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Department of Health & Environment

Sam Brownback, Governor

MEMORANDUM

Date: March 27, 2017
To: File
From: Susana C. Pjesky ^{SUP} and Mindy G. Bowman ^{MGB}
Re: Establishment of Minor Source Baseline Dates (a.k.a. Baseline Dates) in Kansas

I. BACKGROUND INFORMATION ON PSD INCREMENT

The requirement to evaluate increment consumption is one of the important aspects of the Prevention of Significant Deterioration (PSD) permitting review. Increment is the maximum allowed increase in concentration that is allowed to occur above a baseline concentration for a pollutant. Baseline concentration is defined for each pollutant (and relevant averaging time) and, in general, is the ambient concentration existing at the time that the first complete PSD permit application affecting the area is submitted. On or before the date of the first complete PSD application, most emissions are considered to be part of the baseline concentration; and emissions changes which occur after that date affect the amount of available PSD increment. **Significant deterioration in air quality is said to occur when the amount of new pollution would exceed the applicable PSD increment.** Table 1 shows the PSD increment for PM_{2.5}, PM₁₀, SO₂ and NO₂, at different averaging periods and at different area classifications (Class I, Class II or Class III). Currently, the State of Kansas only has Class II areas classification.

Table 1. Ambient air increment limitations from 40 CFR 52.21(c).

Pollutant	Averaging Period	Maximum allowable increase (µg/m ³)
		Class II Area
PM _{2.5}	Annual arithmetic mean	4
	24-hr maximum	9
PM ₁₀	Annual arithmetic mean	17
	24-hr maximum	30
SO ₂	Annual arithmetic mean	20
	24-hr maximum	91
	3-hr maximum	512
NO ₂	Annual arithmetic mean	25

To fully understand how and when increment is consumed or expanded, three different dates related to baseline concentration are important to understand. In chronological order, these dates are as follows: (1) major source baseline date; (2) trigger date; and (3) minor source baseline date. Table 2 shows the three different dates.

Table 2. Different dates related to baseline concentration determination.

Major source baseline date	Trigger date	Minor source baseline date (or the “baseline date”) in Kansas
NO ₂ : February 8, 1988 PM ₁₀ and SO ₂ : January 6, 1975 PM _{2.5} : October 20, 2010	NO ₂ : February 8, 1988 PM ₁₀ and SO ₂ : August 7, 1977 PM _{2.5} : October 20, 2011	For NO ₂ , see Table 4 For SO ₂ , see Table 5 For PM ₁₀ , see Table 6 For PM _{2.5} , see Table 7

The **major source baseline** date is the date after which actual emissions associated with construction at a major stationary source affect the available PSD increment. Other changes in actual emissions occurring at any other source after the major source baseline date do not affect the increment, but instead (until after the minor source baseline date is established) contribute to the baseline concentration. The **trigger date** is the date after which the minor source baseline date may be established. Both the major source baseline date and the trigger date are fixed dates. The **minor source baseline date** is the earliest date after the trigger date on which a complete PSD application is received by the permit reviewing agency. If the application that established the minor source baseline date is ultimately denied or is voluntarily withdrawn by the applicant, the minor source baseline date remains in effect nevertheless. Because **the minor source baseline date marks the point in time after which actual emissions changes from all sources affect the amount of available increment (regardless of whether the emissions changes are a result of construction), it is often referred to as the "baseline date."**

The minor source baseline date for a particular pollutant is triggered by a PSD applicant only if the proposed increase in emissions of that pollutant is significant. For instance, a PSD application for a major new source or modification that proposes to increase its emissions in a significant amount for SO₂, but in an insignificant amount for PM, will establish the minor source baseline date for SO₂ but not for PM. Thus, the minor source baseline dates for different pollutants (for which increments exist) need not be the same in a particular area.

