (annual), ozone, lead, and PM, and there is no secondary standard for CO and the 1-hour NO_2 standard. The NAAQS are presented in **Table 6.6-1**.

The NAAQS for CO, annual NO_2, and 3-hour SO_2 have also been adopted as the ambient air quality standards for New York State, but the annual NO_2 standard is defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particulate matter (TSP), settleable particles, non-methane hydrocarbons (NMHC),

Table 6.6-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	Ppm	µg/m³	Ppm	µg/m³
Carbon Monoxide (CO)				
8-Hour Average (1)	9	10,000	None	
1-Hour Average (1)	35	40,000		
Lead				
Rolling 3-Month Average (2)	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average (3)	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average (4,5)	0.075	150	0.075	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average (1)	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean (6)	NA	12	NA	15
24-Hour Average (7)	NA	35	NA	35
Sulfur Dioxide (SO_2) (8)				
1-Hour Average (9)	0.075	196	NA	NA
Maximum 3-Hour Average (1)	NA	NA	0.50	1,300

Notes:
ppm – parts per million
µg/m³ – micrograms per cubic meter
NA – not applicable
All annual periods refer to calendar year.
Standards are defined in ppm. Approximately equivalent concentrations in µg/m³ are presented.
(1) Not to be exceeded more than once a year.
(2) USEPA has lowered the NAAQS down from 1.5 µg/m³, effective January 12, 2009.
(3) 3-year average of the annual 98th percentile daily maximum 1-hr average concentration.
(4) 3-year average of the annual fourth highest daily maximum 8-hr average concentration.
(5) USEPA has proposed lowering the primary standard further to within the range 0.060-0.070 ppm, and adding a secondary standard measured as a cumulative concentration within the range of 7 to 15 ppm-hours aimed mainly at protecting sensitive vegetation. A final decision on this standard has been postponed but is expected to occur in 2013.
(6) USEPA has lowered the primary standard from 15 µg/m³, effective March 2013.
(7) Not to be exceeded by the annual 98th percentile when averaged over 3 years.
(8) USEPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010.
(9) 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.
Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

and ozone, which correspond to federal standards that have since been revoked or replaced, and for beryllium, fluoride, and hydrogen sulfide (H_2S). The NAAQS for CO, annual NO_2, and the secondary 3-hour SO_2 NAAQS have also been adopted as the ambient air quality standards for New Jersey but are defined on a running 12-month basis rather than for calendar years only. The State of New Jersey also has standards for various other pollutants corresponding to federal standards that have since been revoked or replaced.

NON-CRITERIA POLLUTANTS

In addition to the criteria pollutants discussed above, toxic air pollutants—also known as hazardous air pollutants (HAPs) or mobile source air toxics (MSATs) in the on-road context—are pollutants known to cause or are suspected of causing cancer or other serious health ailments. The Clean Air Act Amendments of 1990 listed 188 HAPs and addressed the need to control toxic emissions from transportation. The U.S. Environmental Protection Agency's (USEPA) 2007 MSAT rule identified a subset of seven HAPs as having significant contributions from mobile sources: benzene, 1,3-butadiene, formaldehyde, acrolein, naphthalene, polycyclic organic matter, and diesel particulate matter (DPM).

Federal ambient air quality standards do not exist for non-criteria pollutants; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for three non-criteria compounds. NYSDEC and the New Jersey Department of Environmental Protection (NJDEP) have also developed short term (1-hour) and annual guideline reference concentrations for numerous non-criteria pollutants (NYSDEC guidance document DAR-1, October 2010, and NJDEP Toxicity Values for Inhalation Exposure, 2011). The NYSDEC and NJDEP reference thresholds for the seven MSATs are presented in **Table 6.6-2**. These thresholds are screening levels only and represent ambient levels that are considered safe for public exposure; however, exceedance of these levels does not necessarily indicate unhealthy conditions.

Table 6.6-2
New York and New Jersey Guidance HAP Concentrations (μg/m³)

Compound	New York(1)		New Jersey (2)	
	Long Term	Short Term	Long Term	Short Term
Benzene	0.13	1,300	0.13	1,300
1,3-butadiene	0.033	none	0.033	none
Formaldehyde	0.060	30	0.077	55
Acrolein	0.35	2.5	0.02	2.5
Naphthalene	3.0	7,900.0	0.029*	none
Polycyclic Organic Matter	0.020 (PAH and other individual POM)	none	0.00091(3)	none
Diesel Particulate Matter+	0.3 as $PM_{2.5}$ (3)	5 as $PM_{2.5}$ (4)	0.0033	none

Notes:
Compounds displayed include only the seven priority MSATs identified by USEPA and Federal Highway Administration (FHWA).
These thresholds are screening levels considered safe for public exposure; however, exceedance of these levels does not necessarily indicate unhealthy conditions.
***** Cancer risk reference level; New Jersey also applies a 3 μg/m³ reference concentration, similar to New York.
\+ Non-cancer effects only.
Sources: 1. NYSDEC, guidance document DAR-1, October 2010.
2. NJDEP, Toxicity Values for Inhalation Exposure, 2011.
3. Based on benzo(a)pyrene data, as recommended by NJDEP.
4. NYSDEC, Policy CP-33, 2003.

NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS

The Clean Air Act Amendments of 1990 define non-attainment areas as geographic regions that have been designated as not meeting one or more of the NAAQS. The attainment status for the 23 counties in the regional study area (illustrated in Figure 5-2 in Chapter 5, "Transportation") is shown in **Table 6.6-3**.

