PSD Air Quality Analysis

An applicant for a PSD permit is required to conduct an air quality analysis of the ambient impacts associated with the construction and operation of the proposed new source or modification. The main purpose of the air quality analysis is to demonstrate that the new emissions emitted from a proposed major stationary source or major modification, in conjunction with other applicable emissions from existing sources, will not cause or contribute to a violation of any applicable National Ambient Air Quality Standards (NAAQS) or PSD Increment.

A separate air quality analysis must be submitted for each regulated pollutant if the applicant proposes to emit the pollutant in a significant amount from a new major stationary source, or proposes to cause a significant net emissions increase from a major modification. Additional impact analyses are required for determining any impairment to visibility, soils, and vegetation that might result from the project.

The NAAQS are maximum concentration measured in terms of the total concentration of a pollutant in the atmosphere. Compliance with any NAAQS is based upon the total estimated air quality, which is the sum of the ambient estimates resulting from existing sources of air pollution and the modeled ambient impact caused by the applicant's proposed emissions increase. (See Table 1)

The PSD increment is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant. The baseline concentration is defined for each pollutant and is the ambient concentration existing at the time that the first complete PSD permit application affecting the area is submitted. Significant deterioration is said to occur when the amount of new pollution would exceed the applicable PSD increment. (See Table 2)

The amount of PSD increment that has been consumed in a PSD area is determined from the emissions increases and decreases which have occurred from sources since the applicable baseline date. Emission increases that consume a portion of the applicable increment are all those not accounted for in the baseline concentration and specifically include actual emissions increases occurring after the major source baseline date, which are at a major stationary source; and actual emission increases at any stationary source, area source, or mobile source occurring after the minor source baseline date. All major sources that have had significant permitted increases in the applicable pollutant since the major source baseline date within 50 km of the impact area must be considered. All nearby minor sources that have had permitted increases of the applicable pollutant since the minor source baseline date and that may have an effect on air quality in the impact area must also be considered. (See Table 3)

The area in which the minor source baseline date is established by a PSD permit application is known as the Baseline Area. The baseline area is limited to all intrastate areas. The baseline area established is to include all portions of the attainment or unclassified area in which the applicant has proposed to locate and any attainment or unclassified area surrounding it where it would have a significant ambient impact. (See Table 4)

Table 1 National Ambient Air Quality Standards (NAAQS)

Pollutant/Averaging Time	**Primary Standard**	**Secondary Standard**
Particulate Matter		
TSP, annual (pre 1987)	75 μg/m^3	Same as Primary Standard
TSP, 24-hour (pre 1987)	260 μg/m^3	Same as Primary Standard
PM_{10}, annual (post 1987)	50 μg/m^3	Same as Primary Standard
PM_{10}, 24-hour (post 1987)	150 μg/m^3	Same as Primary Standard
$PM_{2.5}$, annual (post 2006)	15 μg/m^3	Same as Primary Standard
$PM_{2.5}$, 24-hour (post 2006)	35 μg/m^3	Same as Primary Standard
Sulfur Dioxide		
SO_2, annual	0.03 ppm (80 μg/m^3)	Same as Primary Standard
SO_2, 24-hour	0.14 ppm (365 μg/m^3)	Same as Primary Standard
SO_2, 3-hour		0.5 ppm (1,300 μg/m^3)
SO_2, 1-hour (post 2010)	75 ppb	None
Nitrogen Dioxide		
NO_2, annual	0.053 ppm (100 μg/m^3)	Same as Primary Standard
NO_2, 1-hour (post 2010)	100 ppb	None
Ozone		
O_3, 8-hour (post 2008)	0.075 ppm	Same as Primary Standard
O_3, 8-hour (post 1997)	0.08 ppm	Same as Primary Standard
O_3, 1-hour	0.12 ppm (235 μg/m^3)	Same as Primary Standard
Carbon Monoxide		
CO, 8-hour	9 ppm (10 mg/m^3)	None
CO, 1-hour	35 ppm (40 mg/m^3)	None
Lead		
Pb, 3-month rolling average (post 2008)	0.15 μg/m^3	Same as Primary Standard
Pb, calendar quarter average	1.5 μg/m^3	Same as Primary Standard