Baseline area is the area in which the minor source baseline date is established by a PSD permit application. The extent of a baseline area is limited to intrastate areas and may include one or more areas designated as attainment or unclassified under Section 107 of the Clean Air Act. The PSD applicant's establishment of a baseline area in one State does not trigger the minor source baseline date in, or extend the baseline area into, another State. The baseline area established pursuant to a specific PSD application is to include (1) all portions of the attainment or unclassifiable area in which the PSD applicant would propose to locate, and (2) any attainment or unclassifiable area in which the proposed emissions would have a significant ambient impact. For these purpose (establishment of a baseline area), significant ambient impact occurs when the major source or major modification (establishing the minor source baseline date) **would construct or would have an air quality impact (for the pollutant for which the baseline date is established), as follows: equal to or greater than 1 µg/m³ (annual average) for NO₂, SO₂, or PM₁₀; or equal to or greater than 0.3 µg/m³ (annual average) for PM_{2.5}.**

Table 3. Summarizes the effects of the major source and minor source baseline dates on increment reduction or expansion.

<p>After major source baseline date, the following will impact the PSD increment:</p>	<p>After minor source baseline date, the following will impact the PSD increment:</p>
<p>Actual emissions associated with construction at a PSD major source that will affect the PSD increment (e.g., increases in actual emissions will consume increment).</p> <p>PSD increment inventory include:</p> <ol style="list-style-type: none"> 1) Existing <u>PSD major</u> sources that have undergone physical changes or changes in their methods of operation; and 2) New <u>PSD major</u> stationary sources 	<p>Actual emission from <u>all</u> sources (e.g., point, area or mobile sources) that will affect the available increment.</p> <p>PSD increment inventory include:</p> <ol style="list-style-type: none"> 1) Existing stationary sources that have undergone physical changes or changes in their method of operation; 2) Existing stationary sources that have increased hours of operation or capacity utilization; and 3) New stationary sources
<p>Changes in actual emissions occurring at any source (e.g., non-PSD major source) will not affect the PSD increment, but contributes to the baseline concentration</p>	<p>Baseline area (e.g., intrastate areas that include attainment and unclassified areas) will be established for pollutants for which the minor source baseline date is established that shows significant ambient impact (e.g., equal to or greater than 1 µg/m³ (annual average) for NO₂, SO₂ or PM₁₀; or equal or greater than 0.3 µg/m³ (annual average) for PM_{2.5}) after dispersion modeling.</p>
<p>Reduction of actual emissions resulting from a physical change or change in the method of operation at a major PSD stationary source would increase the amount of available increment (increment expansion). The reductions expand the available increment only if the reduction is included in a federally enforceable permit or SIP provision.</p>	<p>Reduction of actual emissions from any source would increase the amount of available increment (increment expansion).</p>

II. MINOR SOURCE BASELINE DATES ESTABLISHMENT IN KANSAS

The process of establishing the minor baseline dates in Kansas started in February 2012. All PSD permits issued in Kansas were searched in KDHE files. The PSD permits found were reviewed to determine if each PSD permit establishes the minor source baseline date(s) in Kansas. There were 27 PSD permits issued by EPA to 24 facilities in Kansas from 1976 to 1983; and there were 83 PSD permits issued by KDHE to 30 facilities in Kansas from 1984 to 2016. Tables 4, 5, 6 and 7 show the minor source baseline dates for NO₂, SO₂, PM₁₀ and PM_{2.5},

respectively. Figures 1, 2, 3 and 4 show the Kansas maps with minor source baseline dates for NO₂, SO₂, PM₁₀ and PM_{2.5}, respectively.

Table 4. Minor source baseline dates for NO₂ in Kansas as of October 31, 2016.

