OFFICE OF THE GOVERNOR
STATE OF MONTANA

STEVE BULLOCK
GOVERNOR

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April 3, 2013

Howard Cantor
Acting Regional Administrator
United States Environmental Protection Agency
Region VIII, 8P-AR
1595 Wynkoop St.
Denver, CO 80202-1129

RE: Montana Sulfur Dioxide ($SO_2$) NAAQS Designations

Dear Mr. Cantor:

As you are aware, the U.S. Environmental Protection Agency (EPA) promulgated a revision to the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide ($SO_2$) on June 2, 2010 (75 FR 35520). Pursuant to 42 USC §7407, Congress directs EPA to submit a list of areas designated as nonattainment, attainment, or unclassifiable with respect to a new or revised NAAQS. Such lists of designated areas are due no later than two years following the promulgation of a new or revised standard, or June 3, 2012 unless the administrator has insufficient information to promulgate the designations, at which time the period may be extended for up to one year to June 3, 2013.

This letter and the information provided in the enclosed technical support documents outlines Montana's rationale and request for reconsideration of the proposed Nonattainment designation for Yellowstone County.

This response is the state's only opportunity to comment and to provide additional information. As such, should EPA disagree with Montana's justification for reconsideration of its Nonattainment designation, I am submitting a five factor analysis supporting a smaller, administratively appropriate Nonattainment area.

Finally, I ask the agency to also reconsider its decision to make no designation for the other 55 counties in our state. Montana originally designated all 56 counties in the state unclassifiable or attainment for the revised $SO_2$ NAAQS, but the EPA chose only to address Yellowstone County. Montana requests EPA follow 42 USC §7407, *et seq.* and designate those 55 counties as attainment or unclassifiable as defined within the code.

If you have any questions regarding the enclosed, please contact M. Eric Merchant, the

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Department's Air Quality Policy and Planning Supervisor, by telephone at (406) 444-1457 or by email at emerchant@mt.gov.

Sincerely,

STEVE BULLOCK
Governor

SB:sj

Enc.
cc: Tracy Stone-Manning, Director, Department of Environmental Quality
David Klemp, Chief, Air Resources Management Bureau
M. Eric Merchant, Air Resources Management Bureau

**TECHNICAL SUPPORT DOCUMENT**
**Montana Response to EPA Proposed Nonattainment Area Designation**
**June 2, 2010 Revised National Ambient Air Quality Standards for Sulfur Dioxide**

## I. EXECUTIVE SUMMARY

On June 2, 2010, EPA revised the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide ($SO_2$), adding a short-term 1-hour primary (health-based) standard of 75 parts per billion (ppb) expressed as the 3-year average of the 99$^{th}$ percentile of the annual distribution of daily maximum 1-hour average concentrations. The primary 24-hour and annual $SO_2$ NAAQS have been repealed under the revised rule, except as applicable for existing $SO_2$ Nonattainment areas in the state (Laurel, East Helena). The 3-hour secondary (welfare-based) NAAQS of 500 ppb has been retained. The revisions were published in the Federal Register (FR) on June 22, 2010 at 75 FR 35520.

Pursuant to 42 USC §7407, *et seq*., Montana was obligated to submit to EPA an initial list of geographic areas that attain the standard, do not attain the standard, or that are otherwise unclassifiable based on available information. In a May 27, 2011 letter, Director Richard Opper, under the authority of Governor Brian Schweitzer, requested that all 56 counties in Montana be designated as Attainment or Unclassifiable in accordance with 42 USC §7407.

On February 6, 2013, EPA responded to Montana's initial designations disagreeing with Montana's request to classify Yellowstone County as Unclassifiable but did not act on the remaining 55 counties. In its letter, EPA presents the case that all of Yellowstone County should be designated as Nonattainment for the 2010 1-hour $SO_2$ standard. The following evaluation provides additional information in support of Montana's original area designations, focusing on Yellowstone County as that is the only county EPA is acting on in its pending designation on June 3, 2013. Additionally, Montana requests EPA follow 42 USC §7407 and designate the remaining 55 counties as Attainment or Unclassifiable as defined within the code.

With respect to Yellowstone County, EPA utilized the 2009-2011 design value of 79 ppb monitored at the Coburn Road monitor in the Billings/Laurel area and identified it as a violation of the revised $SO_2$ NAAQS. However, the purpose and intent of a "Nonattainment" designation is to initiate a process to incorporate necessary enforceable, permanent, and quantifiable emissions reductions into the affected State Implementation Plan (SIP) to ensure that the area will achieve and maintain NAAQS attainment and adequately protect public health in a timely manner. If enforceable, permanent and quantifiable emissions reductions necessary to attain NAAQS compliance are already mandated under the existing SIP/Clean Air Act (CAA) or other federally enforceable mechanisms, a nonattainment designation is inappropriate.

It should be noted that the most significant changes in Billings/Laurel area $SO_2$ emissions during the 2008-2012 timeframe was an over 1,600 ton increase at the ExxonMobil – Billings Refinery (ExxonMobil) during 2010. This emissions increase was a direct result of catalyst performance testing under an $SO_2$ additive testing schedule pursuant to an EPA Office of Enforcement and Compliance Assurance (OECA) consent decree. This OECA consent decree-driven increase in ambient $SO_2$ in the Billings area during 2010 most certainly impacted the monitored exceedances at Coburn Road. It is reasonable to presume that the CAA does not expect states to revise SIPs when federal requirements in the consent decree interfere with attainment of the NAAQS (42 USC §7410(a)(3)(C)).

As can been seen in Figure 1 below, 2008 and 2010 stand out as high emissions years. 2010 emissions are high primarily due to uncontrolled testing as a result of the OECA consent decree. 2008 also includes early catalyst testing under that same consent decree. Years 2009, 2011, and 2012 represent similar and consistent operating conditions, reflect future operations and clearly establish a trend maintaining the NAAQS. Both 2008 and 2010 are not representative of future and ongoing emissions or ambient concentrations. These existing reductions in $SO_2$ emissions provide further assurance that the Billings/Laurel area will achieve compliance with the new 1-hour $SO_2$ NAAQS well before the required compliance date of June 2018. See Figure 1 below showing the Billings area combined facility $SO_2$ emissions for the past 5 years with the annual 99$^{th}$ percentile as monitored at Coburn Road.

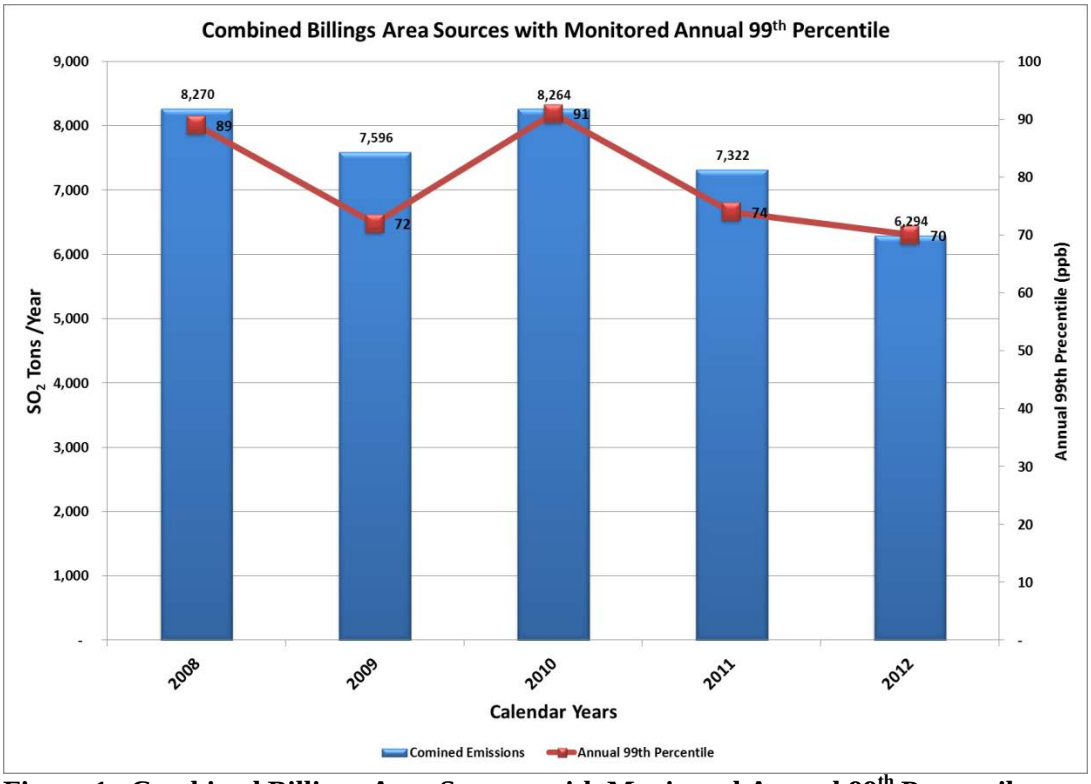


**Figure 1. Combined Billings Area Sources with Monitored Annual 99$^{th}$ Percentile at Coburn Road.**

In its February, 2013 "Next Steps for Area Designations and Implementation of the Sulfur Dioxide National Ambient Air Quality Standard" (Next Steps) document EPA outlines its strategy for designating all areas without violating monitors. EPA states that this Next Steps strategy "Provides incentives and time for air agencies and sources to reduce emissions early and potentially avoid nonattainment designation in certain areas, improving protection of public health sooner than would be otherwise required. This would occur if air agencies and sources take action to limit emissions (e.g., to comply with the Mercury and Air Toxics Standards (MATS) or other requirements) and demonstrate attainment with the 1-hour $SO_2$ NAAQS before future designation milestone dates pass." EPA has chosen to only act on areas with violating monitors, designating these areas as Nonattainment in accordance with 42 USC §7407. However EPA has failed to act on all other areas as required in 42 USC §7407. In the Next Steps strategy EPA is extending designation dates for the all the other areas by four to seven years with the intent to encourage areas to have the time for "air agencies and sources to reduce emissions early and potentially avoid nonattainment designation in certain areas, improving protection of public health sooner than would be otherwise required." Areas with existing violating monitors are not being afforded this same opportunity.

Montana has been engaged with the Billings/Laurel area stakeholders for a number of years and is well aware of significant $SO_2$ reductions made in the area. With those reductions and the completion of the OECA consent decree with respect to ExxonMobil, the Billings/Laurel area is seeing monitored values well within the NAAQS. EPA is using the 2009-2011 period, including the non-representative 2010 data, to calculate the Design Value. The inclusion of 2010 in the Design Value is the sole reason the area is showing a violation of the standard. EPA is using its discretion to extend the designation timelines well beyond what is outlined in 42 USC §7407 for all areas without violating monitors. Montana requests the same opportunities afforded the rest of the country.

Montana believes that 2010 Billings/Laurel area industrial $SO_2$ emissions and associated ambient impacts are not representative "normal" operations during that period or of future conditions in the area. The Department expects further SO2 reductions in the future with PPL Montana's announcement that the Corette power plant in Billings will be mothballed in April 2015. Further, if EPA provides this area with more time under EPA's Next Steps document, that time would be used to establish hourly emission limits for those sources and to evaluate where additional reductions need to be made to maintain air quality in Billings well below the $SO_2$ standard. Therefore, Montana strongly concludes that an initial designation of "Unclassifiable" for Yellowstone County is appropriate.

## II. BILLINGS AREA

### A. Sources/History and Emissions

In 1973, the first ambient $SO_2$ monitor was located in the Billings/Laurel area in response to both national and Montana ambient air quality standards and known large industrial emitters of $SO_2$ in the area. In 1976, EPA determined the SIP in the Billings/Laurel area was inadequate. In 1978, EPA designated the area surrounding the CHS Inc. Refinery (CHS, known at that time as Cenex) in Laurel as nonattainment based upon monitored violations of the NAAQS. In 1979, Montana submitted and EPA approved a SIP to address the violations and control ongoing emissions. Following modeled violations of the $SO_2$ standard, EPA called the SIP in 1993. Extensive work between Montana and the affected industries led to SIP submittals in 1996, 1998, and 2000. EPA eventually approved the SIP with a few notable exceptions. To that end, EPA adopted its own Federal Implementation Plan (FIP) in 2008 that adds additional $SO_2$ control requirements to the SIP. The FIP provisions may be delayed by litigation, but have not been rendered moot and will still apply to those facilities. As a result, it is logical to assume those requirements will be fulfilled and will result in a reduction of $SO_2$ emissions in the Billings airshed.

Seven industrial point sources that are significant emitters of $SO_2$ are located in the Billings/Laurel area and have been extensively involved in efforts with Montana to reduce $SO_2$ emissions. These facilities are listed below in Table 1 by city.

**TABLE 1. YELLOWSTONE COUNTY, MONTANA SIGNIFICANT SOURCES OF $SO_2$ BY LOCATION**

| Source | City |
|---|---|
| CHS, Inc. | Laurel |
| PPL Montana, LLC – J.E. Corette | Billings |
| Phillips66 Company | Billings |

| Source | City |
|---|---|
| Montana Sulphur & Chemical Company | Billings |
| ExxonMobil Refining & Supply Company | Billings |
| Yellowstone Energy Limited Partnership | Billings |
| The Western Sugar Company | Billings |

The CHS petroleum refinery is located in Laurel and the following sources are located in Billings: Montana Sulphur & Chemical Company (MSCC) sulfur recovery plant; ExxonMobil Refining & Supply Company (ExxonMobil) petroleum refinery; Phillips66 Company (Phillips66) petroleum refinery; PPL Montana, LLC - Corette (PPL-Corette) coal-fired power plant; The Western Sugar Cooperative (Western Sugar) sugar beet processing plant; and Yellowstone Energy Limited Partnership (YELP) petroleum coke-fired electrical/steam co-generation facility.