Table 2 PSD Increment

Pollutant/Averaging Time	**Class I Area**	**Class II Area**
Particulate Matter		
TSP, annual (pre 1993)	5 μg/m^3	19 μg/m^3
TSP, 24-hour (pre 1993)	10 μg/m^3	37 μg/m^3
PM_{10}, annual (post 1993)	4 μg/m^3	17 μg/m^3
PM_{10}, 24-hour (post 1993)	8 μg/m^3	30 μg/m^3
$PM_{2.5}$, annual (post 2011)	1 μg/m^3	4 μg/m^3
$PM_{2.5}$, 24-hour (post 2011)	2 μg/m^3	9 μg/m^3
Sulfur Dioxide		
SO_2, annual	2 μg/m^3	20 μg/m^3
SO_2, 24-hour	5 μg/m^3	91 μg/m^3
SO_2, 3-hour	25 μg/m^3	512 μg/m^3
Nitrogen Dioxide		

NO_2, 3-hour	2.5 µg/m^3	25 µg/m^3

Table 3 Baseline Dates

Pollutant	**Major Source Baseline**	**Trigger Date**	**Minor Source Baseline Date**
PM	January 6, 1975	August 7, 1977	February 8, 1990
$PM_{2.5}$	October 14, 2010	October 14, 2011	Not Triggered Yet
SO_2	January 6, 1975	August 7, 1977	February 8, 1990
NO_2	February 8, 1988	February 8, 1988	February 8, 1990

Table 4 Significant Levels for Air Quality Impacts

Pollutant	**Annual**	**24 Hour**	**3 hour**
PM_{10}	1.0 µg/m^3	5 µg/m^3	-
$PM_{2.5}$ Class I	0.06 µg/m^3	0.07 µg/m^3	1.0 µg/m^3
$PM_{2.5}$ Class II	0.3 µg/m^3	1.2 µg/m^3	-
SO_2	1.0 µg/m^3	5 µg/m^3	25 µg/m^3
NO_2	1.0 µg/m^3	-	-

Table 5 Significant Monitoring Concentrations

Pollutant	**Air Quality Concentration (ug/m^3) and Averaging Time**
Carbon Monoxide	575 (8 hour)
Nitrogen Dioxide	14 (Annual)
Sulfur Dioxide	13 (24 hour)
Particulate Matter (TSP)	10 (24 hour)
Particulate Matter (PM_{10})	10 (24 hour)
Particulate Matter ($PM_{2.5}$)	4 (24 hour)
Ozone	
Lead	0.1 (3 month)
Asbestos	
Beryllium	0.001 (24 hour)
Mercury	0.25 (24 hour)
Vinyl Chloride	15 (24 hour)
Fluorides	0.25 (24 hour)
Sulfuric Acid Mist	
Total Reduced Sulfur	
Reduced Sulfur	
Hydrogen Sulfide	0.2 (1 hour)

Applications Evaluated for PSD Increment Consumption

Company Name	Plant ID	Permit Number(s)	Effective Date	Pollutant	Averaging Period	PSD Increment	Increment Consumed
American Synthetic Rubber Co	11	110-90-C, 111-90-C, 188-90-C, 193-90-C, 194-90-C, 195-90-C, 196-90-C, 197-90-C, 198-90-C, 199-90-C, 200-90-C	8/27/90	PM	24 Hour	37 µg/m^3	3.7 µg/m^3(Note 1)
				PM_{10}	24 Hour	30 µg/m^3	3.7 µg/m^3(Note 1)
				SO_2	3 Hour	512 µg/m^3	155 µg/m^3
					24 Hour	91 µg/m^3	54.1 µg/m^3
					Annual	20 µg/m^3	8.7 µg/m^3
				NO_x	3 Hour	25 µg/m^3	10.6 µg/m^3

Notes:

[1] The modeled impact is 3.7 µg/m^3 for both TSP (PM) and PM_{10}, which are less than the significant monitoring levels of 10 µg/m^3 from Table 5.

American Synthetic Rubber Co Boiler Project

An air quality impact analysis was required for the emissions of TSP, PM_{10}, SO_2, and NO_x from the proposed steam plant. The PSD determination is based on the following findings:

BACT will be applied to each emission unit that will emit any amount of a significant pollutant.

No allowable PSD increments or NAAQS will be violated as a result of emissions from this project

Air emissions resulting from this project will not impact any PSD Class I areas

Projected emissions will neither cause adverse impacts to soils and vegetation nor cause degradation of visibility.