

Increment Standards

In 1977, the Clean Air Act (CAA) was amended by Congress to include specific provisions aimed at preventing significant deterioration (PSD) of air quality in areas meeting the National Ambient Air Quality Standards (NAAQS). The goal of the PSD program was to fulfill three basic requirements:

- (1) Ensure that economic growth could continue without compromising air quality in “clean” regions,
- (2) Preserve human health and welfare, and
- (3) Protect, preserve and enhance the air quality in regions deemed pristine or as having special regional or national value.

Within the framework of the PSD program, each state identified land use goals based upon a three tiered classification system. The three tiered classification system allows for areas to be classified as Class I, Class II, or Class III. The classification of each area within the state determines the amount of pollution that can be introduced before the air quality is significantly deteriorated.

Class I areas are afforded the most protection under the PSD program and little air quality deterioration is allowed in these regions. Congress identified mandatory Class I regions throughout the United States based upon national/regional value due to natural, scenic, recreational, and/or historic worth. Figure 1, attached, displays the three, Class I areas that can trigger a review for Missouri applicants, Hercules Glades Wilderness Area and the Mingo Wildlife Refuge that are located within the State of Missouri and the Upper Buffalo Wilderness Area located in the State of Arkansas.

The remainder of the State of Missouri has been designated as a Class II area that is allowed moderate air quality deterioration. Class II areas are often associated with managed economic growth that allows for increased air quality impacts due to the construction of manufacturing facilities.

The third classification, Class III, is reserved for highly industrialized areas that are likely to experience a large amount of development. There are no Class III areas within the State of Missouri.

For each classification under the PSD program, fixed maximum allowable increases in pollution concentrations, increments, are allowed to occur for total suspended particulate (TSP), sulfur dioxide, (SO₂), particulate matter less than ten microns (PM₁₀), particulate matter less than two and one half microns (PM_{2.5}) and oxides of nitrogen (NO_x). Table 1, entitled “Prevention of Significant Deterioration Increments,” summarizes the current allowable PSD increments.



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| Table 1 | | | | |
|---|-------------------------|--|--|--|
| Prevention of Significant Deterioration Increments | | | | |
| Pollutant | Averaging Period | Class I Area Concentration | Class II Area Concentration | Class III Area Concentration |
| | | <i>($\mu\text{g}/\text{m}^3$)</i> | <i>($\mu\text{g}/\text{m}^3$)</i> | <i>($\mu\text{g}/\text{m}^3$)</i> |
| TSP | Annual | 5 | 19 | 37 |
| TSP | 24-Hour | 10 | 37 | 75 |
| SO ₂ | Annual | 2 | 20 | 40 |
| SO ₂ | 24-Hour | 5 | 91 | 182 |
| SO ₂ | 3-Hour | 25 | 512 | 700 |
| PM ₁₀ | Annual | 4 | 17 | 34 |
| PM ₁₀ | 24-Hour | 8 | 30 | 60 |
| PM _{2.5} | Annual | 1 | 4 | 8 |
| PM _{2.5} | 24-Hour | 2 | 9 | 18 |
| NO _x | Annual | 2.5 | 25 | 50 |

The PSD increment standards are the maximum ambient concentration increases that can occur above the existing baseline concentrations for a given area on a pollutant by pollutant basis. The baseline concentration is defined as the amount of pollution that exists at the time the first complete PSD permit application is submitted. When the amount of “new” pollution exceeds the increment standards, significant deterioration has occurred. In order to determine increment consumption; states are required to determine the date on which the first complete PSD application was received and the impact the application had on the air quality within the region. Within this framework, three differing implementation dates are defined: the major source baseline date, the trigger date and the minor source baseline date.

The major source baseline date is a fixed date that was established by Congress as the date from which increment consumption should be tracked after a major stationary source has submitted a PSD permit application. The major source baseline date was established in January of 1975 for SO₂ and TSP, February of 1988 for NO_x, June 1994 for PM₁₀ and October 2010 for PM_{2.5}. The trigger date, on the other hand, refers to the date that the major source baseline date became effective. For example, the major source baseline date for SO₂ and TSP was established in January of 1975; however, it did not become effective until August of 1977, i.e. the trigger date. The trigger date for NO_x and PM₁₀ are identical to the major source baseline dates established in February of 1988 and June 1994, respectively. Lastly, the trigger date for PM_{2.5} became effective one year after the major source baseline date (October 2010) in October 2011.