The Billings/Laurel area has made substantial progress in reducing $SO_2$ emissions. Some additional reductions are expected in the future based on efforts made to comply with forthcoming regulatory requirements (see discussion in Section II.C). Figure 2 illustrates the reductions realized in actual $SO_2$ emissions in the Billings/Laurel area from 1983 to 2012. In that timeframe, total emissions from the seven Billings/Laurel sources were reduced from approximately 35,000 tons per year to approximately 6,287 tons per year in 2012, see Figure 2 below.

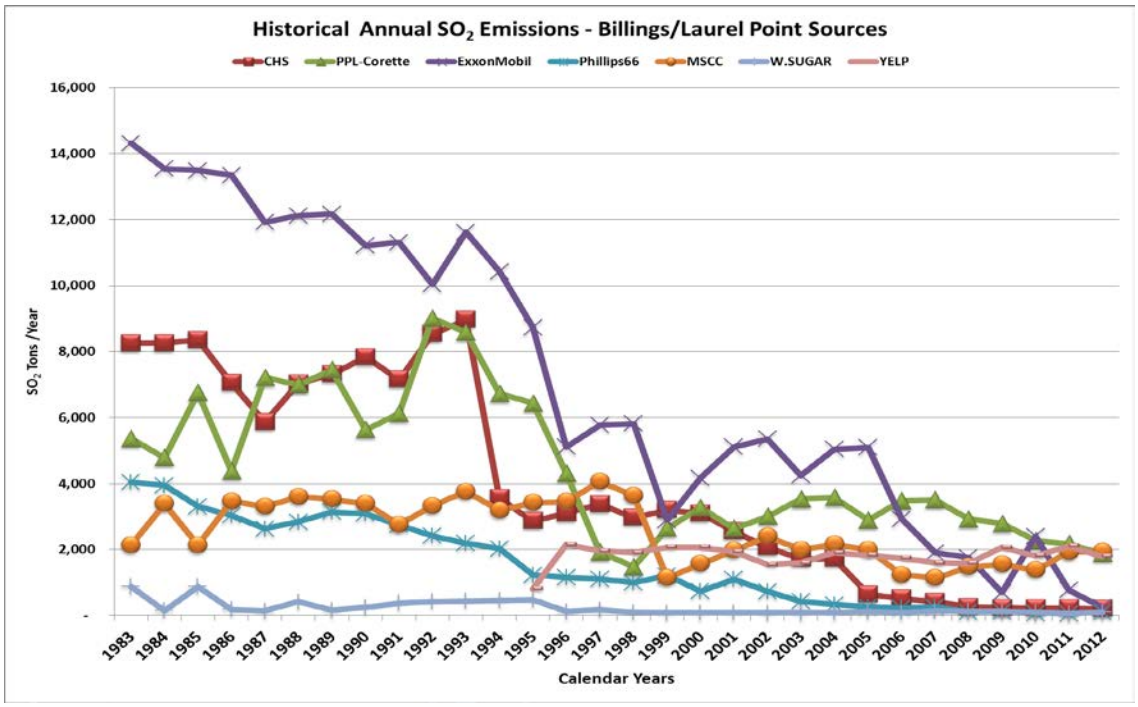


**FIGURE 2. HISTORICAL $SO_2$ EMISSIONS FROM THE BILLINGS/LAUREL INDUSTRIES**

Table 2 and Figure 3 below provide the estimated total combined emissions from the seven major facilities in the Billings/Laurel area for calendar years 2008 - 2012, including the years EPA proposes to use for the Design Value for designation purposes (2009-2011).

**TABLE 2. BILLINGS/LAUREL AREA COMBINED INDUSTRIAL $SO_2$ EMISSIONS**

| Emissions Year | Total $SO_2$ Emissions (tons/year) |
|---|---|
| 2008 | 8,270 |
| 2009 | 7,596 |
| 2010 | 8,264 |
| 2011 | 7,322 |
| 2012 | 6,294 |

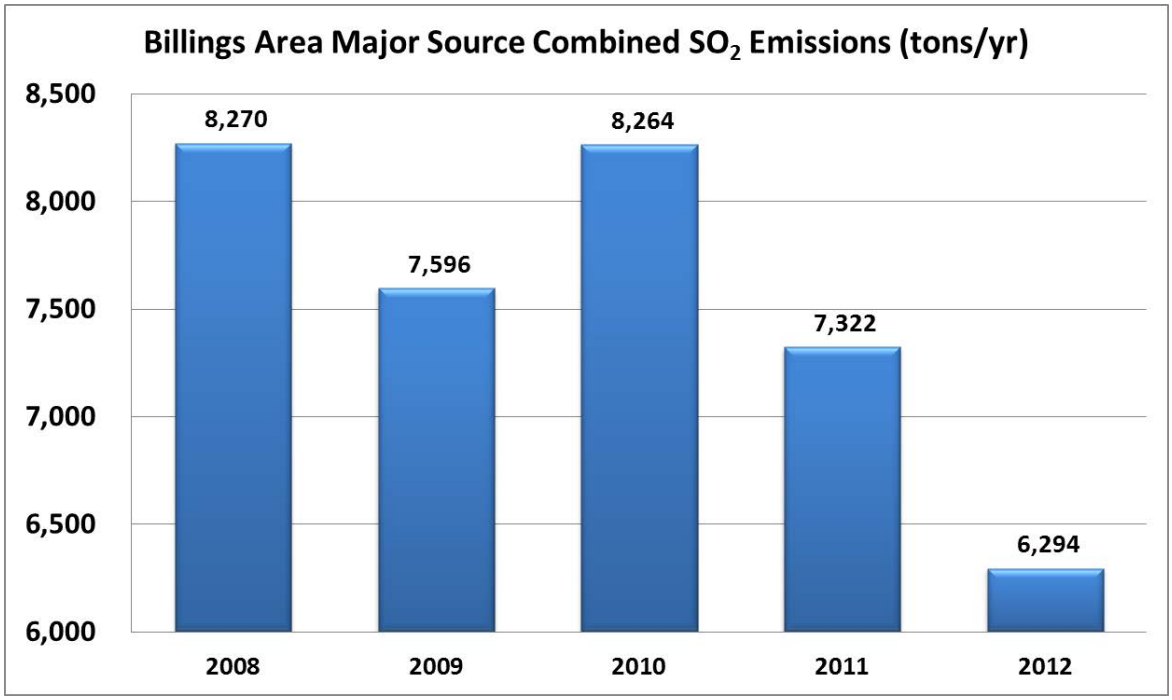


**FIGURE 3. BILLINGS AREA MAJOR SOURCE COMBINED $SO_2$ EMISSIONS**

As provided in Table 3 below, although some facilities showed annual variations with increases, the overall airshed has seen a decrease of over 1,900 tons/year or a 31% decrease. A significant portion of that reduction is a result of full implementation of the OECA consent decree. Table 3 below provides a comparison of annual emissions and emissions changes at each of the seven facilities over the 2010-2012 time period.

**TABLE 3, COMPARISON OF 2010 TO 2012 $SO_2$ EMISSIONS CHANGES BY SOURCE**

| Source | 2010 Emissions (tons $SO_2$/year) | 2012 Emissions (tons $SO_2$/year) | Difference (tons $SO_2$/year) | Percent Difference (%) |
|---|---|---|---|---|
| ExxonMobil | 2,398 | 257 | -2,141 | -833% |
| Phillips66 | 73 | 101 | +28 | +28% |
| CHS, Inc. | 225 | 210 | -15 | -7% |
| MSCC | 1,383 | 1,935 | +552 | +29% |
| PPL Corette | 2,271 | 1,884 | -387 | -21% |
| YELP | 1,816 | 1,801 | -15 | -1% |
| Western Sugar | 98 | 106 | +8 | +8% |
| **Total Emissions** | **8,264** | **6,294** | **-1,970** | **-31%** |

With respect to the "non-representative" emissions and ambient impacts, 2010 emissions at the ExxonMobil Billings Refinery increased more than 1,600 tons per year over either 2009 or 2011 levels. These additional emissions were entirely attributed to catalyst testing as required by the OECA consent decree in 2010 (including uncontrolled operation as a requirement of the testing scheme). This activity (and its associated emissions and ambient impacts) were clearly not representative of normal operations at the ExxonMobil Billings Refinery. Full implementation of the consent decree requirements through 2011 and 2012 saw dramatic decreases in emissions at ExxonMobil, decreases which are now federally enforceable under that consent decree.

Montana is aware that the other six major industrial sources in the Billings/Laurel area contribute to the $SO_2$ emissions being measured at the Coburn Road monitor. However, it makes no sense and provides no environmental benefit to the area to designate using a year of emissions data that are clearly not representative and will not reoccur. There is CAA precedent for program implementation using representative information. When determining the applicability of the New Source Review Program, proposed emissions increases are compared with "baseline actual emissions." "Baseline actual emissions" is defined under 40 CFR 52.21(b)(48)(iii) with the inclusion of the following sentence, "The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation."

As an example if the ExxonMobil Billings Refinery, as a major stationary source, were to propose a PSD netting analysis or modification application using 2010 as a "baseline" year under PSD regulations, Montana would reject that notion soundly, as would EPA on that same basis. The non-representative emissions included in the 2010 monitoring year should be implemented consistently across the CAA, with respect to permitting and ambient designation. Therefore, the 2010 emissions and monitoring year should be discarded from consideration as being not representative.

B. Monitoring Data

Montana and a consortium of industries known as the Billings/Laurel Air Quality Technical Committee (BLAQTC) have conducted $SO_2$ monitoring in the Billings/Laurel area for over 30 years. Over that period of time, $SO_2$ has been monitored at 31 locations in the Billings/Laurel area. Currently, Montana and the local public health agency, RiverStone Health (RiverStone), operate a single monitoring site and local $SO_2$-emitting industries operate four others.

At Montana's State and Local Air Monitoring Station (SLAMS) monitoring site located at Coburn Road in Billings, the 2009-11 design value of hourly concentrations of $SO_2$ in the ambient air is higher than the new 1-hour $SO_2$ NAAQS. As shown in Table 4 below the only annual 99$^{th}$ percentile value over the standard is the 91 ppb in 2010. The design value based on the 2009-11 time period is 79 ppb.

**TABLE 4. COBURN ROAD SLAMS 1-HOUR DAILY MAXIMUM $SO_2$ VALUES**
(* = 99$^{th}$ percentile value)

| 2009 | | | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Hr** | **ppb** | **Date** | **Hr** | **ppb** | **Date** | **Hr** | **ppb** | **Date** | **Hr** | **ppb** |
| 9/22/09 | 9 | 107 | 7/8/10 | 6 | 111 | 9/5/11 | 8 | 142 | 9/13/12 | 6 | 129 |
| 2/5/09 | 2 | 83 | 12/24/10 | 9 | 101 | 9/11/11 | 7 | 113 | 3/11/12 | 10 | 93 |
| 9/25/09 | 9 | 83 | 7/9/10 | 6 | 92 | 10/30/11 | 7 | 85 | 7/18/12 | 8 | 84 |
| **1/20/09** | **5*** | **72** | **2/10/10** | **4** | **91*** | **09/30/11** | **7** | **74*** | **11/3/12** | **8** | **70*** |
| 8/12/09 | 7 | 69 | 10/22/10 | 9 | 89 | 11/20/11 | 8 | 66 | 1/4/12 | 2 | 55 |

A summary of monitored NAAQS exceedances by quarter over the 2008-12 time period is provided in Table 5 below. As can been seen Calendar year 2010 included 10 of the 16 monitored NAAQS exceedances over the design value time period (2009-2011).

**TABLE 5. COBURN ROAD SLAMS MONITORED NAAQS EXCEEDANCES 2008-10**

| Calendar Year | Calendar Quarter | Number of Exceedances (> 75 ppb) |
|---|---|---|
| 2008 | 1 | 0 |
| | 2 | 1 |
| | 3 | 2 |
| | 4 | 3 |
| **2008 Total Exceedances →** | | **6** |
| 2009 | 1 | 1 |
| | 2 | 0 |
| | 3 | 2 |
| | 4 | 0 |
| **2009 Total Exceedances →** | | **3** |

| Calendar Year | Calendar Quarter | Number of Exceedances (> 75 ppb) |
|---|---|---|
| 2010 | 1 | 1 |
| | 2 | 0 |
| | 3 | 4 |
| | 4 | 4 |
| **2010 Total Exceedances →** | | **9** |
| 2011 | 1 | 0 |
| | 2 | 0 |
| | 3 | 0 |
| | 4 | 3 |
| **2011 Total Exceedances →** | | **3** |
| 2012 | 1 | 0 |
| | 2 | 1 |
| | 3 | 1 |
| | 4 | 1 |
| **2012 Total Exceedances →** | | **3** |

The following table (Table 6) provides a summary and comparison of the ten highest-per-day 1-hour $SO_2$ concentrations measured at the Coburn Road monitoring station for each year from 2008 through 2012. The measured values are listed in order of rank from highest to lowest (1$^{st}$ through 10$^{th}$ highest) for each year, and the highest value in each rank across all five years is shaded. Three parameters in the table demonstrate that the 2010 dataset was unique and not representative of normal ambient air quality in the monitored airshed. First, during the period from 2008 through 2012, seven of the highest ten monitored concentrations (70%) were measured within the single year of 2010. Second, the numbers of monitored hours that exceeded the NAAQS of 75 ppb were highest in 2010. Significantly, 2010 demonstrated 9 monitored 1-hour exceedances-- all but one of the listed values for the year, and a number equivalent to the years 2009, 2011, and 2012 combined (3 exceedances each). Third, the average of the ten highest monitored values was significantly greater in 2010 than in the four surrounding years. Notably, the average for 2008, 2009, 2011, and 2012 was 76 ppb, while the average for 2010 was 89 ppb, a difference of 13 ppb and an additional indicator of the 2010 departure from normal ambient air quality in this airshed.