Table 6.6-3
Counties Designated Non-Attainment or Maintenance

County	Ozone*	PM_{10}	$PM_{2.5}$ (Maintenance)	CO (Maintenance)	SO_2**
Kings, NY	✓		✓	✓	
Bronx, NY	✓		✓	✓	
New York, NY	✓	✓	✓	✓	
Richmond, NY	✓		✓	✓	
Queens, NY	✓		✓	✓	
Nassau, NY	✓		✓	✓	
Suffolk, NY	✓		✓		
Rockland, NY	✓		✓		
Westchester, NY	✓		✓	✓	
Putnam, NY	✓				
Ocean, NJ	✓			✓ (City of Toms River)	
Monmouth, NJ	✓		✓	✓ (Borough of Freehold)	
Middlesex, NJ	✓		✓	✓ (City of Perth Amboy)	
Somerset, NJ	✓		✓	✓ (Borough of Somerville)	
Union, NJ	✓		✓	✓	
Hunterdon, NJ	✓				
Hudson, NJ	✓		✓	✓	
Essex, NJ	✓		✓	✓	
Morris, NJ	✓		✓	✓ (City of Morristown)	
Warren, NJ	✓				✓
Bergen, NJ	✓		✓	✓	
Passaic, NJ	✓		✓	✓ (City of Clifton, City of Patterson, City of Passaic)	
Sussex, NJ	✓				

Notes:

* The entire regional environmental analysis study area is moderate non-attainment with the 1997 8-hour ozone standard and, with the exception of Putnam County, marginal non-attainment with the 2008 8-hour ozone. The area was also classified as "Severe-17" non-attainment with the revoked 1-hour ozone standard, with the exception of Warren County, which was classified as being in "Marginal" nonattainment with the 1-hour ozone standard.

** Non-attainment with the former annual and 24-hour primary standards and the 3-hour secondary standards. USEPA has replaced the annual and 24-hour standards with a 1-hour primary SO_2 standard.

When an area is designated as non-attainment by USEPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

CONFORMITY WITH STATE IMPLEMENTATION PLANS

The conformity requirements of the CAA and regulations promulgated thereunder limit the ability of federal agencies to assist, fund, permit, and approve projects in non-attainment areas that do not conform to the applicable SIP. When subject to this regulation, the lead agency is responsible for demonstrating conformity for its proposed action. Conformity to the SIP means that activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant national ambient air quality standards.

The federal transportation conformity regulations (40 CFR § 93 Subpart A) establish the criteria and procedures for determining whether transportation projects developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act conform to the SIP. Transportation conformity applies to the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) projects in nonattainment and maintenance areas for the transportation-related criteria pollutants CO, ozone, NO_2, $PM_{2.5}$, and PM_{10} and some precursor pollutants.

According to the regulations, federal actions whose criteria pollutant emissions have already been included in the local SIP's attainment or maintenance demonstrations are assumed to conform to the SIP.

The New York Metropolitan Transportation Council (NYMTC) is the metropolitan planning organization (MPO, the federally mandated organization responsible for transportation planning in the metropolitan area) for the New York State portion of the regional environmental analysis study area. NYMTC included elements of the CHFP in the Transportation Improvement Plan (TIP) for 2012. The transportation conformity determination for the 2011-2015 TIP and 2010-2035 Regional Transportation Plan was finalized on November 17, 2011. The North Jersey Transportation Planning Authority (NJTPA) is the MPO for the New Jersey portion of the regional environmental analysis study area. The NJTPA also listed portions of the proposed project in its 2012-2015 TIP, including elements of the No Action Alternative—the rehabilitation of two railcar float bridges and associated support infrastructure.

Regional (mesoscale) emissions from phases of the Build Alternatives that have not been included in the conforming transportation plans are considered, as described below to determine their potential effect on air quality.

B. METHODOLOGY

Emissions from motor vehicles are referred to as on-road emissions, while emissions from locomotives, tug boats, ferries, rail facility equipment, and construction equipment are referred to as non-road emissions. In both cases, emissions result from combustion of fuels. On-road emission sources are predominantly gasoline passenger vehicles and diesel trucks. Emissions from locomotives (except electric locomotives, mostly used for passenger service) and tug boats and ferries are almost entirely diesel.

POLLUTANTS OF CONCERN

Criteria pollutants, including CO, PM, and ozone precursors—volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide, NO, and NO_2, collectively referred to as NO_x)—are all emitted from the combustion of both gasoline and diesel fuel. CO is emitted predominantly from gasoline combustion, while NO_x and PM are emitted predominantly from diesel combustion. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs. Since CO, VOC, PM, and NO_x are emitted from both on-road and non-road engines, they have all been included in the mesoscale (regional) assessment for the project alternatives. HAPs are not generally of concern at the regional level, but the likely effect of the project on the most important HAPs was considered.

Emissions of sulfur dioxide (SO_2) are currently associated mainly with stationary, such as power plants and refineries. On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Similarly, non-road diesel federal regulations requiring the phase-out of sulfur in diesel for all non-road uses have been implemented (with minor exceptions to be implemented by 2015).

Therefore, SO_2 from transportation sources in general will not be an issue of concern in the near future. Similarly, lead in gasoline has been banned under the CAA, and, therefore, lead is not a pollutant of concern for the proposed project.

CO, PM, and some HAP concentrations can vary greatly with the distance from the source of emissions and may consequently be locally elevated near crowded intersections, heavily traveled and congested roadways, and parking lots. PM and some HAP concentrations may also be locally elevated near railways and roadways with high volumes of heavy diesel-powered vehicles. In addition to being of regional concern as an ozone precursor, with the promulgation of the 2010 1-hour average standard, NO_2 may become of greater concern at the local scale. As the information required for an analysis of emissions at the local (microscale) level is not available, the potential effects of local emissions of these pollutants will be qualitatively discussed in this Tier I Environmental Impact Statement (EIS) and addressed in more detail in Tier II.

OPERATIONAL EFFECTS ON AIR QUALITY

REGIONAL EMISSIONS

Changes in emissions that would result from the CHFP alternatives during operation in the 2035 analysis year were estimated as a range for alternatives that would have similar effects, accounting for emissions changes resulting from reduced truck VMT, as well as the emissions that would be generated by the increased use of diesel locomotives, ferries, and tug boats. The assessment methodology is summarized in the following sections.