The Environmental Protection Agency implemented an “Equivalent Substitution” approach in order to replace the TSP increment standards with new PM₁₀ standards that became effective in June 1994. The TSP major source baseline date of January 1975 was maintained for PM₁₀. The replacement of the TSP standards was made official in Section 166(f) of the 1990 Clean Air Act Amendments.

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The final implementation date, the minor source baseline date, is the date that the first complete PSD permit application is received by the permit granting authority after the trigger date becomes effective. Only those pollutants that exceed their respective *de minimis* emission levels, refer to Table 2, trigger the minor source baseline date. For example, a facility submits a PSD permit application with NO_x emissions of 39.95 tons per year, SO₂ emissions of 40.2 tons per year and PM₁₀ emissions of 25 tons per year. The only pollutants that will trigger an increment area are PM₁₀ and SO₂ because they are the only pollutants that are going to exceed the *de minimis* emissions thresholds.

| Table 2 De Minimis Emission Levels | |
|---|--------------------------------------|
| Pollutant | Emission Rate (Tons/Year) |
| NO _x | 40 |
| TSP | 25 |
| PM ₁₀ | 15 |
| PM _{2.5} | 10 |
| SO ₂ | 40 |

Again, the minor source baseline date is pollutant specific and may differ from pollutant to pollutant. Some areas within the state may not have triggered the minor source baseline date and therefore, increment tracking for that pollutant within those regions is unnecessary.

The area in which the minor source baseline date is established is known as the baseline area. The furthest extent of the baseline area is limited to intrastate areas classified as attainment or unclassifiable within Section 107 of the CAA. These pre-defined areas are commonly known as Air Quality Control Regions. As defined in Section 107 of the CAA, the Air Quality Control Regions for the State of Missouri are multi-county regions for NO_x, PM₁₀/TSP and SO₂. Figure's 2, 3 and 4, attached, visually depict each of the Air Quality Control Regions as described in Section 107 for NO_x, PM₁₀/TSP and SO₂ along with their respective minor source baseline dates. Although the minor source baseline date has not been triggered for PM_{2.5}, the Air Quality Control Regions have been defined and are limited in extent to individual county boundaries.

The baseline dates and Air Quality Control Regions are important because they determine which emission sources should be included in the compliance determination for the individual increment standards. The amount of PSD increment that is consumed is based upon all emissions increases and decreases since the establishment of the minor baseline date and changes in emissions from major sources since the establishment of the major source baseline date. Generally, emission increases that consume increment should reflect those emissions that were not accounted for in the baseline concentrations and include the following:

- actual emissions increases that occur after the major source baseline date due to changes at major stationary sources, and
- all actual emissions increases from sources that occur after the receipt of a complete PSD permit application in which a pollutant listed in Table 2 exceeds its respective *de minimis* emission level.



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Credit for emission decreases are also allowed and can occur in two ways:

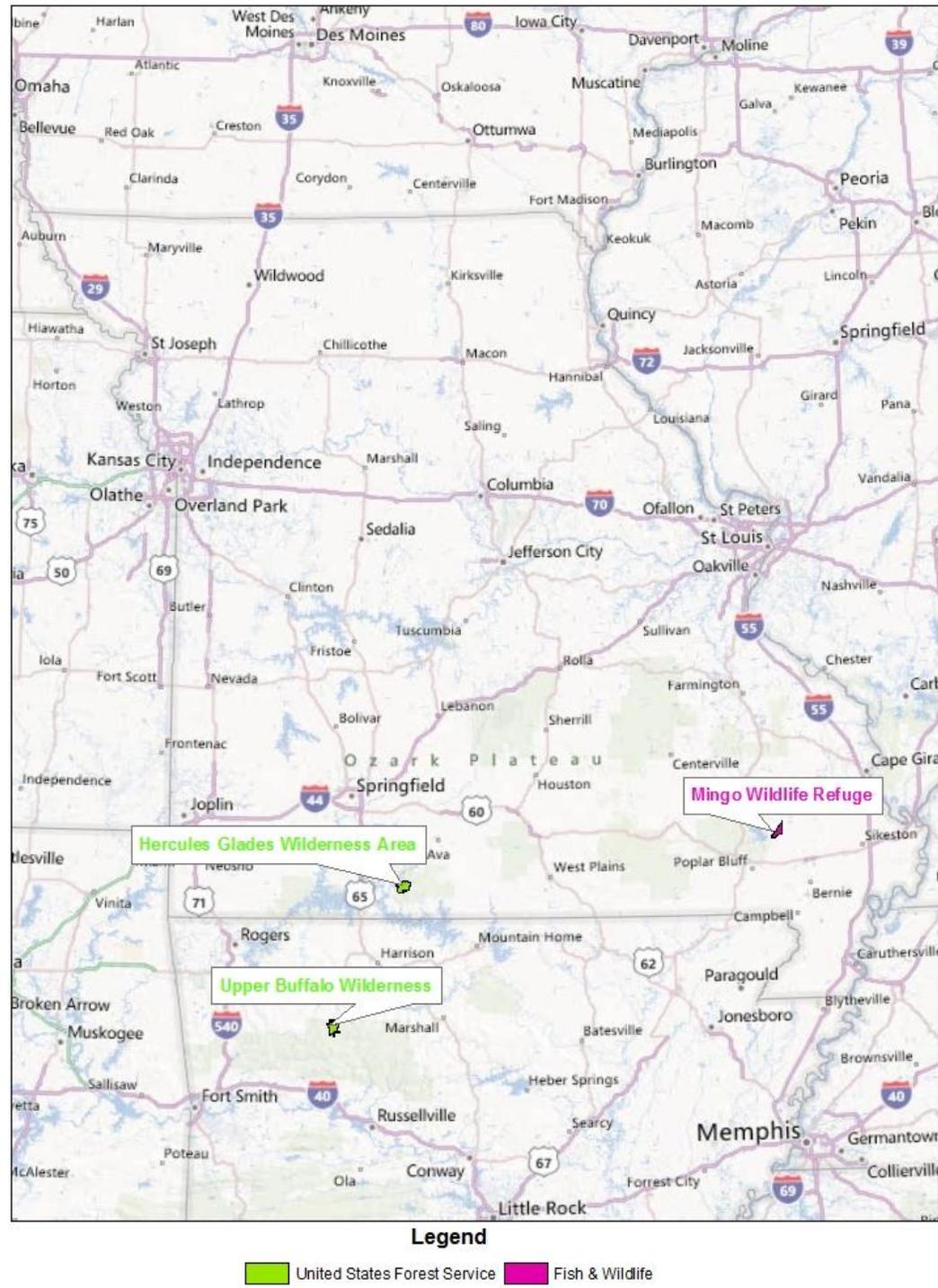
- actual emissions reductions that occur after the minor source baseline date, where the expansion is reflected in the air quality only in the fact that the overall ambient impact is reduced, and
- actual emissions reductions that occur to sources included in the baseline concentration that are federally enforceable through permit conditions or provisions within the State Implementation Plan.

Compliance with the increment standards is not limited to PSD permits. If the permit granting authority determines that a modeling study is necessary prior to the issuance of a construction permit, the applicant will be required to submit an increment compliance demonstration for each applicable pollutant and averaging time for which a significant ambient impact will take place.

As noted previously, increment compliance demonstrations are pollutant specific reviews whose requirements can differ based upon the averaging time being modeled. For guidance on modeling specific air pollutants it is necessary to determine the quantity of the pollutant being emitted and the permit type. The modeling requirements, including a pollutant specific overview of the increment compliance demonstration, are outlined at each of the following locations based upon permit type: *De Minimis* Permit Reviews, Minor Source Permit Reviews, or Major Source Permit Reviews.