**Table 6, Summary of Top Ten Monitored Values by Year at Coburn Road**

| Rank | Year | | | | | Summary by Rank | | |
|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | Min | Max | Avg |
| 1st | 119 | 107 | 111 | 142 | 129 | 107 | 142 | 122 |
| 2nd | 112 | 83 | 101 | 113 | 93 | 83 | 113 | 100 |
| 3rd | 95 | 83 | 92 | 85 | 84 | 83 | 95 | 88 |
| *4th* | *89* | *72* | *91* | *74* | 70 | *70* | *91* | *79* |
| 5th | 77 | 69 | 89 | 66 | 55 | 55 | 89 | 71 |
| 6th | 76 | 69 | 87 | 65 | 54 | 54 | 87 | 70 |
| 7th | 74 | 68 | 86 | 64 | 53 | 53 | 86 | 69 |
| 8th | 63 | 67 | 83 | 63 | 52 | 52 | 83 | 66 |
| 9th | 58 | 66 | 78 | 59 | 52 | 52 | 78 | 63 |
| 10th | 58 | 64 | 75 | 59 | 49 | 49 | 75 | 61 |
| Avg | 82 | 75 | **89** | 79 | 69 | 66 | 94 | 78.9 |
| # of NAAQS Exceedances | 6 | 3 | **9** | 3 | 3 | | | |

Notes:

- Values listed are the ten highest-hour-per-day values (not necessarily the ten highest monitored hours in a year -- i.e. several high hourly values may be measured in a 24-hour day, but only the highest is reported for NAAQS comparison purposes).
- The 4th High Rank is the 99th percentile value for each year and is used for NAAQS compliance comparisons in years with adequate data recovery per 40 CFR 50 Appendix T.
- Values listed are in units of parts per billion (ppb).
- Shaded values indicate the highest value in each rank (e.g. 95 is the highest 3rd-high value for the listed years, and it was recorded in 2008).
- 2012 data are not yet certified to EPA.

Montana operates an ambient air monitoring quality assurance and quality control (QA/QC) program for many reasons, among them to ensure the ambient air monitoring data supports and fulfills the operational, informational, and regulatory needs of the state. As part of this objective, Montana established the Ambient Air Monitoring Program Quality Management Plan (QMP). The QMP guides ambient air monitoring data collection activities. Montana has developed and maintains an EPA-approved Quality Assurance Project Plan (QAPP) and associated Standard Operating Procedures (SOP) to gather, review, and to evaluate ambient monitoring data in a consistent and defensible manner, including the ambient $SO_2$ monitoring in the Billings/Laurel area.

Figure 4 below shows the 3-yr average Design Values and the annual 99th percentile for the Coburn Road SLAMS. Both 2008 and 2010 stand out as odd years.

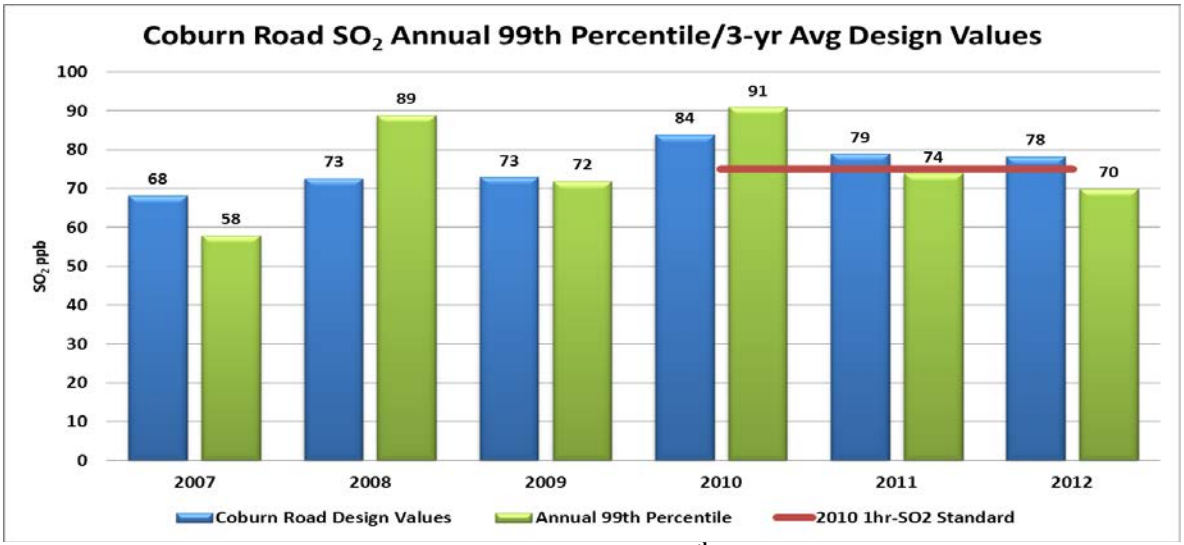


**FIGURE 4. COBURN ROAD $SO_2$ ANNUAL 99th PERCENTILE and 3-yr AVG DESIGN VALUES**

Table 7 below reviews and evaluates the past 6 years (07-12) of data at the Coburn Road SLAMS.

**TABLE 7. EVALUATION OF THE MOST RECENT 6 YEARS AT THE COBURN ROAD SLAMS.**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Average | Standard Deviation |
|---|---|---|---|---|---|---|---|---|
| Annual 99th PCTL | 58 | 89 | 72 | 91 | 74 | 70 | 75.7 | 12.4 |

The standard deviation of the annual 99th percentile over the past 6 years produces a statistical normal range of 63.2 ppb to 88.1 ppb. This range represents the reasonable values, where values outside of this range should be considered outliers or questionable data. Using this methodology years 2007, 2008 and 2010 are questionable values and do not fit the norm. This strongly supports the Departments original position that 2010 data is compromised and should not be used in the evaluation.

The Department believes that the analysis of monitoring information and the emissions data provided above clearly demonstrates that 2010 is not representative of air quality in the Billings area. Therefore 2010 data is inappropriate to use in the designation of the Billings airshed.

C. Regulatory Analysis

The original designation request included several regulatory programs that were in various stages of proposal and implementation as of May, 2011 (the date of that designation request). The following information provides more concrete information as those standards have evolved with respect to potential impacts on $SO_2$ emissions in the

Billings/Laurel area as well as responding to EPA's comments in their Technical Support Document (TSD), as necessary. As stated by EPA in the preamble to the June 2, 2010 $SO_2$ standard revision,

> "EPA … notes that it anticipates several forthcoming national and regional rules, such as the pending Industrial Boilers MACT standard under CAA section 112(d), that are likely to require significant reductions in $SO_2$ emissions over the next several years. A limited qualitative assessment based on the results of preliminary modeling of some sample facilities indicates that well controlled sources should meet the new $SO_2$ NAAQS."

The original analysis was developed based on that sentiment. Unfortunately, many of those regulations, as finalized, will have little or no impact on reducing $SO_2$ emissions, with two important exceptions: the full implementation of EPA's Refinery Initiative and the associated consent decrees and the expected implementation of EPA's Billings/Laurel $SO_2$ FIP.

i. EPA Refinery Initiative and Associated Consent Decrees

As discussed in the previous submittal, between 2002 and 2005, the Billings refineries and their respective parent companies each entered into a consent decree with US District Court, EPA, and the State of Montana. Consent decree requirements and projects have largely been completed at Phillips66 and CHS; however, as each refinery is on its own time schedule, ExxonMobil's consent decree involves changes at the refinery that were still being implemented during and after the 2008-2010 time period, which EPA describes as being "representative of normal emissions." EPA even goes so far as to state that higher emissions are representative just because they are higher, not because of any underlying conditions that were present or absent during that period. (EPA letter to Governor Bullock February 6, 2013)

The consent decree projects were and are critical to the emissions levels at ExxonMobil, both with respect to increases and decreases. During catalyst testing at the fluidized catalytic cracking unit (FCCU) in 2010, that included uncontrolled operation as a requirement of the testing scheme, emissions increased more than 1,600 tons per year over either 2009 or 2011 levels, yet is noted to be "normal" operations by EPA. Full implementation of the consent decree requirements through 2011 and 2012 saw dramatic decreases in emissions at ExxonMobil as shown in Table 8 below.

**TABLE 8. EXXONMOBIL $SO_2$ EMISSIONS FROM 2008-2012.**

| Facility | 2008 $SO_2$ Emissions (tons/yr) | 2009 $SO_2$ Emissions (tons/yr) | 2010 $SO_2$ Emissions (tons/yr) | 2011 $SO_2$ Emissions (tons/yr) | 2012 $SO_2$ Emissions (tons/yr) |
|---|---|---|---|---|---|
| ExxonMobil | 1,765 | 696 | 2,389 | 775 | 257 |

DEQ is well aware that other facilities contribute to the $SO_2$ emissions in the Billings/Laurel area. However, the State also believes that the additional emissions resulting from OECA consent decree (from uncontrolled testing) contributed to high values on the monitor. DEQ also believes that, because of the consent decree controls, that $SO_2$ emissions are unlikely to return to 2010 levels and that the 2010 year of emissions was an anomaly.

ii. Existing FIP Implementation

EPA states in their TSD, "The existing FIP has not been implemented due to ongoing litigation. Though the FIP has not been implemented, the State discusses aspects of the FIP as if it had been." As EPA is aware, the FIP provisions may be delayed by litigation, but have not been rendered moot and will still apply to those facilities. As a result, it is logical to assume those requirements will be fulfilled and will result in a reduction of $SO_2$ emissions (or they should, as that is the sole purpose for the existence of the FIP), even if they occur long after the original 1998 Montana $SO_2$ SIP for the Billings/Laurel area was partially disapproved.

For example, the FIP primarily applies to flaring events at the refineries (CHS, ExxonMobil, and Phillips66) and MSCC. Such flaring events arise from startup, shutdown and malfunction periods. The FIP requires the development of Flare Monitoring Plans which have been developed and submitted to EPA by the involved facilities. EPA has yet to approve those plans, apparently due to litigation. As flaring is almost exclusively a short-term intermittent activity that is in response to an upset condition, the full impact of the FIP will likely reduce short-term (1-hour and shorter) emission rates, which would ultimately be reflected in 1-hour monitoring values corresponding to the ambient standard, even further. No mention is made of these future emission reductions in EPA's TSD.

iii. Mercury Air Toxics Standard (MATS)/Utility MACT Implementation

EPA finalized and published the MATS, promulgated as 40 CFR 63, Subpart UUUUU, in the Federal Register on February 16, 2012. Two of the major facilities in the Billings/Laurel area would be subject to these requirements: PPL - Corette (as a "unit designed for coal > 8,300 British thermal units per pound (Btu/lb)" and YELP (as a "unit designed to burn solid oil-derived fuel"). The finalized MATS requirements included several emission limit options by category. The category of interest here is acid gas, in which the options include taking a hydrochloric acid limit or an $SO_2$ limit, which can only be used if the facility has some form of flue gas desulfurization (FGD) system and $SO_2$ CEMS installed.

Given the current lack of an FGD system in place and the low level of chlorine content in the Wyoming sub-bituminous coal burned, it is assumed that PPL – Corette would take a hydrochloric acid limit as opposed to an $SO_2$ limit. Similarly, based on the pre-MATS acid gas emissions data in the MATS information collection request for petroleum coke facilities, it is assumed that YELP would also be likely to take the hydrochloric acid limit. Any controls installed associated with the MATS PM/metals limit will provide a co-benefit of additional $SO_2$ control.

iv. Regional Haze / BART Implementation

EPA finalized and published Montana's Regional Haze FIP in the *Federal Register* on September 18, 2012. Two portions of this program had potential to impact industrial facilities in the Billings and Laurel areas: BART and reasonable progress. However, EPA's analysis resulted in only PPL - Corette ending up with additional limitations based on the Regional Haze FIP. With respect to $SO_2$, EPA stated in its response to comments in the final Regional Haze FIP, "…for Corette, the emission limits should reflect emission rates currently being achieved with existing controls."

Therefore, an additional $SO_2$ limit was added (0.57 lb/MMBtu averaged over a rolling 30-day period), but no additional emissions reductions would result in the Billings/Laurel area as a result of the Regional Haze FIP.

v. Boiler Maximum Achievable Control Technology (MACT) Implementation

The reconsideration of EPA's Boiler MACT standard for major sources was finalized and published as 40 CFR 63, Subpart DDDDD in the *Federal Register* on February 31, 2013. The Boiler MACT requires emission limits for various categories of large and small boilers. The rule also requires various energy audits and tune-ups of the boilers regardless of size and fuel. The energy audits and tune-ups are designed to lower fuel consumption; thereby lowering emissions. In the Billings and Laurel area, MSCC, PPL - Corette, ExxonMobil, CHS and Phillips 66 have units that will be impacted by the newly promulgated Boiler MACT for major sources. MSCC, PPL, ExxonMobil and Phillips 66 have gas-fired (either natural gas or refinery fuel gas-fired) boilers that appear to meet the applicability requirements of the finalized rule. As such, energy audits and tune-ups appear to be requirements of the rule for those units. The reduction in $SO_2$ is not quantifiable at this early date, but improvements in efficiency and tune-up are likely to lead to slightly lower emissions.

The reconsideration of EPA's Boiler MACT standard for area sources was finalized and published as 40 CFR 63, Subpart JJJJJJ in the *Federal Register* on February 1, 2013. The three coal-fired boilers at Western Sugar would be subject to the Hg and CO (as a surrogate for polycyclic organic matter) limits in this standard. At this time it is unclear what steps Western Sugar may take to meet the Hg emission limits listed in the area source rule. The three coal-fired boilers at Western Sugar are currently controlled using wet scrubbers. If scrubber upgrades are considered for Hg control, a co-benefit of $SO_2$ emissions reductions will be realized.

As stated, ongoing implementation of the national and local $SO_2$ limiting programs identified above will continue to result in $SO_2$ reductions from the affected $SO_2$ sources, particularly with respect to high concentration, short-term events (flaring, specifically, addressed by the FIP) that have particular impacts on a 1-hour standard.