Reduced Truck Travel

The emissions changes due to the regional reductions in commodity truck VMT were estimated using the projected VMT changes reported in Chapter 5, “Transportation.” Emission factors in grams per mile for criteria pollutant and MSAT emissions for combination short- and long-haul diesel trucks on restricted roadways (i.e., expressways, freeways, and interstates) were obtained using the MOVES model at the average vehicle speeds estimated in the transportation analysis.

Increased Rail Use

The emissions from diesel locomotives were calculated using rail fuel consumption based on ton-miles in year 2035 for each alternative, calculated with an energy consumption factor of 298 BTU/ton-mile[1] and a heat content of 138,700 BTU/gallon motor diesel, and USEPA’s estimates of typical in-use criteria pollutant emission rates for locomotives subject to the tier standards based on the date a locomotive is first manufactured. The expected fleet average emission factors in grams per gallon for criteria pollutants in 2035 were obtained from USEPA’s projected future emission factors, which include the fleet penetration of the various tiers of locomotives.[2] MSAT emissions were developed using the ratio of specific pollutant emissions to total VOC emissions from locomotives, reported in the National Scale Modeling of Air Toxics for the Mobile Source Air Toxics Rule, Technical Support Document[3] and the projected diesel locomotive VOC emissions for the CHFP alternatives. In the case of naphthalene, PM emissions

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[1] Oak Ridge National Laboratory and the U.S. Department of Energy, Transportation Energy Data Book, Table 9.8, Edition 30, 2011.

[2] Emission Factors for Locomotives, EPA-420-F-09-025, April, 2009.

[3] U.S. Environmental Protection Agency, National Scale Modeling of Air Toxics for the Mobile Source Air Toxics Rule, Technical Support Document, 2006.

rations and PM emissions for the alternatives were used, following the Technical Support Document methodology. The rail ton-miles used in the emissions analysis were developed for classes of similar alternatives.

Increased Ferry and Tug Use

The Port Authority of New York and New Jersey (PANYNJ) compiled fuel expenditure data for its existing railcar float operations, and conducted a detailed analysis of fuel consumption and criteria pollutant emissions from both the existing tug boats used to operate the railcar float system and potential technologies that would be implemented in the future. For the purposes of this analysis it was assumed that each tug boat and barge would be powered by two 700 horsepower (hp) diesel propulsion motors and two 220 kW electric motors (arranged in parallel). Annual emissions from tug boats were calculated based on an assumed railcar float capacity of 20 railcars, the projected 116 railcars per day crossing New York Harbor under the Enhanced Railcar Float Alternative, and operation on 295 days of the year. On average, the railcar float was assumed to be 75 percent full. Per-trip criteria pollutant emissions were based on PANYNJ projections that considered engine loads by tug boat task (i.e., startup, transit to railcar float, connecting to railcar float, maneuvering, railcar float transport, loading, unloading, etc.), and emission factors from the engine manufacturer. MSAT emissions for the railcar float tug boats were developed using the ratio of specific pollutant emissions to total VOC (or total PM) emissions for commercial marine vehicles, as reported in the MSAT Rule Technical Support Document3 and the projected railcar float tug boat VOC (or PM) emissions for the CHFP alternatives.

LOCAL EFFECTS ON AIR QUALITY

At the local level, freight facilities where greater levels of activity would be expected with the CHFP would result in an increase in pollutant emissions that may have an effect on surrounding uses. In addition, there would be an increase in truck volumes on roads used to access the facilities, as discussed in Chapter 5, potentially affecting local air quality. Emissions along the rail corridor used for CHFP would also increase, as would the concentrations of air pollutants near the rail tunnel portals and vents. Despite these local increases, which would be mitigated to the extent practicable, the Build Alternatives would result in regional benefits to air quality.

Information required to quantitatively analyze the effects of local increases in emissions is not available at this time, since this Tier I EIS will result in a corridor level decision on viable alternatives modes, alignments, and termini. Detailed engineering designs for proposed and existing freight facilities are not available. Therefore, the potential effects of local increases in emissions are discussed qualitatively, based on the expected increase in activity at the rail facilities, existing traffic on the access roads, and proximity to residential and other uses of concern. Emission sources that would have the potential to adversely affect local air quality, and locations where such effects may be of concern, are identified for future study in any Tier II documentation.

CONSTRUCTION EFFECTS ON AIR QUALITY

Improvement and expansion of freight facilities, improvements along rail corridors, and the construction of float bridges, the rail tunnel, the tunnel portals, and ventilation shafts would all result in the emission of air pollutants during construction. Depending on the duration and intensity of construction activity at a single location, there may be a potential for adverse local air quality effects on uses near the construction site. The pollutant emissions of greatest concern for construction are $PM_{2.5}$ and NO_2. Information required to conduct a detailed analysis of construction emissions and identify locations where levels above NAAQS would be expected is not available. Therefore, the construction activities of concern will be discussed along with a summary of the methodology for conducting a detailed analysis in any Tier II documentation. Potential measures that would minimize construction emissions are identified.

At the regional level, most construction activities, such as expansion and improvements at the freight facilities, would not result in emissions that would be of concern, especially since emissions from ordinary construction activity are included in the SIP. Therefore, an assessment methodology for determining the impacts of construction of the Waterborne Alternatives on regional air quality is not discussed here. It is unlikely that a regional analysis of emissions from the construction of Waterborne Alternatives would be warranted in any Tier II documentation. However, emissions associated with the construction of the tunnel for the Rail Tunnel Alternatives would be substantial, and coordination with the state and federal agencies may be required in any Tier II documentation, to ensure the inclusion of tunnel construction emissions in the SIP. The methodology for the Tier II assessment is discussed in Section E of this chapter.

C. EXISTING CONDITIONS

CRITERIA POLLUTANTS

Monitored background data were used to determine existing conditions. Monitored ambient pollutant concentrations of CO, SO_2, PM_{10}, $PM_{2.5}$, NO_2, lead, and ozone for the regional environmental analysis study area are shown in **Table 6.6-4**. These values are the most recent monitored data available for nearby monitoring stations. Monitored violations of the NAAQS for ozone were recorded at multiple monitoring locations in New York and New Jersey.