Facility Name	County	Minor Source Baseline Dates
Abengoa Bioenergy	Stevens	8/11/2011
Amsted Rail Company, Inc. (previously Griffen Wheel Company)	Wyandotte	8/10/2006
City of Chanute	Neosho	8/28/1989
City of Chanute	Wilson	8/28/1989
City of Chanute	Woodson	8/28/1989
City of Chanute	Allen	8/28/1989
City of Chanute	Bourbon	8/28/1989
City of Chanute	Montgomery	8/28/1989
City of Chanute	Labette	8/28/1989
City of Chanute	Crawford	8/28/1989
Empire District	Cherokee	2/26/1998
Frontier Refinery (formerly Texaco)	Butler	7/25/1994
Kingman (City of)	Kingman	4/25/1990
Lacey Randall Generation Facility, LLC/Tradewind Energy, Inc.	Thomas	11/22/2013
Mesa [Pioneer Natural Resources USA, Inc.]	Grant	4/30/1992
National Coop Refinery Association	McPherson	12/27/1990
Pratt (City of)	Pratt	1/25/1993
Russell (City of)	Russell	10/18/1989

Table 5. Minor source baseline dates for SO₂ in Kansas as of October 31, 2016.

Facility Name	County	Minor Source Baseline Dates
Abengoa Bioenergy	Stevens	8/11/2011
City of Beloit	Mitchell	11/30/1981
Columbian Chemical Company	Grant	1/15/2004
Cooperative Refinery Association, CRA, Inc. [subsidiary of Farmland, CRMA]	Montgomery	12/1/1977
Frontier Refinery (formerly Texaco)	Butler	7/28/2006
General Motors	Wyandotte	2/29/1981
General Motors	Johnson	2/29/1981
Great Plains Power (Atchison Generating Station)	Atchison	11/19/2003
Kansas Power and Light (Jeffrey Energy Center)	Pottawatomie	11/22/1977
Monarch Cement	Allen	11/15/1999
Sunflower Electric Coop. (Holcomb 1)	Finney	5/19/1978

Table 6. Minor source baseline dates for PM₁₀ in Kansas as of October 31, 2016.

Facility Name	County	Minor Source Baseline Dates
Abengoa Bioenergy	Stevens	8/11/2011
General Motors	Johnson	4/13/1981
Great Plains Power (Atchison Generating Station)	Atchison	11/19/2003
Lacey Randall Generation Facility, LLC/Tradewind Energy, Inc.	Thomas	11/22/2013
Sand Sage Power/Sunflower	Finney	1/10/2002

Table 7. Minor source baseline dates for PM_{2.5} in Kansas as of October 31, 2016.

Facility Name	County	Minor Source Baseline Dates
Abengoa Bioenergy	Stevens	12/20/2012
Abengoa Bioenergy	Grant	
Abengoa Bioenergy	Morton	
Lacey Randall Generation Facility, LLC/Tradewind Energy, Inc.	Thomas	11/22/2013
Mid-Kansas Electric Company, LLC	Grant	12/20/2012
Midwest Energy - Goodman Energy Center (was issued as a non-PSD permit, but still triggered the minor source baseline date)	Ellis	3/28/2014

Nitrogen oxide (NO2) Minor Source Baseline Dates and Baseline Areas in Kansas (as of March 31, 2017)