D. Conclusion

The 2009-2011 design value monitored in the Billings/Laurel area is 79 ppb, an "apparent" violation of the revised $SO_2$ NAAQS. However, the purpose and intent of a "Nonattainment" designation is to initiate a process to incorporate necessary enforceable, permanent, and quantifiable emissions reductions into the affected state implementation plan (SIP) to ensure that the area will achieve NAAQS attainment and adequately protect public health in a timely manner. Montana recognizes the ongoing and near-future implementation of many existing federal $SO_2$ emissions limiting programs impacting $SO_2$ point source emissions in the Billings/Laurel airshed. These reductions in $SO_2$ emissions have already resulted in the Billings/Laurel area monitoring annual compliance with the new 1-hour $SO_2$ NAAQS. Years 2009, 2011, 2012 represent similar and consistent operating conditions, reflect future operations including enforceable, permanent, and quantifiable emissions reductions, and clearly establish a trend maintaining the NAAQS. Both 2008 and 2010 are not representative of future and ongoing emissions or ambient concentrations. These existing reductions in $SO_2$ emissions provide further assurance that the Billings/Laurel area will continue to show compliance with the new 1-hour $SO_2$ NAAQS well before the required compliance date of June 2018.

In fact, it should be noted that the most significant positive change in Billings/Laurel area $SO_2$ emissions during the 2008-2012 timeframe was an over 1,900 ton decrease to area-wide emission from 2010 to 2012. This significant reduction in emissions has been reflected on the monitor with reduction of the annual 99$^{th}$ percentile from 91 ppb to 70 ppb in 2010 to 2012 respectively. This emissions decrease was a direct result of full implementation of the OECA consent decree. The OECA driven emissions increase in 2010 corresponds directly to a majority of the documented NAAQS exceedances (10 of 16) for the 2009-2011 time-period. One may reasonably presume that the Clean Air Act does not expect states to revise SIPs when federal requirements in the consent decree interfere with attainment of the NAAQS (42 USC §7410(a)(3)(C)).

Further, the intent of ongoing and near-future implementation of federal $SO_2$ emissions limiting programs would be to reduce industrial $SO_2$ emissions nationwide and in the Billings/Laurel area to levels corresponding to compliance with the 2010 revised $SO_2$ NAAQS. Implementation of regulatory programs including the flare provisions from the FIP (delayed by litigation) and ExxonMobil-specific consent decree requirements (now fully implemented), will continue to reduce Billings/Laurel area $SO_2$ emissions and associated ambient concentrations. Additionally, PPL Montana has announced that the Corette power plant in Billings will be mothballed in April 2015.

Therefore, Montana believes that 2010 Billings/Laurel area industrial $SO_2$ emissions and associated ambient impacts are not representative of "normal" operating conditions or of future conditions in the area. Further, if EPA provides this area with more time under EPA's Next Steps document, that time would be used to establish hourly emission limits for those sources and to evaluate where additional reductions need to be made to maintain air quality in Billings well below the $SO_2$ standard. Therefore, Montana strongly concludes that an initial designation of "Unclassifiable" for Yellowstone County is appropriate.

Montana maintains its position that the $SO_2$ values for 2010 were influenced by an EPA OECA Consent Decree and are not representative of current or future ambient $SO_2$ concentrations in the Billings area. The following five-factor analysis is presented as justification for an appropriately sized Nonattainment Area (NAA), should EPA maintain its position that 2010 monitoring is representative and should be included in the design value at Coburn Road.

# TECHNICAL SUPPORT DOCUMENT

## Billings Area $SO_2$ Five Factor Analysis
## 2010 $SO_2$ 1-hour Standard

**April 3, 2013**

**Montana Department of Environmental Quality**
**Air Resource Management Bureau**

# Billings Area $SO_2$ Five Factor Analysis

## Table of Contents

# A. Introduction

In June of 2010, the United States Environmental Protection Agency (EPA) promulgated new National Ambient Air Quality Standards (NAAQS) for sulfur dioxide ($SO_2$). This action established a new 1-hour $SO_2$ standard at a level of 75 parts per billion (ppb), based on the 3-year average of the annual 99$^{th}$ percentile of 1-hour daily maximum concentrations. On May 27, 2011, Montana submitted its initial designation request to the EPA stating in part that Yellowstone County should be designated as unclassifiable due to unrepresentative monitoring data and pending Federal programs that will reduce $SO_2$ in the airshed. On February 6, 2013, EPA responded stating that they disagreed with Montana's initial designation and intends to designate all of Yellowstone County as Nonattainment for the 2010 1-hour $SO_2$ standard. EPA based its decision in part on monitoring results from the 2009-2011 period. Montana maintains its position that the $SO_2$ values for 2010 were influenced by an EPA Office of Enforcement and Compliance Assurance (OECA) Consent Decree and are not representative of current or future ambient $SO_2$ concentrations in the Billings area. However, should EPA maintain its position that 2010 emissions and monitoring data are representative, the following five-factor analysis is presented as justification for an appropriately sized Nonattainment Area (NAA).

Traditionally, absent other information, EPA has defaulted to the county boundary for defining the NAA. However, EPA has recognized larger or smaller areas based on an analysis of certain factors as defined in EPA's March 24, 2011 Memorandum regarding "Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards." As a matter of general principle and because Montana counties cover such large geographic areas, the Montana Department of Environmental Quality (Department) has opted to define smaller NAAs whenever a scientific analysis supports it. In this case ambient $SO_2$ concentrations are a direct result of industrial emissions confined to a small geographic area. Therefore, the Department has elected to conduct an analysis supporting designation of a NAA smaller than the county boundary proposed by EPA in their February 6, 2013 response to Montana's initial designation. This analysis follows.

On March 24, 2011, EPA released new $SO_2$-specific guidance that contains five factors to be analyzed when initially designating new $SO_2$ NAAs under the 2010 1-hour $SO_2$ NAAQS. The five factors are:

1. Air quality data
2. Emissions-related data (location of sources and potential contribution to ambient $SO_2$ concentrations)
3. Meteorology (weather/transport patterns)
4. Geography/topography (mountain ranges or other air basin boundaries)
5. Jurisdictional boundaries (e.g., counties, air districts, pre-existing NAAs, reservations, metropolitan planning organizations, etc.)

Because the Billings area is currently meeting the rescinded $SO_2$ standards and only monitored values in excess of the new 1-hour $SO_2$ standard, this document focuses only on issues related to the 2010 1-hour $SO_2$ standard.

# B. Five Factor Analysis

## 1. Air Quality Data

EPA states in their 2011 guidance document with respect to air quality data,

> "We intend to review $SO_2$ air quality monitoring data, including the design value calculated for each monitor in the area, for the most recent 3-year period. Areas where monitoring data indicate a violation of the 1-hour, 75 ppb primary $SO_2$ standard will be designated as "nonattainment.""…

$SO_2$ has been monitored in the Billings area in one form or another for four decades. In accordance with EPA's 2011 guidance the Department intends to use all monitoring data available in this analysis.

Figure 1 below shows the spatial relationship between the Billings area sources, Laurel and the other communities in the surrounding area. Figure 1 also shows the location of the existing ambient air monitoring sites, including the Department's site at Coburn Road, existing monitors in Laurel, Johnson Lane, the Brickyard monitor and the location of historical monitoring sites.

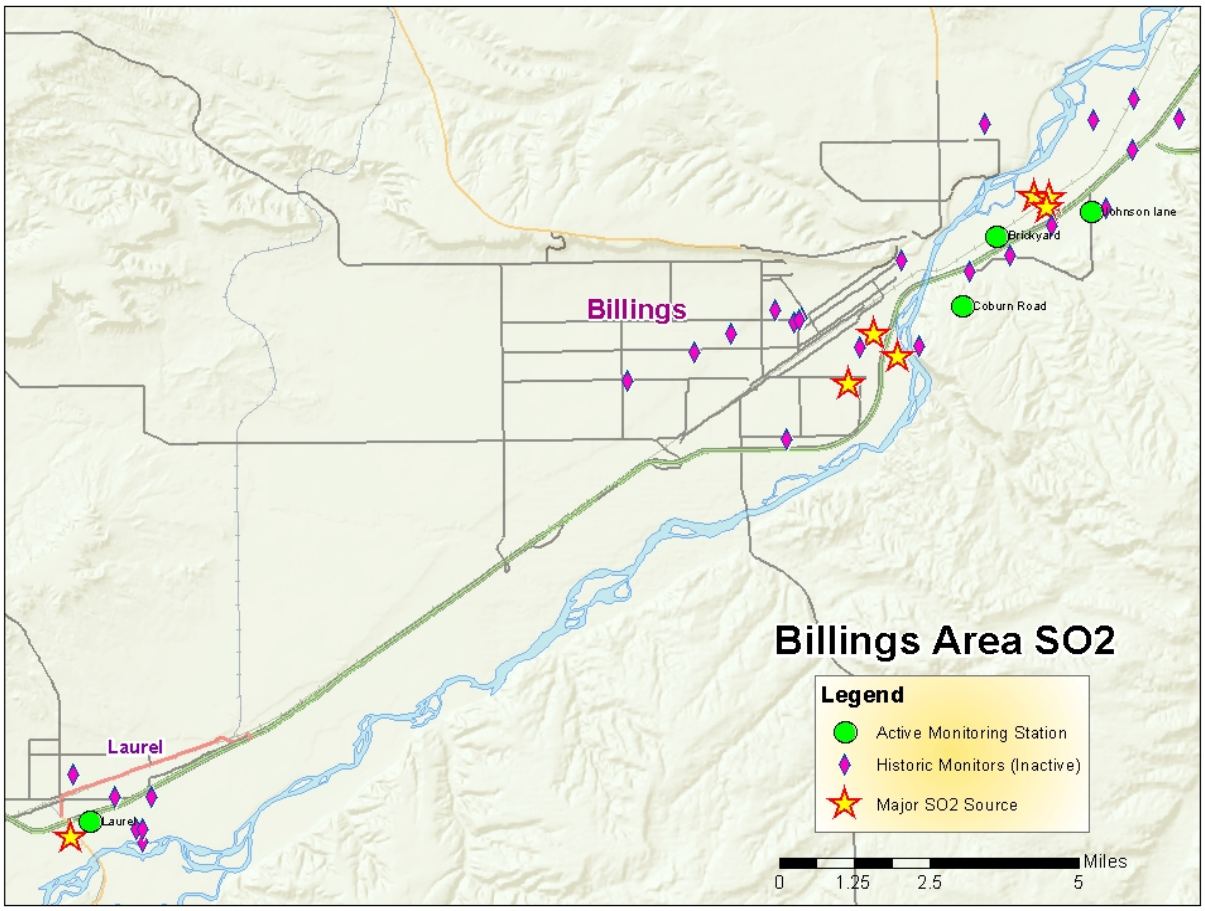


**Figure 1 – Billings Area $SO_2$ major sources, historical and active monitoring locations.**

Samples of ambient air are collected continuously every day at a Department run State and Local Air Monitoring Site (SLAMS) located at Coburn Road. Additional continuous $SO_2$ monitoring has historically been conducted in the Billings area, and three industrial sites are currently active. The locations of these monitors are shown in Figure 1 above. The site designated as "Johnson Lane" is operated as required by Montana Air Quality Permit #2650-07 issued to the Yellowstone Electric Limited Partnership (YELP, PQAO 1197). The site is required to meet Prevention of Significant Deterioration (PSD) monitoring requirements as detailed in 40 CFR Parts 53 and 58, and as established in a Quality Assurance Project Plan (QAPP) submitted to the Department in 2006. The Department believes that the Johnson Lane site has been operated in conformance with the applicable requirements and that the resulting data are of sufficient quality and quantity to be used in this NAAQS designation evaluation.

The sites designated as "Brickyard" and "Laurel" have been operated by a consortium of Billings industries known as the Billings Laurel Air Quality Technical Committee (BLAQTC); PQAO: Bison Engineering, 0102. The BLAQTC monitoring originally included a third site designated as "Lockwood" which was located between the Brickyard and Johnson Lane sites. This site suffered irreparable storm damage in May

of 2011 and has not operated since. However, prior to its termination the site produced data that is of value to this designation evaluation and is referenced in this document. The Lockwood and Laurel sites began monitoring in 1987, followed by the Brickyard site in 1989. The three sites are operated in accordance with a QAPP submitted to the Department in 1992 and revised in 2004 which commits to operation conforming to PSD monitoring requirements. The Department believes that the BLAQTC sites have been operated in conformance with the applicable requirements and that the resulting data are of sufficient quality and quantity to be used in this NAAQS designation evaluation. Data from both the YELP and BLAQTC sites has historically been entered into AQS. This data is currently being entered into the Departments database and is readily available to be uploaded into AQS.

As mentioned previously the Department has four decades of historical monitoring data collected at numerous sites in the greater Billings/Laurel urban area (see Appendix A – Billings Monitoring history – Bison). Those historical results indicate the Coburn Road SLAMS monitoring site tends to consistently monitor the highest $SO_2$ concentrations, on the average, of any monitoring site in the area.

The 2009-2011 Design Values from monitoring at the Coburn Road SLAMS and the other area sites are shown in Table 1 and Figure 2 below.

**Table 1. Billing's Area Monitors 2009-2011 Design Values (3 year average of the 99th percentile of the Annual 1-Hour Daily Maximum $SO_2$ Values (ppb))**

| Monitoring Location | 2009-2011 Design Value (ppb) |
|---|---|
| Coburn Road | 79 |
| Johnson Lane | 71 |
| Brickyard | 49 |
| Lockwood* | 67 |
| Laurel | 58 |

* The Lockwood monitor suffered irreparable storm damage in 2011 and has not been operated since. The Design Value used for Lockwood was 2008-2010 (including the higher emissions from both 2008 and 2010).