NON-CRITERIA POLLUTANTS

USEPA projected (using emissions data and dispersion modeling) benzene concentrations in the most populated areas of New Jersey in 2002 to be 10 to 50 times the benchmark (0.13 $\mu g/m^3$), while less populated areas were 5 to 10 times the benchmark. This projected data is supported by monitored concentrations from three monitoring stations. In general, according to NJDEP,[1] the health benchmarks for all seven MSATs of concern identified above are exceeded in most or all of New Jersey, with the highest concentrations in areas with higher population. New York State has not published an analysis of the HAP monitoring in its annual air quality report. However, the monitored concentrations at various stations throughout New York State reveal a range of concentrations generally similar to those observed in New Jersey.

[1] NJDEP, 2012 Air Quality Report—Air Toxics Summary, http://www.njaqinow.net

Table 6.6-4
Air Pollutant Concentrations in the Study Area

Ozone (ppm)		**8-Hour**
	NAAQS	*0.075*
Bronx, NY	Botanical Gardens / Pfizer Lab	0.076+
Richmond, NY	Susan Wagner	0.085+
New York, NY	CCNY	0.076+
Queens, NY	Queens College 2	0.081
Suffolk, NY	Babylon	0.086+
Westchester, NY	White Plains	0.077+
Putnam, NY	Mt. Ninham	0.071
Bergen, NJ	Ramapo	0.075
Hudson, NJ	Bayonne	0.078+
Hunterdon, NJ	Flemington	0.080+
Middlesex, NJ	Rutgers University	0.085+
Monmouth, NJ	Monmouth University	0.083+
Morris, NJ	Chester	0.078+
Ocean, NJ	Colliers Mills	0.085+

CO (ppm)		**1-Hour**	**8-Hour**
	NAAQS	*35*	*9*
Bronx, NY	Botanical Gardens	2.1	1.55
New York, NY	CCNY	2.2	1.3
Queens, NY	Queens College 2	1.7	1.1
Essex, NJ	East Orange	2.6	1.8
Hudson, NJ	Jersey City	3.2	2.5
Union, NJ	Elizabeth	3.1	1.8

Particulate Matter (μg/m^3)		**PM_{10} 24-Hour**	**$PM_{2.5}$ 24-hour**	**$PM_{2.5}$ Annual**
	NAAQS	*150*	*35*	*15*
New York, NY	Division Street	39	26	11.5
New York, NY	P.S. 19	NA	26	11.8
Bronx, NY	Morrisania	31	NA	NA
Bronx, NY	I.S. 74	NA	27	11
Kings, NY	J.H.S. 126	NA	24	10.0
Queens, NY	Queens College 2	32	24	9.1
Richmond, NY	Port Richmond	NA	24	9.7
Nassau, NY	Eisenhower Park	NA	28	9.8
Suffolk, NY	Babylon	NA	23	8.4
Westchester, NY	White Plains	NA	22	7.9
Bergen, NJ	Fort Lee Library	NA	19.2	9.2
Essex, NJ	Newark Firehouse	NA	21.5	NA
Hudson, NJ	Jersey City Firehouse	73	24.1	10.1
Hudson, NJ	Union City	NA	24.6	11.1
Middlesex, NJ	New Brunswick	NA	17.5	8.0
Morris, NJ	Morristown Amb Squad	NA	18.2	8.4
Ocean, NJ	Toms River	NA	20.9	8.5
Passaic, NJ	Paterson	NA	21.4	9.3
Union, NJ	Elizabeth Lab	NA	25.8	11.2
Union, NJ	Rahway	NA	23.0	9.7
Warren, NJ	Phillipsburg	NA	22.2	9.4

Table 6.6-4 (cont'd)
Air Pollutant Concentrations in the Study Area

SO_2 (ppm)		1-Hour	3-Hour
	NAAQS	*0.075*	*0.50*
Bronx, NY	Botanical Gardens / Pfizer Lab	0.040	0.026
Queens, NY	Queens College 2	0.025	0.016
Nassau, NY	Eisenhower Park	0.021	0.028
Putnam, NY	Mt. Ninham	0.009	0.006
Hudson, NJ	Jersey City	0.017	0.012
Morris, NJ	Chester	0.021	0.008
Union NJ	Elizabeth Lab	0.031	0.026
NO_2 (ppm)		**1-Hour**	**Annual**
	NAAQS	*0.100*	*0.053*
Bronx, NY	Botanical Gardens / Pfizer Lab	0.063	0.019
Queens, NY	Queens College 2	0.064	0.018
Middlesex, NJ	Rutgers University	0.045	0.009
Union, NJ	Elizabeth Lab	0.070	0.022
Hudson, NJ	Bayonne	0.062	0.015
Essex, NJ	East Orange	0.060	0.018
Morris, NJ	Chester	0.037	0.005
Lead (µg/m^3)		**3-month average**	
	NAAQS	*0.15*	
Brooklyn, NY	JHS 126	0.019	

+ indicates value exceeding NAAQS

Sources:

NYSDEC, *New York State Ambient Air Quality Data for 2012.*

NJDEP 2012 Air Quality Report, http://www.njaqinow.net.

Notes: Concentrations are presented in the statistical form defined in the NAAQS: Short-term average PM_{10}, CO, and 3-hour SO_2 concentrations are the second-highest of the year. SO_2 1-hour is the 3-year average of the annual 99th percentile daily maximum 1-hour average concentration. NO_2 1-hour is the 3-year average of the annual 98th percentile daily maximum 1-hour average concentration. The concentration for lead is based on 2009 New York State data. $PM_{2.5}$ annual concentrations are averaged over three years (2010-2012 for New York, and New Jersey). The 24-hour average concentration is the average of the annual 98th percentiles in 2010-2012 for New York State and New Jersey counties. 8-hour average ozone concentrations are the average of the 4th highest-daily values from 2010-2012 for New York and New Jersey counties.

USEPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades in three ways: (1) by lowering the benzene content in gasoline; (2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures; and (3) by reducing emissions that evaporate from, and permeate through, portable fuel containers. Federal regulations are also severely reducing the diesel emissions from both on-road and non-road vehicles, and diesel PM is therefore also expected to diminish over time.