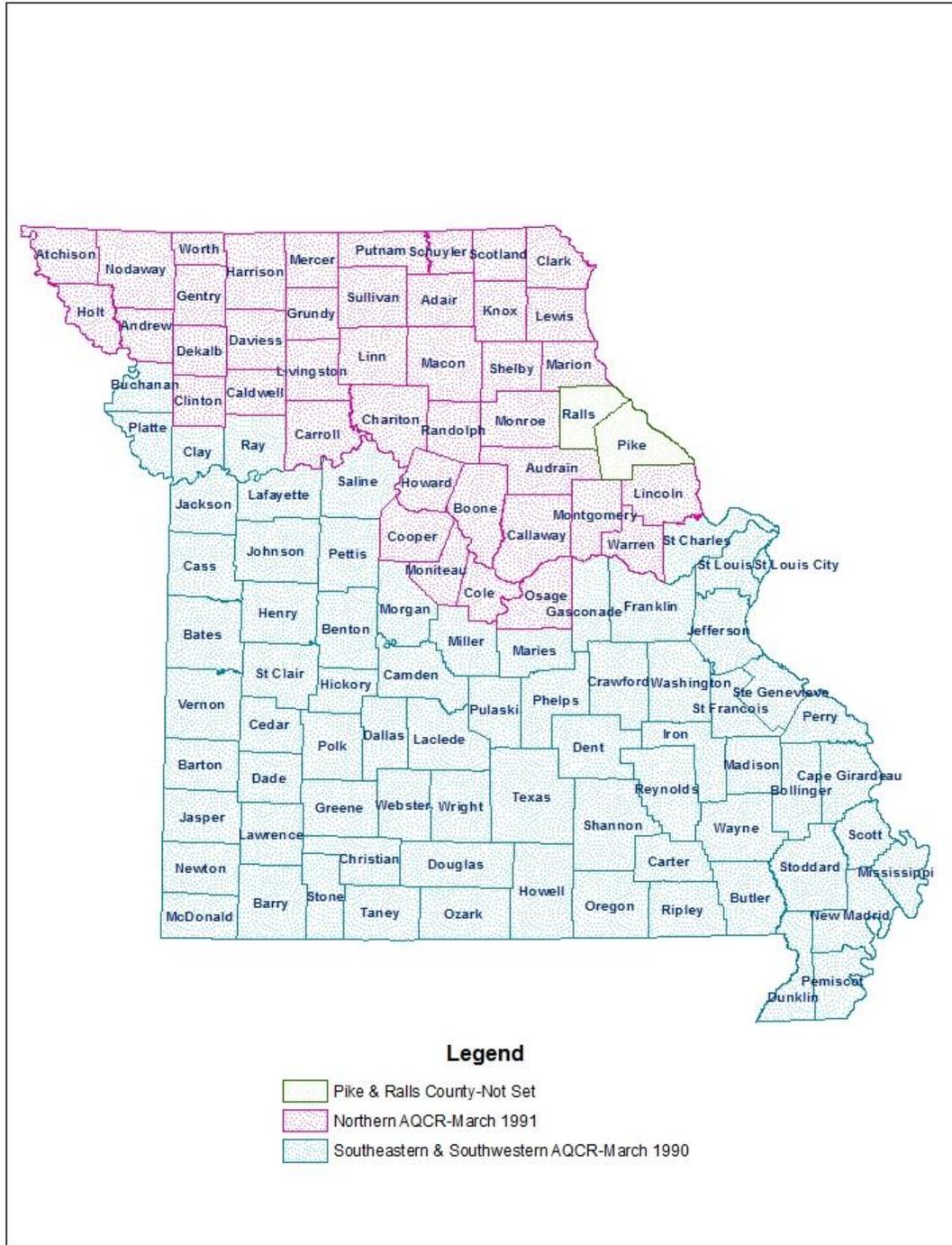
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**Figure 1
Class I Area Locations**