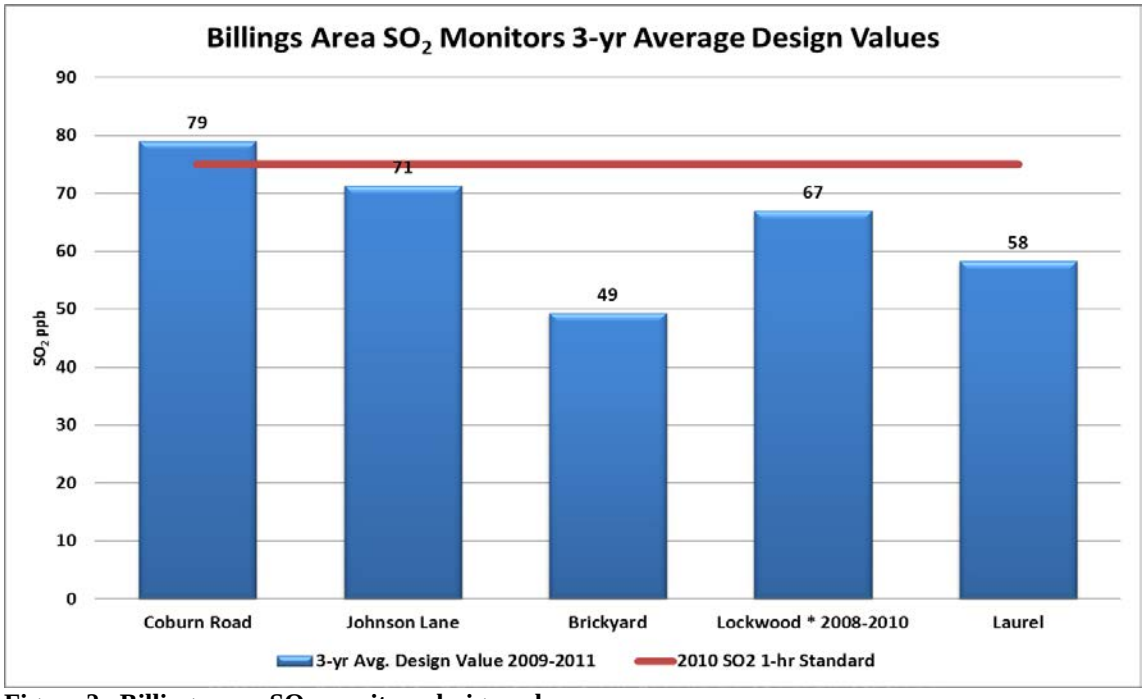


**Figure 2. Billings area $SO_2$ monitors design values.**

Table 2 and Figure 3 below show data collected using continuous instrumentation located at the Coburn Road SLAMS just east of downtown Billings.

**Table 2. Billing's Coburn Road Running 1-Hour $SO_2$ Standard Design Values (ppb)**
(Based on three year averages of annual 99th percentile 1-hour daily maximums)

| 2007-2009 | 2008-2010 | 2009-2011 | 2010-2012 |
|---|---|---|---|
| 73 | 84 | 79 | 78 |

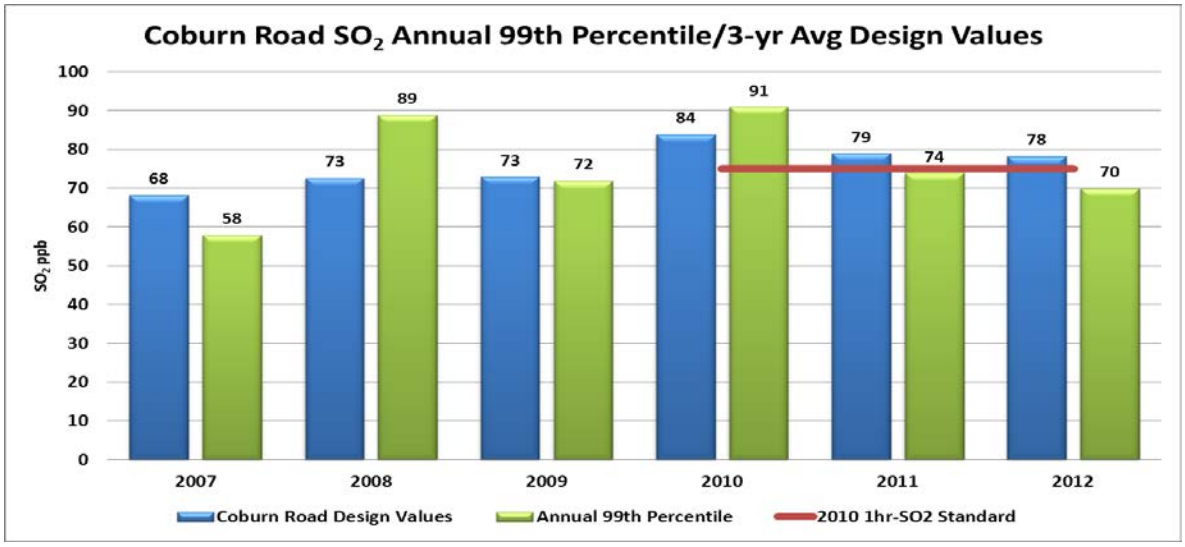


**Figure 3. Coburn Road Annual 99th percentile and Design Values (3-year average)**

CAA sec. 107(d)(1)(A)(i) defines nonattainment as any area that does not meet the national primary or secondary ambient air quality standard for the pollutant. Further 40 CFR 50.17(b) states "The 1-hour primary standard is met at an ambient air quality monitoring site when the three-year average of the annual (99th percentile) of the daily maximum 1-hour average concentrations is less than or equal to 75 ppb…" As shown in Table 1 and Figure 2 above, the design values for all the monitors in the area with the exception of Coburn Road SLAMS demonstrate attainment with the 2010 1-hour $SO_2$ standard. In accordance with 40 CFR 50.17(b), it is inappropriate to include areas with monitors demonstrating attainment with the standard within the boundary of a NAA.

The existence of monitors demonstrating attainment with the standard leads the Department to conclude that a smaller area, excluding areas of Yellowstone County shown by those monitors to be in attainment, is appropriate. Further CAA 107(d)(1)(A)(iii) defines Unclassifiable areas as "any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant." Based on that definition the portion of Yellowstone County devoid of major sources of $SO_2$ or monitoring information should be designated as unclassifiable or attainment.

## 2. Emissions-Related Data (location of sources and potential contribution to ambient $SO_2$ concentrations)

In 2012, there were approximately 24 industrial point sources in Yellowstone County but only seven significant sources of $SO_2$ emissions existed in the Billings/Laurel area. The significant sources of $SO_2$ emission are show in Figure 4 below and include the following sources in the Billings area:

- Cenex Harvest States (CHS) (petroleum refinery) in Laurel,
- The Western Sugar Cooperative (sugar beet processing plant),
- Phillips-66 (petroleum refinery),
- PPL – Corette (coal-fired power plant),
- Montana Sulphur & Chemical Co. (sulfur recovery plant),
- Exxon Mobil Corp. (petroleum refinery), and
- Yellowstone Energy Limited Partners (petroleum coke-fired electrical/steam co-generation facility).

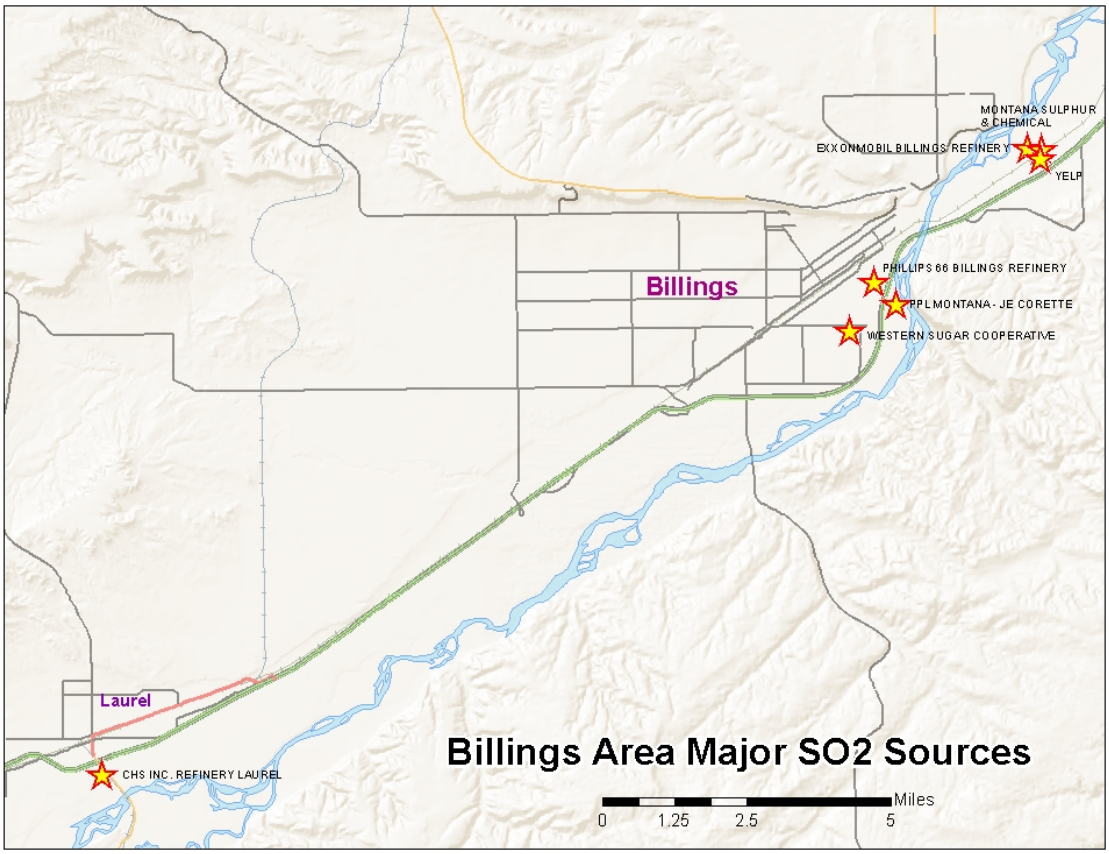


**Figure 4. Major $SO_2$ point sources in Yellowstone County.**

In 2012, the 24 industrial point sources in Yellowstone County emitted a total of approximately 6,300 tons of $SO_2$ (estimated actual emissions). The majority of the small point sources in Yellowstone County release a very small amount of the total, annual, area-wide $SO_2$ emissions. The seven major point sources mentioned in the preceding paragraph emitted an estimated 6,287 tons of $SO_2$ or 99.5% of the total $SO_2$ emissions in Yellowstone County in 2012. The eighth largest point source of $SO_2$ in the Billings airshed was the City of Billings waste water treatment plant at approximately 35 tons per year.

With respect to sources of $SO_2$ (both major and minor) nearby a nonattainment area, Montana's SIP-approved minor source permitting program (codified under ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources) is more stringent at lower levels than Montana's SIP-approved New Source Review (NSR) provisions (codified at ARM 17.8, Subchapters 9 and 10- Permit Requirements for Major Stationary Sources or Major Modifications Locating Within Nonattainment Areas (Subchapter 9) or Within Attainment or Unclassified Areas (Subchapter 10)). The provisions of the minor source permitting program take effect upon construction of a facility or emitting unit that has the potential to emit 25 tons per year (tpy) or the modification (construction or changed conditions of operation) of an existing facility that has the potential to emit greater than five tpy. NSR provisions take effect when a modification at a major stationary source results in a significant net emissions increase. Therefore, for a major stationary source emitting $SO_2$, the Montana minor source permitting provisions would take effect at a potential emissions increase of greater than 5 tpy, long before NSR provisions at 40 tpy.
In addition, the Montana provisions for de minimis changes take effect below that 5 tpy threshold pursuant to ARM 17.8.745. Although ARM 17.8.745 allows for changes to occur without permitting, exceptions to the rule exist that include "any construction or changed conditions of operation at a facility that would affect plume rise or dispersion characteristics of the emissions in a manner that would cause or contribute to a violation of an ambient air quality standard…"

Those provisions provide substantial protection. Pursuant to ARM 17.8.749(3), "A Montana air quality permit may not be issued for a new or modified facility or emitting unit ***unless the applicant demonstrates*** that the facility or emitting unit can be expected to operate in compliance with the Clean Air Act of Montana and rules adopted under that Act, the Federal Clean Air Act and rules promulgated under that Act (as incorporated by reference in ARM 17.8.767), and any applicable requirement contained in the Montana State Implementation Plan (as incorporated by reference in ARM 17.8.767), and ***that it will not cause or contribute to a violation of any Montana or national ambient air quality standard*** [emphasis added]." A similar demonstration would need to be made for a potential de minimis change that affected plume rise or dispersion characteristics.

As a result, far below the NSR significance level of 40 tpy, DEQ would be prohibited from issuing a permit or allowing a de minimis change for a new or modified emitting unit unless an applicant made the cause or contribute demonstration. However, as shown during the history of the program, instead of denying permit applications on this basis, DEQ has worked with applicants to further control or reduce emissions (and make those controls or reductions federally enforceable) so the appropriate demonstration can be made and the permit can be issued in compliance with ARM 17.8.749. In effect, the NSR provisions of offsetting and, in some respects, the Lowest Achievable Emissions Rate, are being used at the minor source permitting level to minimize impacts upon nonattainment areas and to ensure that the ambient standards are protected.

In addition, any major sources outside of the NAA will be subject to EPA's February 6, 2013 Policy titled "Next Steps for Area Designations and Implementation of the Sulfur Dioxide National Ambient Air Quality Standard." Under this policy states must demonstrate maintenance of the 2010 $SO_2$ 1-hour Standard in all areas of the state. This demonstration would include a modeling and/or monitoring compliance demonstration for all sources exceeding emissions thresholds as defined in the policy.