D. PROBABLE EFFECTS OF THE PROJECT ALTERNATIVES

The probable regional and local effects of the Build Alternatives are qualitatively summarized in **Table 6.6-5**.

REGIONAL EFFECTS

As shown in **Table 6.6.-6**, the CHFP alternatives would result in air quality benefits in the regional environmental analysis study area and beyond. For some pollutant, it is possible that negligible increases in pollutant emission may occur. While rail and waterborne modes are more energy efficient at transporting freight, recent efforts to reduce truck emissions have been successful, and in the case of some pollutants, trucks emit less per ton mile of freight transported than locomotives and marine engines. The expected range of changes in annual criteria pollutant emissions in the region are reported for each class of the Build Alternatives as compared with the No Action Alternative, for the 2035 analysis year.

Net changes in criteria pollutant emissions with the CHFP alternatives are shown in **Table 6.6-6**. The Rail Tunnel Alternatives would reduce regional emissions of NO_x and particulate matter, and both PM_{10} and $PM_{2.5}$. However, all of the Build Alternatives could result in an emissions increase of VOC and CO, and the Waterborne Alternatives could result in a small increase of all criteria pollutants, mostly due to relatively high emissions from marine engines as compared to emissions from trucks. Options to reduce these emissions could be explored as part of any Tier II analysis.

The improvement in locomotive engines would substantially decrease the emissions of NO_x. It is important to note that the improvement in technology would also lead to a reduction in CO emissions, which is not reflected in the emission factors for CO used. USEPA acknowledges that the CO emission factors for locomotives for future years may be overestimated.

While some increases in pollutant burdens may result in the region, transportation conformity is determined considering the total emissions from all regional projects for each criteria pollutant. The increases predicted would be unlikely to affect the future transportation conformity determination or the SIP budgets.

Net changes in MSAT emissions of concern with the CHFP alternatives would be insubstantial at the regional scale. With the Waterborne Alternatives, a small regional emissions increase in all MSATs considered could result. For the Rail Tunnel Alternatives, small regional decreases for emissions of all MSATs except acrolein and naphthalene would be anticipated. There is little information on MSAT emissions from locomotives and marine engines, but emissions of some pollutants are expected to be higher than from highway vehicles due to a lack of pollution control features. The changes (both increases and decreases) in MSAT emissions would not be substantial.

Table 6.6-5
Qualitative Summary of the Effect of Build Alternatives on Air Quality

Effect on Air Quality	Waterborne Alternatives: Enhanced Railcar Float	Waterborne Alternatives: Truck Ferry	Waterborne Alternatives: Truck Float	Waterborne Alternatives: LOLO Container Barge	Waterborne Alternatives: RORO Container Barge	Rail Tunnel Alternatives: Rail Tunnel	Rail Tunnel Alternatives: Rail Tunnel with Shuttle Service	Rail Tunnel Alternatives: Rail Tunnel with Chunnel Service	Rail Tunnel Alternatives: Rail Tunnel with AGV* Technology	Rail Tunnel Alternatives: Rail Tunnel with Truck Access
Decrease Regional Truck VMT, Decrease Emissions	Somewhat	no / negligible	no / negligible	no / negligible	no / negligible	yes	yes	yes	yes	yes
Increase Local Truck VMT, Increase Local Emissions	Somewhat	yes	yes	yes	yes	somewhat	yes	yes	yes	yes
Reduce Idling on Existing Crossings, Reduce Regional Emissions	Somewhat	somewhat	somewhat	somewhat	somewhat	yes	yes	yes	yes	yes
Increase Rail Miles, Increase Regional Emissions	Somewhat	no / negligible	no / negligible	no / negligible	no / negligible	yes	yes	yes	yes	yes
Increase Local Emissions from Rail	Somewhat	no / negligible	no / negligible	no / negligible	no / negligible	yes	yes	yes	yes	yes
Increase Marine Vessel Emissions	Yes	yes	yes	yes	yes	no / negligible	no / negligible	no / negligible	no / negligible	no / negligible
Net Effect on Regional Air Quality	Depending on the emissions and efficiency of the tug boats that would be used for the railcar float, the overall emissions may increase with the project.	These alternatives would not have a large effect on truck VMT. The emissions reduced through reduced congestion on existing crossings would be imperceptible and much smaller than the increase in emissions due to emissions from the ferries or tug boats.				These alternatives would reduce emissions by reducing regional truck VMT and idling emissions due to congestion on existing crossings. These benefits will outweigh the increase in rail emissions.				
Net Effect on Local Air Quality	Increases in truck and rail emissions would have the potential to affect only areas that are in very close proximity to the rail corridor and proposed freight facilities.	These alternatives would have the potential to affect areas near roadways that would be used as access to the waterfront terminals and areas in close proximity to the activities that would occur near those terminals. Based on the projected number of trucks per day that would be diverted with these alternatives, it is unlikely that their effect on air quality would be significant.				The local effects of the Rail Tunnel Alternatives may be significant in close proximity to the rail corridor, tunnel portals, and freight facilities. There would be a more pronounced effect on air quality near the shuttle, chunnel, and AGV terminals. With chunnel and truck access, the potential local effects from additional truck traffic would likely be significant and available mitigation options would possibly be insufficient to fully mitigate the effects.				

Note: * AGV = Automated Guided Vehicle

Table 6.6-6
Estimated 2035 Net Change in Criteria Pollutant Emissions (Tons per Year)

Alternatives		NO_x	CO	VOC	PM_{10}	$PM_{2.5}$
Waterborne	Enhanced Railcar Float	Negligible to 12	Negligible to 5	Negligible to 0.3	Negligible to 0.2	Negligible to 0.2
	Truck Ferry					
	Truck Float					
	LOLO Container Barge					
	RORO Container Barge					
Rail Tunnel	Rail Tunnel	-30 to -53	19 to 30	-0.2 to 0.2	-1.1 to -1.5	-1.1 to -1.4
	Rail Tunnel with Shuttle Service					
	Rail Tunnel with Chunnel Service					
	Rail Tunnel with AGV Technology					
	Rail Tunnel with Truck Access					
Note: The change in emissions for Build Alternatives is as compared with the No Action Alternative. Negative values reflect reduced emissions (benefit), while positive values reflect an emissions increase.						