Increment Standards

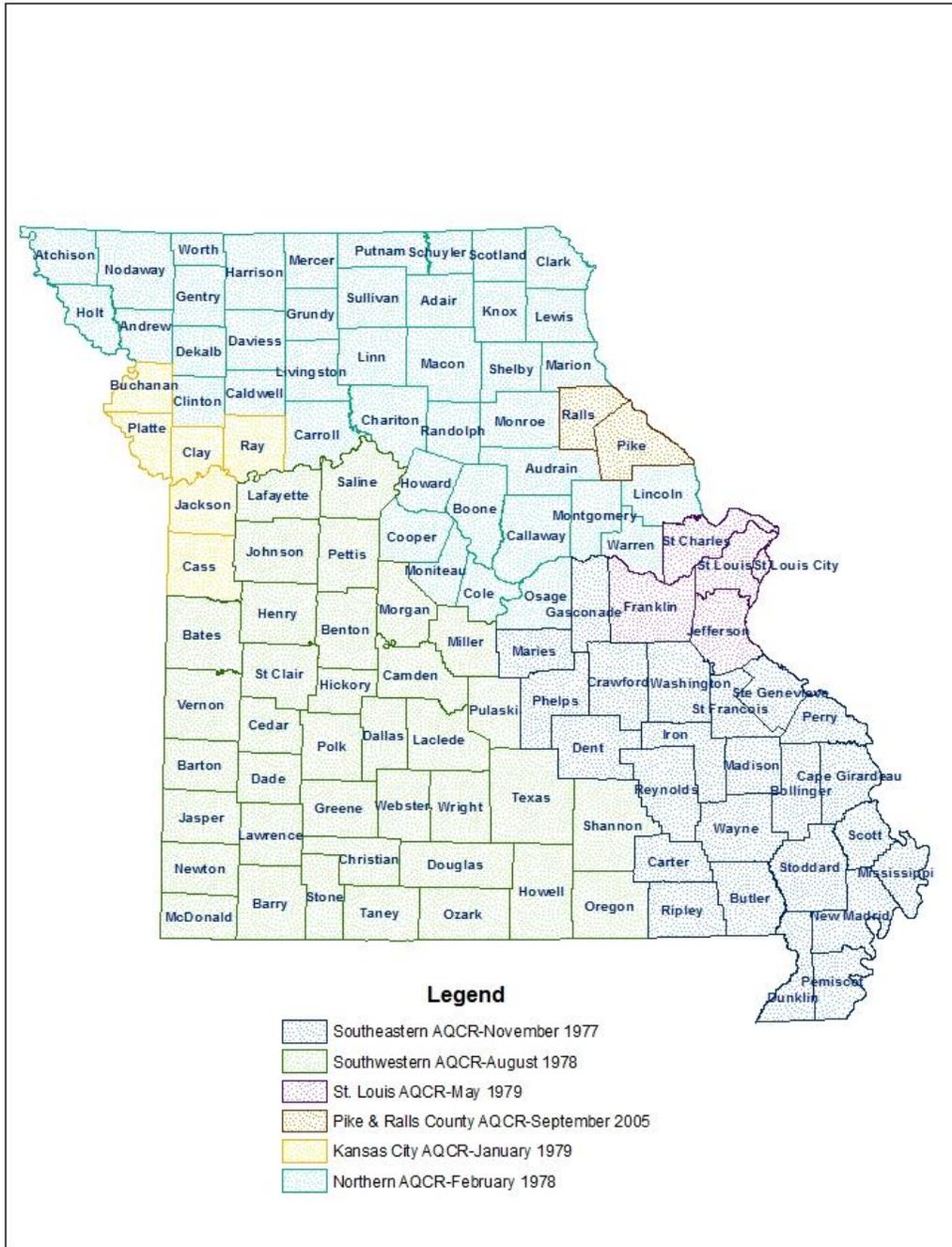
Figure 2
Section 107
Air Quality Control Regions
Pollutant-NO_x





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Figure 3
Section 107
Air Quality Control Regions
Pollutant-TSP/PM₁₀





Increment Standards

Figure 4
Section 107
Air Quality Control Regions
Pollutant-SO₂