Figure 5 below shows the trends from 1983 through 2012 in the annual emissions from the seven largest $SO_2$ point sources in the Billings/Laurel area. As can be seen in Figure 5 emissions from all major sources in the Billings area have been declining significantly. The combined $SO_2$ emissions from all major sources have been reduced approximately 82% from over 35,000 tons/year in 1983 to 6,294 tons in 2012.

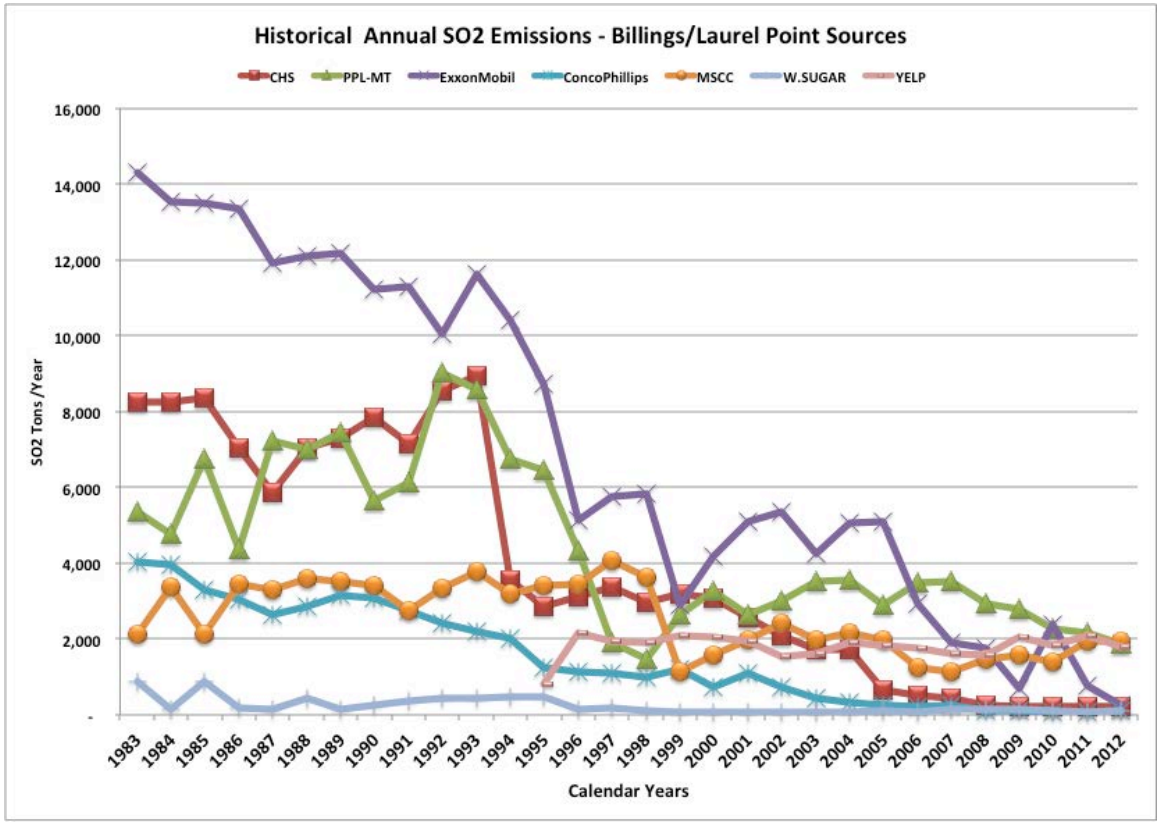


**Figure 5. Trends in annual actual $SO_2$ emissions from major point sources in the Billings/Laurel area from 1983-2012**.

A pollution rose for the design period is shown below in Figure 6 below. This pollution rose shows the $SO_2$ concentrations correlated with the direction the wind was blowing at the time of the reading. The pollution rose has been overlaid on top of an aerial photo of the Billings area. This figure clearly identifies that the upwind sources have the greatest impact at the monitor both in frequency and in concentration.

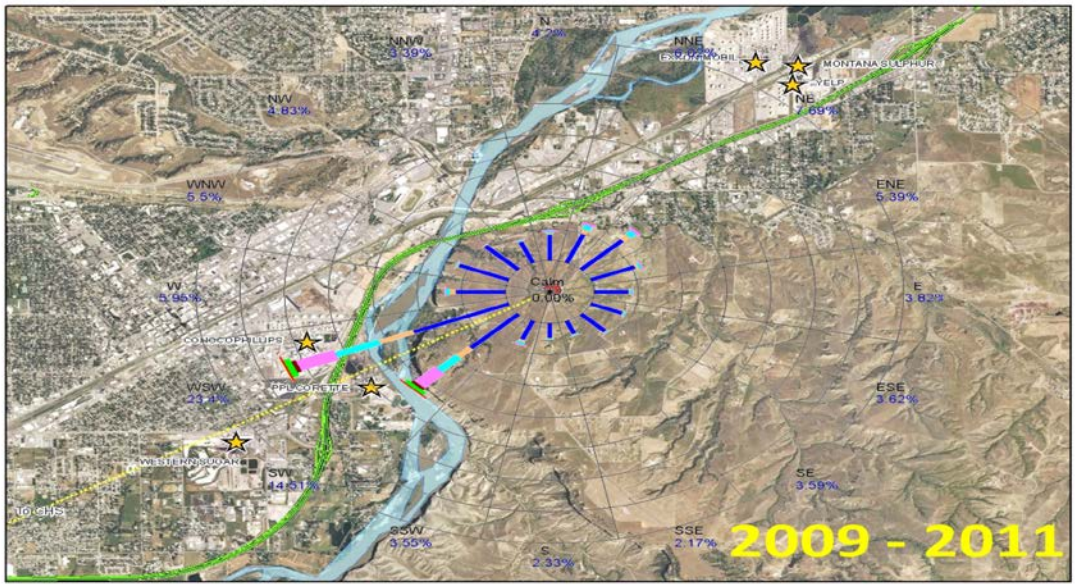


**Figure 6. Coburn Road SLAMS Pollution Rose for 2009-2011.**

The pollution rose above defines the direction of prevailing winds during high $SO_2$ readings at the monitor. As EPA states in its February 6, 2013 Technical Support Document (TSD), "exceedances are primarily driven from emissions blown from the southwest, which is the predominate wind direction."

Figure 7 below shows the annual emission from the four major upwind sources during the Design Value Period at the Coburn Road SLAMS. With respect to orientation the sources are depicted by distance to the monitor from left to right on the graph, with CHS being approximately 17.4 miles and the remaining sources approximately 2 miles southwest of the monitor. The emissions from PPL - Corette during the Design Value period are between 4.5 and 6 times the combined emissions of all other upwind sources.

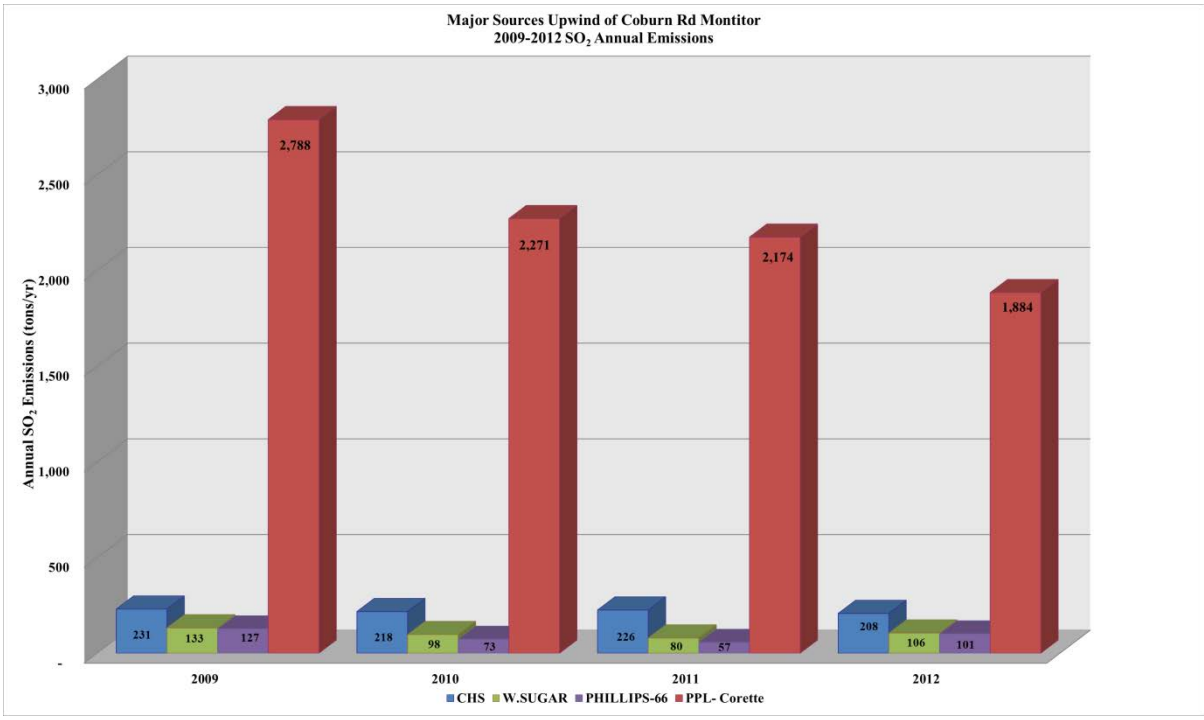


**Figure 7. Major Sources upwind of the Coburn Road SLAMS.**

Figure 8, 9, and 10 below show the monitored values at the Coburn Road SLAMS site compared with operating variances of all the upwind sources. These figures demonstrate that under a variety of operating scenarios the average ambient $SO_2$ concentrations at Coburn Road SLAMS decrease by nearly 80% when PPL-Corette is not operating. For example in calendar year 2012, the average ambient concentrations when PPL-Corette is operating ranges between 3.48 ppb to 3.83 ppb. In comparison when PPL-Corette is not operating the average ambient $SO_2$ concentrations is 0.93 ppb, an approximate 76% reduction. In addition, exceedances of the 2010 1-hour $SO_2$ standard have occurred only during times when PPL-Corette is operating.