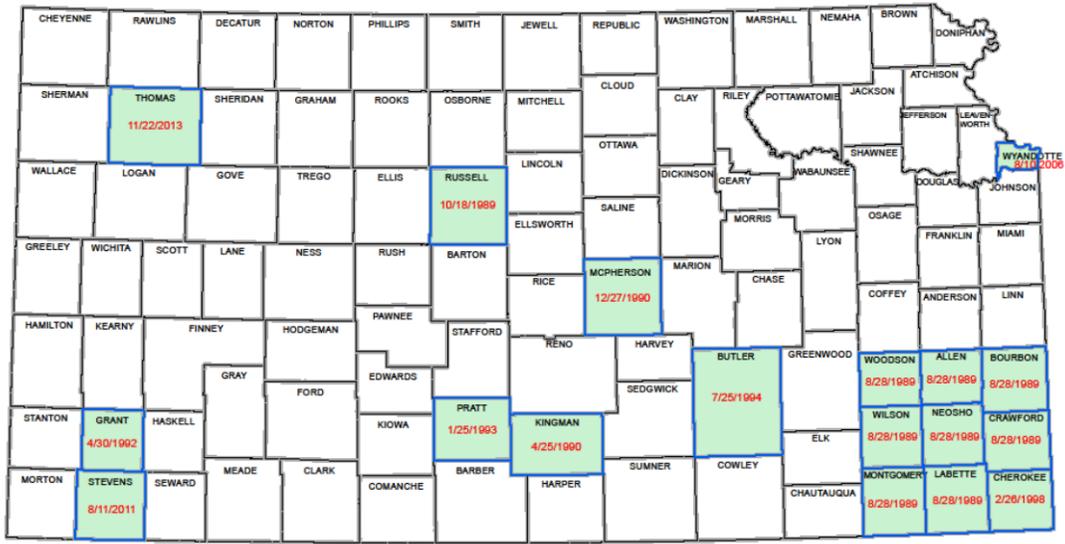


Figure 1. NO₂ minor source baseline dates and baseline areas in Kansas as of March 31, 2017.

Sulfur dioxide (SO2) Minor Source Baseline Dates and Baseline Areas in Kansas (as of March 31, 2017)

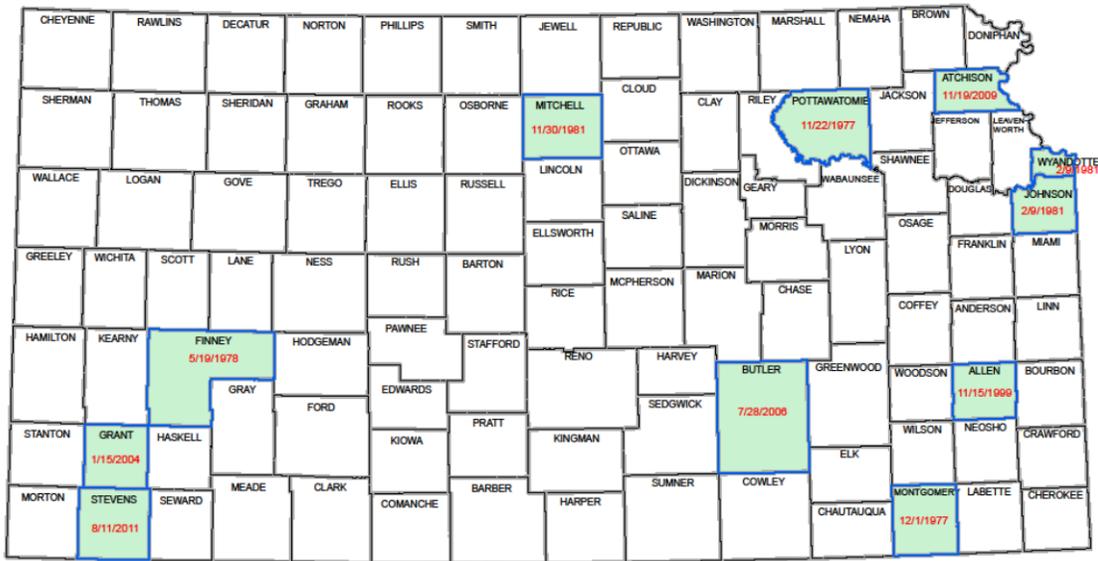


Figure 2. SO₂ minor source baseline dates and baseline areas in Kansas as of March 31, 2017.

Particulate matter with less than or equal to 10 um aerodynamic diameter (PM10)
 Minor Source Baseline Dates and Baseline Areas in Kansas (as of March 31, 2017)