LOCAL EFFECTS

WATERBORNE ALTERNATIVES

Enhanced Railcar Float

Freight Facilities

A detailed analysis of emissions from equipment and activities at Maspeth Yard and Fresh Pond Yard, which would be used as part of the Enhanced Railcar Float Alternative was conducted for the 2004 *Cross Harbor Freight Movement Project Draft EIS* (“2004 DEIS”). Predicted increases in $PM_{2.5}$ concentrations were found to be above the CEQR $PM_{2.5}$ criteria. The 2004 DEIS predicted that substantial $PM_{2.5}$ emission reductions (of more than 80 percent) could potentially be achieved through various emission reduction measures, similar to those identified in the following section. With these measures in place, the increases in $PM_{2.5}$ concentrations and other pollutants would be within the allowable range. As discussed in this EIS, more than one facility would process CHFP freight. The termini and support facilities for the Enhanced Railcar Float Alternative are listed in Table 4-5 in Chapter 4, “Alternatives.” With the freight processing activities distributed between more yards, the potential effects of any single yard would be less than those predicted in the 2004 DEIS. While adverse effects near freight facilities would not be likely, a more detailed and updated analysis of emissions from the facilities that are very close to sensitive uses would be needed in any Tier II documentation. The activities in the yards would have the greatest potential effect on sensitive uses within 400 feet of the sites.

Chapter 5 included a preliminary identification of a number of intersections where a detailed traffic assessment would be required as part of Tier II, based on the projected peak hour truck trips associated with the freight terminals and supporting facilities. A detailed Tier II assessment of the effect of the truck emissions on air quality would be required at those same intersections. The assessment would require emissions modeling of heavy trucks, focusing on $PM_{2.5}$ and PM_{10}, and including fugitive dust where appropriate. The dispersion of the emissions would then need to be modeled using detailed traffic information, such as lane configuration, signal timing, and hourly meteorological data over a five-year period. Based on the proximity of the freight facilities to transit and the typical number of workers at similar freight facilities, it is unlikely that a quantified analysis of emissions from worker vehicle trips on air quality would be required.

Rail Lines

Based on a preliminary screening assessment of the potential air quality effects along the rail corridor, it was estimated that the Enhanced Railcar Float Alternative would not result in concentrations of concern beyond 200 feet of the tracks. Effects within 200 feet would require a detailed analysis as part of any Tier II documentation. The preliminary screening assessment was based on expected peak hour emissions, along a 1,000-foot segment of the Bay Ridge Branch. Then, conservatively assuming that the locomotive emissions would be generated continuously at a single point, the latest *City Environmental Quality Review (CEQR) Technical Manual* screening analysis for industrial sources was used to calculate concentrations within various distances from the source. At 200 feet from the tracks, with these worst-case emission projections, all pollutant concentrations would be less than the NAAQS and local New York City $PM_{2.5}$ criteria. With a more detailed analysis of specific alternatives and rail segments, it could likely be shown that even within less than 200 feet of the tracks the effect on air quality would not be of concern.

Marine Vessels

The emissions from marine vessels associated with the Enhanced Railcar Float Alternative were considered at the regional level, but would not be of major concern locally. Most of the emissions would take place on route between Greenville Yard and the 65th Street Yard and 51st Street Yard on the Brooklyn waterfront and the Oak Point Yard on the Bronx waterfront. Prolonged exposure on route would not be expected and is therefore not of concern. Idling and other emissions near the terminals for the Enhanced Railcar Float Alternatives could be reduced through best practices and possible electrification. These emissions would be too far from residential and other non-industrial uses to result in potential adverse effects on air quality. Options to reduce emissions from marine vessels at the local level would be explored in any Tier II documentation.

Truck Float Alternative

Freight Facilities

Like the Enhanced Railcar Float Alternative, the Truck Float Alternative would not be likely to result in significant adverse effects near freight facilities/termini shown for this alternative in Table 4-5 in Chapter 4, if emission reduction measures are implemented. However, a detailed analysis of emissions from the facilities that are very close to sensitive uses would be needed in any Tier II documentation. The activities in the yards would have the greatest potential effect on sensitive uses within 400 feet of the sites. As described for the Enhanced Railcar Float Alternative, the intersections that were identified in Chapter 5, "Transportation," for further study with the facilities that would serve as terminals for the Truck Float Alternative would be further studied in Tier II documentation to assess the potential for significant adverse impacts on air quality from the trucks.

Marine Vessels

The emissions from marine vessels associated with the Truck Float Alternative were considered at the regional level, but would not be of major concern locally, as most of the emissions would take place on route between terminals where prolonged exposure would not be expected. Idling and other emissions near the terminals for the Truck Float Alternative could be reduced through best practices and possible electrification. These emissions would be too far from residential and other non-industrial uses to result in potential adverse effects on air quality. As discussed for the Enhanced Railcar Float Alternative, options to reduce emissions from marine vessels at the local level would be explored in any Tier II documentation.

Truck Ferry Alternative

The anticipated effects on air quality of the Truck Ferry Alternative would be identical to those described under the Truck Float Alternative.

Lift On-Lift Off (LOLO) Container Barge Alternative

Freight Facilities

Like the Enhanced Railcar Float Alternative, the LOLO Container Barge Alternative would not be likely to result in significant adverse effects near freight facilities/termini shown for this alternative in Table 4-5 in Chapter 4," if emission reduction measures are implemented. A detailed analysis of emissions from the facilities that are very close to sensitive uses would be needed in any Tier II documentation. As described for the Enhanced Railcar Float Alternative, the intersections that were identified in Chapter 5 for further study with the facilities that would serve as terminals for the LOLO Container Barge Alternative would be further studied in Tier II documentation to assess the potential for significant adverse impacts on air quality from the trucks that would distribute goods to and from the container terminals.