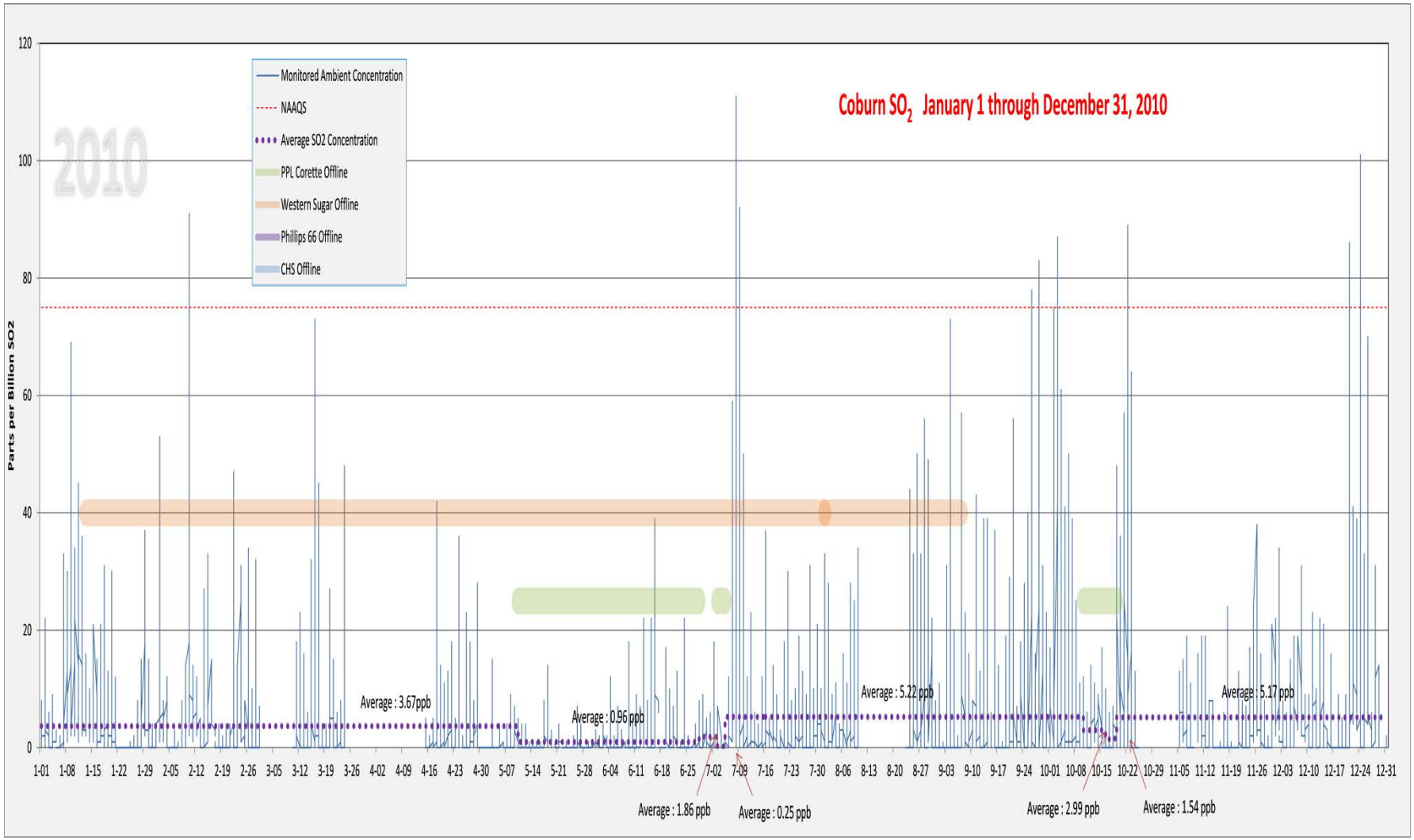


**Figure 8. Monitored hourly ambient monitored concentration at the Coburn Road SLAMS for calendar year 2010.**

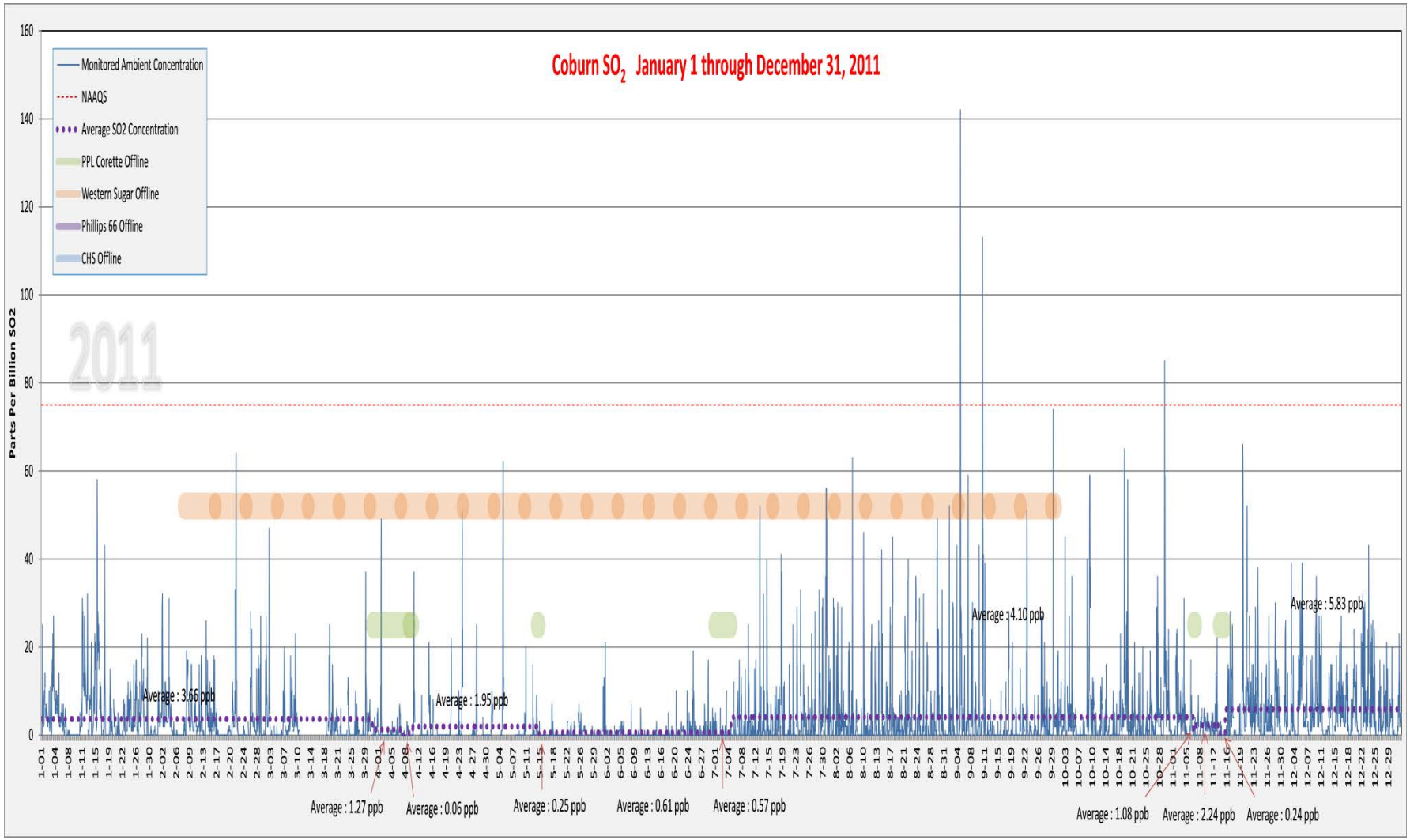


**Figure 9. Monitored hourly ambient monitored concentration at the Coburn Road SLAMS for calendar year 2011.**

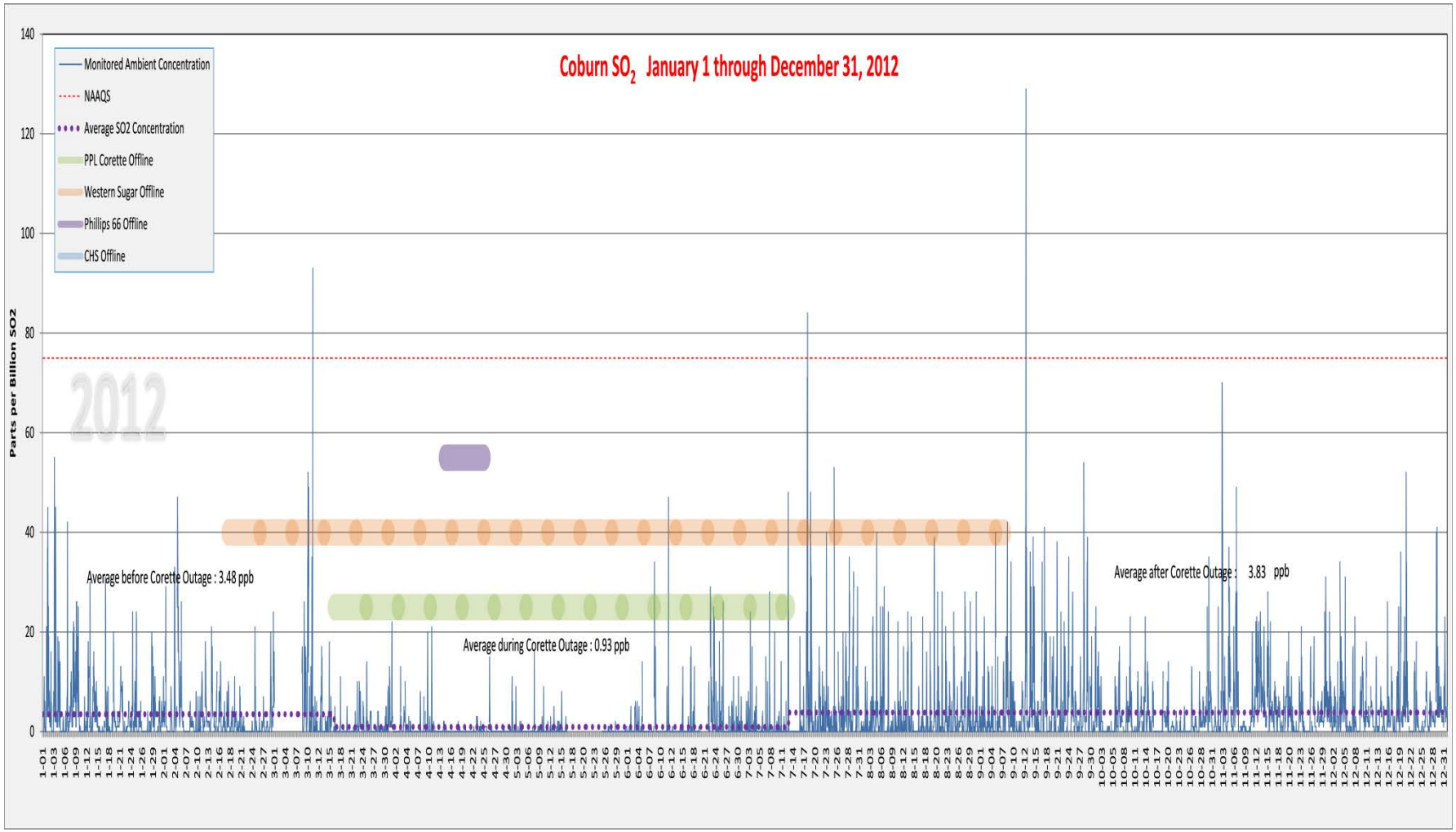


**Figure 10. Monitored hourly ambient monitored concentration at the Coburn Road SLAMS for calendar year 2011.**

In summary the Department concludes that the prior discussion of Emissions Related Data demonstrates that ambient $SO_2$ concentrations monitored at the Coburn Road SLAMS are primarily a result of PPL-Corette operations and resulting emissions. This conclusion supports including PPL-Corette within the NAA boundary.

## 3. Meteorology (weather/transport patterns)

Ambient levels of $SO_2$ in the Billings/Laurel airshed reflect the nature of the sources, terrain effects, and typical dispersion patterns. Most of the $SO_2$ emitted into the airshed is released from tall stacks with varying amounts of plume rise. These separate plumes may either loft up and out of the airshed, impact on nearby high terrain, or mix down to the ground either in a direct fashion during unstable conditions or as a fumigation episode related to inversion break up.

Dispersion patterns in the Billings/Laurel airshed have been studied extensively for more than 30 years. Most notable was a field study conducted in the early 1980s which included an acoustic sounder, three times weekly pilot balloon/t-sonde launches, surface meteorological monitoring, and a network of ambient $SO_2$ monitors. The dispersion in the area was re-visited in the 1990s during the development of the 1994 Billings/Laurel $SO_2$ State Implementation Plan (SIP). These studies and the resulting knowledge of dispersion patterns have greatly influenced the siting of monitors in the area.

The Design Value Period wind rose from the Coburn Road monitoring site shown in Figure 11 below reflects several important features that influence the wind patterns. The dominant and prevailing synoptic wind flow is from the west-southwest. This lines up almost exactly with orientation of the Yellowstone River Valley in this reach of the drainage. Although the sides of the valley are not as dramatic as those in the more mountainous areas to the west, they still provide for a noticeable channelization of the wind flow in the surface boundary layer of the atmosphere in this area. The wind rose below in Figure 11 characterizes the direction of prevailing winds readings at the monitor.

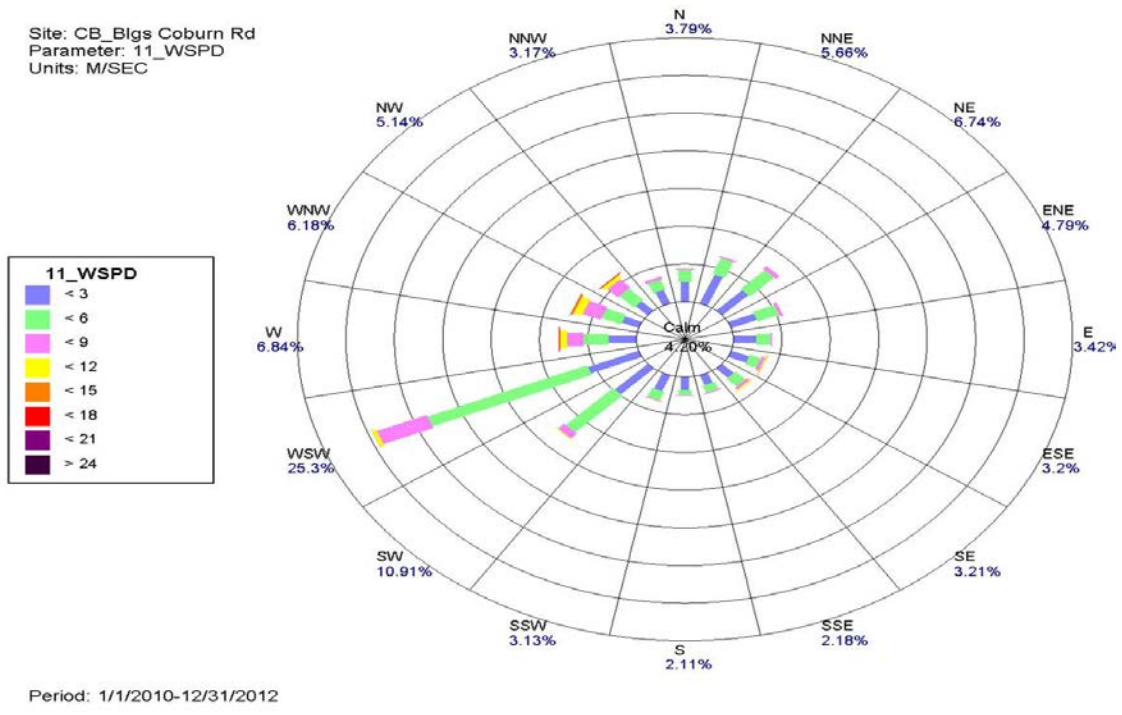


**Figure 11. Wind rose for the Design Value period from the Department's Coburn Road monitoring site.**

Billings sits at the juncture of both the mountains and the plains and exhibits some of the climatic features of both regimes. Clear skies and dry air are the usual pattern and nocturnal inversions form most nights so there is usually no intervening synoptic event. Without the geographic trapping common in mountain valleys to the west, day-long stagnation events are rare and multi-day events even rarer. During the winter of 2010-2011, which was the coldest and snowiest of the past decade, the airshed saw only one three-day stagnation episode and only three other individual days when the inversion lasted more than 24 hours. Outside of the winter season, stagnant periods which exceed 24 hours are very uncommon.

EPA states in its February 6, 2013 Technical Support Document (TSD), "exceedances are primarily driven from emissions blown from the southwest, which is the predominant wind direction." The Department is in agreement with EPA and concludes that the sources upwind from the Coburn Road SLAMS predominantly drive the ambient $SO_2$ concentrations.

## 4. Geography/topography (mountain ranges or other air basin boundaries).

The terrain in the vicinity of Billings and Laurel is a typical eastern Montana landform with an upland bench about 4,000 feet in elevation that is steeply cut by the Yellowstone River and its various tributaries, resulting in a rugged topography with a total vertical relief locally of 800 to 900 feet. Both Billings and Laurel are situated on the banks of the Yellowstone River which runs from west-southwest to east-northeast in this area.

Billings is located approximately 15 miles downstream (east-northeast) of Laurel. Laurel's elevation is approximately 3,300 feet while Billings' elevation is approximately 3,100 feet. The Yellowstone River valley is fairly broad near Laurel consisting of a mostly flat plain approximately 3 to 4 miles wide rising to elevations approximately 500 feet above the valley floor within about 1 mile to the north and about 2 miles to the south. The Clark's Fork of the Yellowstone River joins the Yellowstone River at Laurel cutting into the valley at a south-southwest angle.