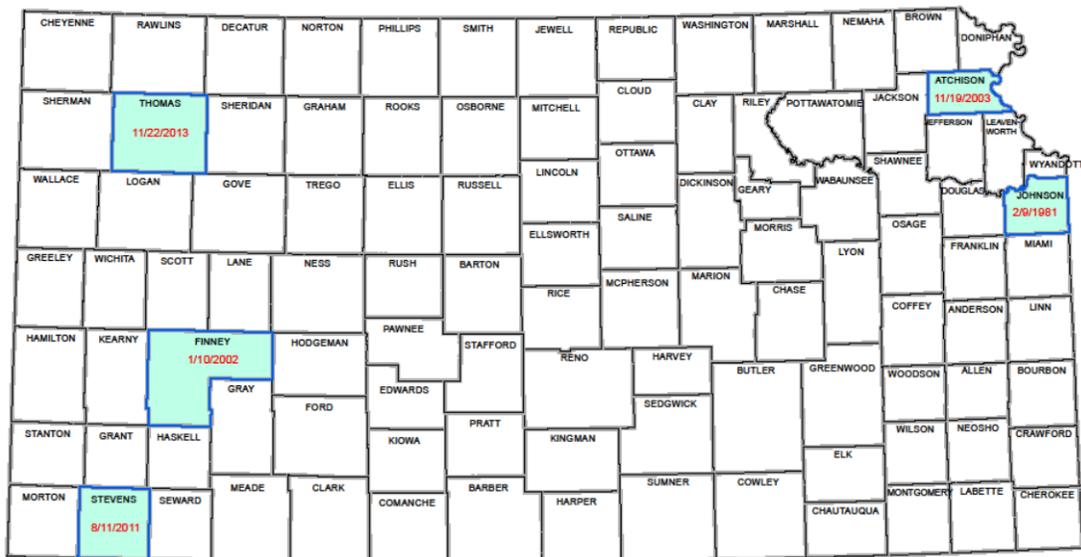


Figure 3. PM₁₀ minor source baseline dates and baseline areas in Kansas as of March 31, 2017.

Particulate matter with less than or equal to 2.5 um aerodynamic diameter (PM2.5)
 Minor Source Baseline Dates and Baseline Areas in Kansas (as of March 31, 2017)

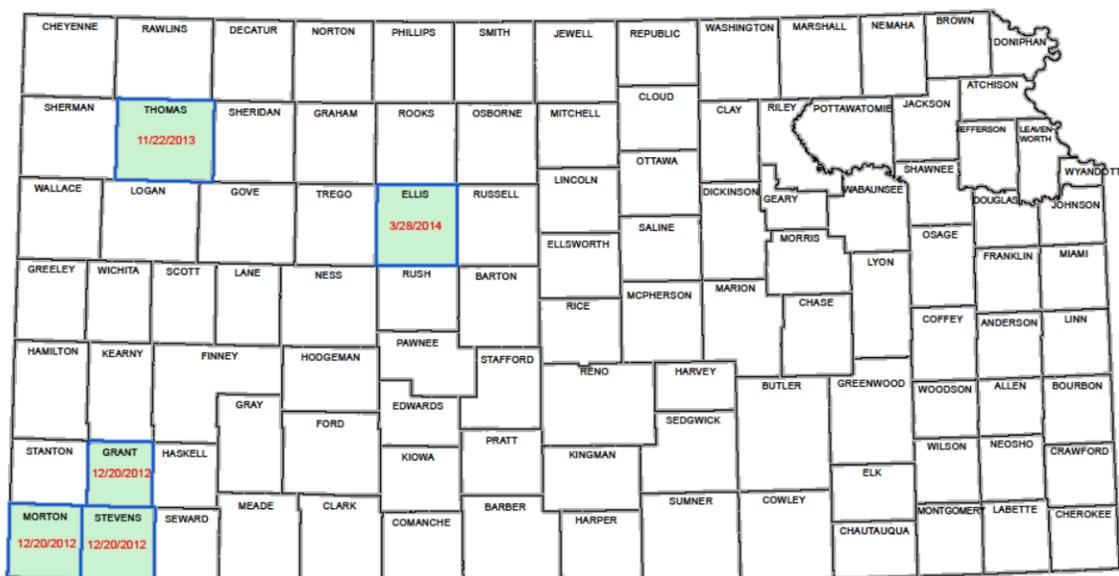


Figure 4. PM_{2.5} minor source baseline dates and baseline areas in Kansas as of March 31, 2017.