Marine Vessels

The emissions from the container barge tugs were considered at the regional level, but would not be of major concern locally, as most of the emissions would take place on route between terminals where prolonged exposure would not be expected. Idling and other emissions near the terminals for the LOLO Container Barge Alternative could be reduced through best practices and possible electrification. These emissions would be too far from residential and other non-industrial uses to result in potential adverse effects on air quality. As discussed for the Enhanced Railcar Float Alternative, options to reduce emissions from marine vessels at the local level would be explored in any Tier II documentation.

Roll On-Roll Off (RORO) Container Barge Alternative

The RORO Container Barge Alternative on air quality and need for further study would be the same as described under the LOLO Container Barge Alternative, with one exceptions. A lift-on lift-off crane would not be needed for the RORO Container Barge, as the containers would roll on and off the barge. The RORO Container Barge Alternative emissions would be somewhat lower than emissions from the LOLO Container Barge Alternative, as the emissions from the crane would not occur.

RAIL TUNNEL ALTERNATIVES

Rail Tunnel Alternative

Freight Facilities

Like the Waterborne Alternatives, the Rail Tunnel Alternative would not be likely to result in significant adverse effects near freight facilities/termini shown for this alternative in Table 4-5 in Chapter 4, "Alternatives," if emission reduction measures are implemented. A detailed analysis of emissions from the facilities that are very close to sensitive uses would be needed in any Tier II documentation. The intersections that were identified in Chapter 5, "Transportation," for further study with the terminals and supporting facilities for the Rail Tunnel Alternative would be further studied in Tier II documentation to assess the potential for significant adverse impacts on air quality from the trucks that would distribute goods to and from the facilities.

Rail Lines

Like the Enhanced Railcar Float Alternative, the Rail Tunnel Alternative would be unlikely to result in significant adverse impacts on air quality beyond 200 feet of the tracks, based on a preliminary screening assessment and the assumption that emission reduction measures would be implemented. Effects within 200 feet would require a detailed analysis as part of any Tier II documentation.

Tunnel Ventilation System and Tunnel Portals

The potential effects of the tunnel ventilation systems and diesel locomotive emissions at the tunnel portals on air quality were evaluated in the 2004 DEIS for a similar tunnel and demand similar to that projected for the Rail Tunnel Alternative under the Seamless Operating Scenario. No potential for adverse effects from the tunnel ventilation systems was found. While a tunnel ventilation design for the Rail Tunnel Alternatives has not been developed for this Tier I EIS, based on the likely height of the vents and the potential locations of the vents in areas where existing building heights are much lower, the potential for adverse effects is unlikely. In the 2004 DEIS, the potential for effects on air quality at the tunnel portals was identified. A detailed analysis would be required for any Tier II documentation to assess potential impacts, develop mitigation measures, and optimize the ventilation system design.

Rail Tunnel with Shuttle ("Open Technology') Service Alternative

The effects of the Rail Tunnel with Shuttle Service Alternative on air quality would be greater than the effects of the Rail Tunnel Alternative along the portion of the rail corridor where the shuttle service would operate. However, it is unlikely that significant impacts would occur beyond 200 feet of the tracks if mitigation measures are implemented. There would also be additional emissions from loading and unloading at the shuttle service terminals listed in Table 4-5 in Chapter 4, "Alternatives." The potential impacts at the terminals may be significant and would need to be studied in greater detail in any Tier II documentation. In addition, the ventilation requirements for the Rail Tunnel with Shuttle Service Alternative would be greater than assumed for the ventilation systems studied in 2004. Based on the likely height of the vents and the potential locations of the vents in areas where existing building heights are much lower, the potential for adverse effects is unlikely. A more detailed analysis would be needed in Tier II to determine the feasibility of design and potential for impact.

Rail Tunnel with Chunnel Service Alternative

The effects of the Rail Tunnel with Chunnel Service Alternative on air quality and need for further study in any Tier II documentation would be similar to those described for the Rail Tunnel with Shuttle Service Alternative, but would affect the terminals for chunnel service, listed in Table 4-5 in Chapter 4.

Rail Tunnel with Automated Guided Vehicle (AGV) Technology Alternative

The effects of the Rail Tunnel with AGV Technology Alternative on air quality and need for further study in any Tier II documentation would be similar to those described for the Rail Tunnel Alternative, but would affect the terminals for this alternative, listed in Table 4-5 in Chapter 4. The AGVs would run on electricity and would therefore not result in local effects on air quality.

Rail Tunnel with Truck Access Alternative

The potential for significant adverse impact on air quality with the Rail Tunnel with Truck Access Alternative would be very high near the terminals for this alternative, listed in Table 4-5 in Chapter 4. As discussed in Chapter 5, Linden Boulevard in East New York, near the eastern terminus of the Rail Tunnel with Truck Access Alternative, could see an increase of more than 5,200 trucks per day. As many as 3,000 additional trucks per day could use the Newark Bay Extension of the New Jersey Turnpike and Routes 1 and 9 in northern New Jersey to access the western terminus of the Rail Tunnel with Truck Access Alternative. Mitigating the adverse air quality from this many trucks that would likely result and potentially affect environmental justice communities would be extremely challenging. Furthermore, the ventilation requirements for the Rail Tunnel with Truck Access Alternative would be greater than assumed for the ventilation systems studied in 2004. While the differences in ventilation system heights and nearby building heights would be unlikely even with truck access, a more detailed analysis would be needed in Tier II to determine the potential for impact, should the Rail Tunnel with Truck Access Alternative be selected for implementation.

E. CONSTRUCTION

At this time, the types and sizes of equipment that would be used for construction, the projected usage factors, and the detailed construction activity schedules are not available. In any Tier II documentation, an analysis of the potential effects of construction emissions on air quality would be needed for any of the sites where prolonged construction activity would take place. USEPA's NONROAD emission model could be used to calculate emissions from construction equipment. The focus would be on particulate matter emissions. Fugitive emissions would be accounted for, including emission generated by material handling activities, truck transport, material piles, and concrete batching. Estimates of emissions from these activities would be developed based on USEPA procedures delineated in AP-42. Pollutant dispersion would be analyzed using the USEPA AERMOD model.