The city of Billings is located at a significant constriction of the valley terrain that at its narrowest is only approximately 4,000 feet wide. The elevated terrain to the south, locally known as Sacrifice Cliff, is a sheer slope 500 feet higher than the valley floor. The elevated terrain on the north side of Billings, locally known as the Rimrocks, rises 400 feet just as steeply.

The bench land to the south is more rugged than the area to the north, rising to approximately 4,500 feet within 10 miles with steep slopes where the bench has been cut by erosion. To the north, the terrain is noticeably flatter rising to approximately 4,600 feet within 30 miles. See Figure 12 below.

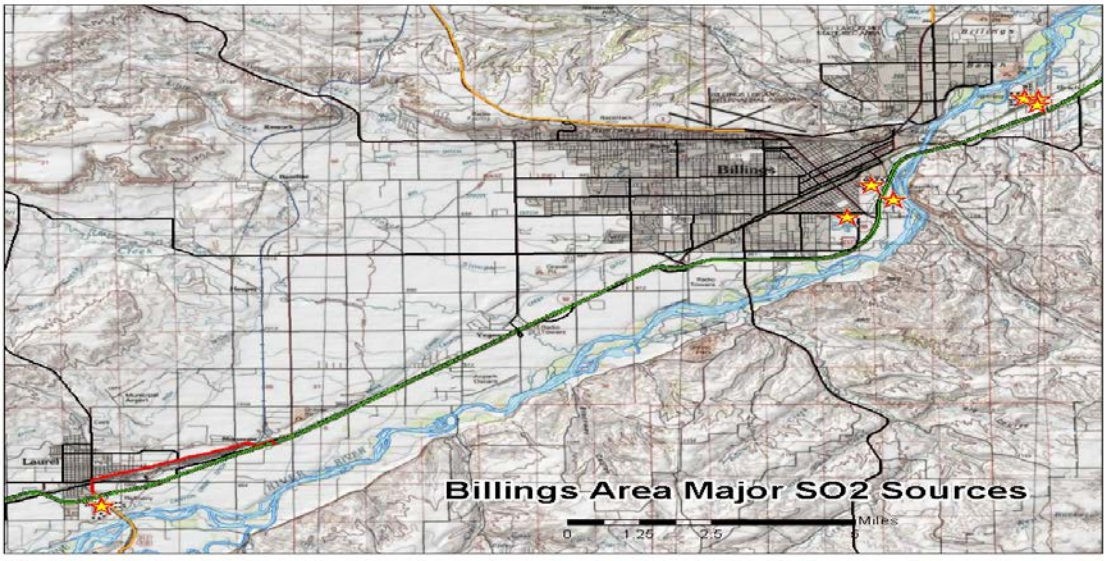


**Figure 12. Billings area topography.**

### 5. Jurisdictional Boundaries (e.g., counties, air districts, Reservations, etc.).

On February 6, 2013, EPA stated that they disagreed with MT's initial designation and intends to designate all of Yellowstone County as Nonattainment for the 2010 1-hour $SO_2$ standard. The 2010 $SO_2$ standard being a 1-hour limit based on the 99$^{th}$ percentile is designed to protect against localized, acute, short term exposures. Given the nature of $SO_2$ emissions in the Billings/Laurel area as a localized, rather than a regional pollutant, the new $SO_2$ NAA should protect against localized, acute, short-term exposures and should be significantly smaller than the entire county of Yellowstone as suggested by EPA. The logical approach is to define the new NAA using appropriate jurisdictional boundaries excluding areas with monitors demonstrating attainment with the 2010 1-hour $SO_2$ standard.

The 2011 $SO_2$ Guidance allows the use of formal physical and jurisdictional boundaries, including, county boundaries, section quadrants, topography, roads and other physical/jurisdictional boundaries as appropriate. The Department will use the appropriate boundaries with consideration of the other four factors to define the area as administratively efficient as possible.

## C. Proposed NAA

Montana is proposing a NAA including approximately 10.5 square miles ($mi^2$) as described below and shown in Figure 13.

> The proposed NAA originates at the point defined as the southwest corner of Section 11, Township 1S, Range 26E. From that point the NAA boundary proceeds north along the western section line of Section 11 to the point of intersection with the midline of Interstate Highway 90. From that point the boundary follows the midline of Interstate Highway 90, across the Yellowstone River, to the point where the highway midline intersects the northern boundary of Section 35, Township 1N, Range 26E. From that point the boundary proceeds east along the northern section line of Sections 35 and 31 to the point where Old US 87/Hardin Road leaves the section line and turns southeast. The boundary follows the midline of Old US 87/Hardin Road southeast to the point where the road intersects the western boundary of the SE ¼ of the SE ¼ of Section 31, Township 1N, Range 27E. From that point the boundary proceeds south along the ¼ section line to the southern boundary of Township 1N, then east to the northeast corner of Section 5, Township 1S, Range 27E. The NAA boundary then proceeds south along the eastern section line of sections 5 and 9 to the southeast corner of Section 9, Township 1S, Range 27E, where it turns west and follows the south section line of Sections 9 and 7, Township 1S, Range 27E; and Sections 12 and 11, Township 1S, Range 26E, back to the point of origin.

The NAA shown in Figure 13 below uses the appropriate jurisdictional boundaries and the prior five factor analysis to define the boundary of the proposed NAA. Montana's proposed NAA includes the violating monitor (Coburn Road SLAMS) and the primary source impacting that monitor. Further, the proposed NAA excludes the monitors and associated areas demonstrating compliance with the 2010 1-hour $SO_2$ Standard.

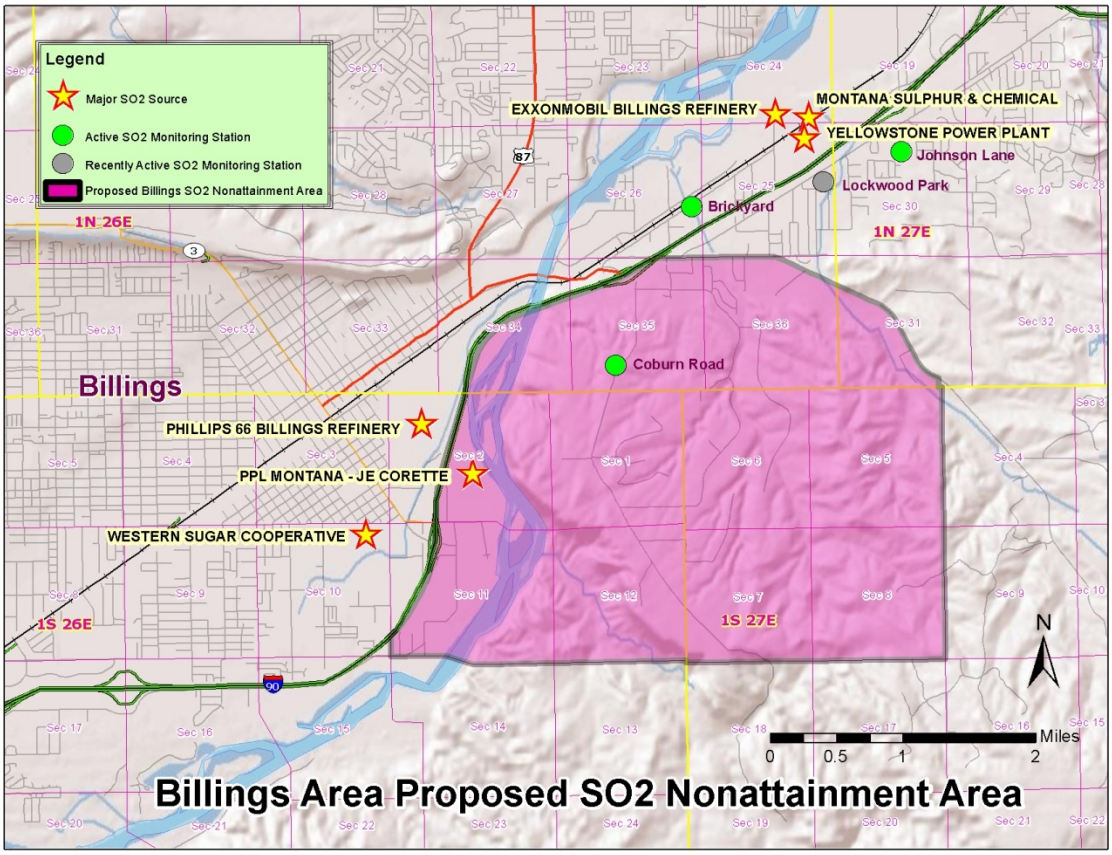


**Figure 13. The proposed Billings 1-hour $SO_2$ NAA.**

## C. Conclusion

EPA has proposed in its February 6, 2013 letter to Governor Steve Bullock that it intends to designate all of Yellowstone County Montana as Nonattainment for the 2010 1-hour $SO_2$ standard. The 2010 $SO_2$ standard being a 1-hour limit is designed to protect against localized, acute, short-term exposures. In support of this standard, the $SO_2$ NAA boundary should be defined to protect against such exposures and therefore should be significantly smaller than the entire county of Yellowstone, as proposed by EPA. As previously stated, ambient $SO_2$ is the direct result of industrial emissions and the significant sources of $SO_2$ in Yellowstone County exist only in the Billings/Laurel area. Based on the prior five factor analysis, Montana has demonstrated that a smaller NAA protecting against impacts from the local industries is appropriate.

Ambient air quality data collected at representative sites throughout the airshed over nearly four decades shows the Coburn Road SLAMS to be the highest concentration site. The other area monitors show compliance with the standard thereby limiting the extent. CAA sec. 107(d)(1)(A)(i) defines nonattainment as any area that does not meet

the national primary or secondary ambient air quality standard for the pollutant. Further 40 CFR 50.17(b) states, "The 1-hour primary standard is met at an ambient air quality monitoring site when the three-year average of the annual ($99^{th}$ percentile) of the daily maximum 1-hour average concentrations is less than or equal to 75 ppb…" As shown in Table 1 and Figure 2 in the prior five factor analysis, the design values for all the monitors in the area with the exception of Coburn Road SLAMS demonstrate attainment with the 2010 1-hour $SO_2$ standard. In accordance with 40 CFR 50.17(b), it would be inappropriate to include areas with monitors demonstrating attainment with the standard within the boundary of a NAA.

The existence of monitors demonstrating attainment with the standard leads the Department to conclude that a smaller area, excluding areas of Yellowstone County shown by those monitors to be in attainment, is appropriate. Further CAA 107(d)(1)(A)(iii) defines Unclassifiable areas as "any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant." Based on that definition the portion of Yellowstone County devoid of major sources of $SO_2$ or monitoring information should be designated as unclassifiable or attainment.

Emissions related data and meteorology have shown and EPA also concludes in its February 6, 2013 response that impacts at the Coburn Road SLAMS are primarily the results of emissions from those sources located to the southwest (upwind) of the monitor most notably PPL-Corette. The average ambient $SO_2$ concentrations at Coburn Road SLAMS decrease by nearly 80% when PPL-Corette is non-operational. For example in calendar year 2012, the average ambient concentrations when PPL-Corette is operating ranges between 3.48 ppb to 3.83 ppb. In comparison when PPL-Corette is not operating the average ambient $SO_2$ concentrations is 0.93 ppb, an approximate 76% reduction. In addition, exceedances of the 2010 1-hour $SO_2$ standard have occurred only during times when PPL-Corette is operating. In summary, the Department concludes that ambient $SO_2$ concentrations monitored at the Coburn Road SLAMS are primarily a result of PPL-Corette operations and resulting emissions.

With respect to industrial sources outside of the proposed NAA boundary, permitting programs will protect against potential impacts. Far below the NSR significance level of 40 tpy, DEQ would be prohibited from issuing a permit or allowing a de minimis change for a new or modified emitting unit unless an applicant demonstrates that it will not cause or contribute to a violation of any federal or state ambient air quality standard (ARM 17.8.745 and ARM 17.8.749). As shown over the history of the program, the Department has worked with applicants to further control or reduce emissions (and make those controls or reductions federally enforceable) so the appropriate demonstration can be made and the permit can be issued in compliance with ARM 17.8.749. In effect, the NSR provisions of offsetting and the Lowest Achievable Emissions Rate are being used at the minor source permitting level to minimize impacts upon nonattainment areas and to ensure that the ambient standards are protected.

Throughout this document Montana has demonstrated, and EPA's analysis appears to concur, that the predominant wind patterns are from the southwest and the sources upwind of the violating monitor are primarily impacting the monitor. Monitoring data from all the monitors in the area, not just the Coburn Road monitor, shows that the impacts are highly localized and do not support EPA's proposed designation of Nonattainment for the entire county. Given the nature of $SO_2$ emissions in the Billings/Laurel area as a localized, rather than a regional pollutant, the new $SO_2$ NAA should protect against localized, acute, short-term exposures and should be significantly smaller than the entire county of Yellowstone as suggested by EPA. The logical approach is to define the new NAA within the bounds of the monitors in the Billings area.

Montana's five factor analysis demonstrates that a smaller NAA is appropriate as opposed to EPA's default of the entirety of Yellowstone County. The proposed NAA includes the violating monitor (Coburn Road SLAMS) and the primary source impacting that monitor. Further, the proposed NAA excludes the monitors and associated areas demonstrating compliance with the 2010 1-hour $SO_2$ Standard.

Montana maintains its position that the $SO_2$ values for 2010 were influenced by an EPA OECA Consent Decree and are not representative of current or future ambient $SO_2$ concentrations in the Billings area. However the previous Five-Factor analysis is presented as justification for an appropriately sized NAA, should EPA maintain its position that 2010 monitoring is representative and should be included in the design value at Coburn Road.