III. IMPORTANT DEFINITIONS (from 40 CFR 52.21)

What are the Major Source Baseline Dates?

40 CFR 52.21(b) (14)(i) Major source baseline date means:

- (a) In the case of PM₁₀ and sulfur dioxide, January 6, 1975;
- (b) In the case of nitrogen dioxide, February 8, 1988; and
- (c) In the case of PM_{2.5}, October 20, 2010.

What are the Minor Source Baseline Dates?

40 CFR 52.21(b) (14) (ii) “Minor source baseline date” means the earliest date after the trigger date on which a major stationary source or a major modification subject to 40 CFR 52.21 or to regulations approved pursuant to 40 CFR 51.166 submits a complete application under the relevant regulations. The trigger date is:

- (a) In the case of PM₁₀ and sulfur dioxide, August 7, 1977;
- (b) In the case of nitrogen dioxide, February 8, 1988; and
- (c) In the case of PM_{2.5}, October 20, 2011.

What is a Baseline Area?

(15)(i) *Baseline area* means any intrastate area (and every part thereof) designated as attainment or unclassifiable under section 107(d)(1)(A)(ii) or (iii) of the Clean Air Act in which the major source or major modification establishing the minor source baseline date would construct or would have an air quality impact for the pollutant for which the baseline date is established, as follows: equal to or greater than 1 µg/m³ (annual average) for SO₂, NO₂, or PM₁₀; or equal or greater than 0.3 µg/m³ (annual average) for PM_{2.5}.

What is included in the Baseline Concentration?

40 CFR 52.21(b)(13)(i) *Baseline concentration* means that ambient concentration level that exists in the baseline area at the time of the applicable minor source baseline date. A baseline concentration is determined for each pollutant for which a minor source baseline date is established and shall include:

- (a) The actual emissions, as defined in 40 CFR 52.21(b)(21), representative of sources in existence on the applicable minor source baseline date, except as provided in 40 CFR 52.21(b)(13)(ii); and
- (b) The allowable emissions of major stationary sources that commenced construction before the major source baseline date, but were not in operation by the applicable minor source baseline date.

What is excluded from the Baseline Concentration and will affect the applicable Maximum Allowable Increase(s) (or the PSD Increment)?

40 CFR 52.21(b)(13)(ii) The following will not be included in the baseline concentration and will affect the applicable maximum allowable increase(s):

- (a) Actual emissions, as defined in 40 CFR 52.21(b)(21) of this section, from any major stationary source on which construction commenced after the major source baseline date; and

(b) Actual emissions increases and decreases, as defined in 40 CFR 52.21(b)(21) of this section, at any stationary source occurring after the minor source baseline date.

Increment expansion can occur in two ways. The primary way is through the reduction of actual emissions from any source after the minor source baseline date. The second way is from the reduction of actual emissions after the major source baseline date, but before the minor source baseline date, if the reduction is from a physical change in the method of operation at a major stationary source.

What are Actual Emissions?

40 CFR 52.21(b)(21)(i) *Actual emissions* means the actual rate of emissions of a regulated NSR pollutant from an emissions unit, as determined in accordance with paragraphs (b)(21)(ii) through (iv) of 40 CFR 52.21, except that this definition shall not apply for calculating whether a significant emissions increase has occurred, or for establishing a PAL under paragraph of this section. Instead, paragraphs (b)(41) and (b)(48) of this section shall apply for those purposes.

40 CFR 52.21(b)(21)(ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date and which is representative of normal source operation. The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

40 CFR 52.21(b)(21)(iii) The Administrator may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit.

40 CFR 52.21(b)(21)(iv) For any emissions unit that has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

References:

40 CFR 52.21(b) (21) Prevention of Significant Deterioration of Air Quality

October 1990 Draft New Source Review (NSR) Workshop Manual for PSD and Nonattainment Area Permitting