Regional emissions from any potentially intensive construction activities would need to be budgeted for in the SIP, and coordination with the MPOs and state environmental agencies would be required. In addition, if emissions from any dredging activity would occur, coordination with the U.S. Army Corps of Engineers would be required.

Construction at the freight facilities and along the rail corridor is not expected to be intensive or last for a long time. The longest portion of the tunnel construction would occur in the harbor and under water. The most intensive and long-lasting construction activity on land would be the construction of the tunnel portals. By implementing the construction emission reduction measures discussed in the following section, emissions would be minimized and any potentially high concentrations at sensitive uses near the construction sites would likely be infrequent. Further analysis in Tier II would be required to determine the potential magnitude, extent and frequency of high pollutant concentration events.

F. TIER II ANALYSIS AND POTENTIAL MITIGATION MEASURES

OPERATION

The emission and potential adverse air quality impact of the proposed project could be reduced both at the regional and local levels by using only newer locomotives that meet Tier 4 requirements. The use of Tier 4 locomotives exclusively would dramatically reduce NO_x, VOC, and PM emissions, resulting in greater regional benefits and lesser local impacts from the alternatives that would rely on rail (i.e., the Rail Tunnel Alternatives and the Enhanced Railcar Float Alternative). Emissions of MSATs would also be further reduced. Tier 4 (final) standards will become effective in 2015. The switcher locomotives being procured for short-term improvements at Greenville Yard (described under the No Action Alternative in Chapter 4, “Alternatives”) are compliant with Tier 4i (interim Tier 4) USEPA requirements, based on specifications provided by the manufacturer. These locomotives will reduce emissions of NO_x by 85 percent when compared with the fleet currently in use by New York New Jersey Rail (NYNJR) and will also reduce emissions of other pollutants. If similar low-emission engines were to be implemented for marine vessels that would be used for the Waterborne Alternatives, the air quality benefits of those alternatives would also increase.

Truck routes would be designated to the extent practicable to avoid residential areas. No-idling laws would be enforced. A detailed analysis of emissions from yard operations would be conducted in any Tier II documentation. Options for further reducing marine vessel emissions, such as using clean fuel, efficient or hybrid engines, optimizing routes, and limiting engine use when the vessels reach shore, would be explored. For the Rail Tunnel Alternatives that would accommodate trucks, measures to reduce local increases in truck emissions could be explored. For example the use of the chunnel service could be limited to trucks meeting certain emission standards. Alternatively, the use of cleaner trucks through the tunnel (with chunnel service or truck access) could be incentivized using pricing methods.

Several other measures would be included in the proposed project to substantially lower the potential for adverse impacts on air quality. The diesel switchers in the rail yards would be ultra-low emitting locomotives. The best available technology that meets the necessary performance will be implemented. Furthermore, all non-road diesel-powered equipment, such as cranes, hostlers, and forklifts, would utilize ultra- low sulfur diesel (ULSD) to control the emissions of particulate matter. The freight facilities would not use anti-skid abrasives and would institute dust control plans to minimize potential PM_{10} emissions from the project site.

CONSTRUCTION

Emissions from on-site construction equipment and on-road construction-related vehicles, and the effect of construction vehicles on background traffic congestion, have the potential to affect air quality. In the future, when design and construction plan information becomes available, potential effects of construction on air quality would be analyzed in more detail as part of any Tier II documentation. The analysis would include both on-site and on-road sources of air emissions, and the overall combined impact of both sources, where applicable. The analysis would also addresses both local concentrations and, where warranted, regional emissions. The focus would be on estimating and reducing particulate matter and NO_x emissions, as these pollutants have the greater potential to result in adverse effects on air quality during construction. Diesel engines that would be used for construction are not a major source of CO, and since ULSD would be used exclusively for all diesel engines throughout the construction sites, including marine engines, sulfur oxides emitted from construction activities would be negligible. Maximizing the use of rail and marine modes for transporting construction materials and debris would reduce local pollutant emissions. At the freight facilities, the use of electricity for equipment would be encouraged. To further reduce PM and/or NO_x emissions, the following emission reduction measures would be implemented to the maximum extent practicable through construction contracts:

- *Clean Fuel.* All diesel fuel used for the proposed project would contain 15 parts per million (ppm) or less sulfur by weight. This includes diesel fuel used for delivery trucks, non-road equipment, and tug boats.

- *Best Available Tailpipe Reduction Technologies.* Nonroad diesel engines with a power rating of 50 hp or greater and controlled truck fleets (i.e., truck fleets under long-term contract), including but not limited to concrete mixing and pumping trucks, would utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest PM reduction capability. Construction contracts would specify that all diesel non-road engines rated at 50 hp or greater would utilize DPFs, either installed on the engine by the original equipment manufacturer (OEM) or retrofit with a DPF verified by USEPA or the California Air Resources Board, and may include active DPFs, if necessary; or other technology proven to reduce DPM by at least 90 percent.
- *Use of Newer Equipment.* USEPA's Tier 1 through 4 standards for non-road equipment engines and locomotives regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons. All non-road construction equipment used for the proposed project would meet at least the Tier 3 emissions standard.
- *Tug Boat Emissions Reduction.* Emissions from any tug boats that may be used for construction would be minimized by installing retrofits, using new engines, repowering or engine replacement, or various combinations of these measures.
- *Idling Restrictions.* All efforts would be made to address heavy duty vehicle idling at the construction sites to reduce fuel usage (and associated costs) and emissions. On-road diesel fueled trucks are subject to idling laws. These vehicles may not idle for more than 5 consecutive minutes in New York State or for more than 3 minutes in New Jersey, except under certain specific conditions. In addition to enforcing the on-road idling laws, all reasonable efforts would be made to reduce idling of non-road diesel-powered equipment. ✷