

March 22, 2012

## **2011 Review**

### **WRAP SO<sub>2</sub> Milestone Tracking Process Audit**

The Sulfur dioxide (SO<sub>2</sub>) milestones and backstop trading program is a major component of the regional haze control plans developed by New Mexico, Utah, Wyoming, and Albuquerque/Bernalillo County under Section 309 of the Regional Haze Rule (Section 309 States). The program requires major industrial sources of SO<sub>2</sub> to submit an annual emissions inventory to their respective state or local air quality office. These inventories, in turn, are compiled by the Western Regional Air Partnership (WRAP) and analyzed to determine compliance with the regional SO<sub>2</sub> milestones.

The backstop trading program also calls for an independent audit to ensure that the state inventories are accurate and efficient. According to the Section 309 SIPs, the first audit shall occur during the year 2006 and shall review the data collected during the first two years of the program. This audit was completed by E.H. Pechan & Associates, Inc. and a final report was issued in October 2007 (Pechan Report No. 07.02.002/9456.002).

Subsequent audits are scheduled to occur in 2011 and 2016. The Section 309 States have reviewed the 2006 audit report, and have determined that the 2006 report is adequate satisfy the 2011 audit requirement. The rationale for this decision is described below.

### **Section 309 Regional Haze SIPs were updated in 2011**

The Section 309 states updated their SIPs in 2011 to incorporate new milestones. The inventory data for all major sources was updated from a 1998/1999 baseline to a 2006 baseline. In addition, more recent changes to individual sources due to new permits or federal consent decrees were included in the inventory that was the basis for the revised milestones. The 2006 audit report identified difficulties with making adjustments to utility data to address CEMs bias due to new flow rate measurements that were adopted in 1999. Because the baseline date has been changed to 2006 these adjustments are no longer required, simplifying the overall process. Arizona and Oregon are no longer participating in the program and the revised milestones reflect the smaller regional area.

### **Q/A Procedures have been effective**

The Section 309 States are following the Q/A procedures established in the SIP. These procedures are designed to identify sources with significant changes in emissions and then follow-up to determine why the changes occurred. Utility data are compared to the acid rain database. All milestone reports are made available for public comment and review. These procedures ensure the on-going accuracy of the yearly inventories.

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## **Current emissions are well below the milestones**

Regional emissions have continued to decrease, and many of the reductions that were estimated to occur near the end of the program have occurred early. Because emissions are significantly below the milestones, it is unlikely that emission inventory discrepancies would change the determination that the SO<sub>2</sub> milestones have been met, therefore making the audit results less critical.

## **Inventory procedures have not changed since 2006**

The 2006 audit did not find any significant problems, and the Section 309 States have not made significant changes to their inventory procedures. For the last two years the Section 309 States have worked cooperatively to compile the inventory rather than hiring a contractor to complete this work. The WRAP has continued to assist the states with the review and public comment process. Each Section 309 state has reviewed the description of their procedures in the 2006 report and any changes are noted below.

New Mexico: Although no changes have been made in the type of data we are collecting, the method of data collection has changed. We are now receiving EI data through a new web-based submittal tool, the Air Emissions Inventory Reporting (AEIR) tool. Facilities are still provided with a copy of their most recent EI report 90 days before the new report is due (April 1<sup>st</sup> of every year). EI data is still QA'd by NMED Air Quality staff, and if deficiencies are found, the submittal may be rejected and the facility required to update and resubmit. NM currently has about 145 Major Title V sources that are inventoried annually.

Utah: The inventory process is the same as was described in the 2006 audit report. The MS Excel Workbooks have been modified to update the baseline data and emission estimation methods to 2006. As noted in the 2010 milestone report, Colleen Delaney is the current contact for Utah.

Wyoming: No changes to the QA process have occurred since the final 2006 audit report was issued. There are currently 43 sources that are included in the milestone inventory. As noted in the 2010 milestone report, Brian Bohlmann is the current contact for Wyoming.

Albuquerque/Bernalillo County: No changes have been made to the inventory process.

## **Sections of the 2006 Audit Report are no longer relevant**

The 2006 Audit Report contains information regarding the inventory process in the states of Oregon and Arizona. These two states are no longer participating in the program, and

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this information is no longer relevant for the current milestone reports. The information regarding the inventory process in Oregon and Arizona has not been reviewed or updated. The 2006 Audit Report is intended to be used as a reference and has not been revised to reflect the 2010 inventory. This audit provided an independent review of the Section 309 State's inventory process that is still valid for the 2010 milestone report.

### **2016 Audit Report**

The next audit report is due in 2016. The 2018 milestone is the most critical year of the program, and it will be worthwhile to review inventory procedures prior to determining compliance in that critical year. The Section 309 States intend to conduct a new independent audit in 2016.

# **WRAP SO<sub>2</sub> MILESTONE TRACKING PROCESS AUDIT**

## **FINAL REPORT**

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## ACRONYMS AND ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
AZ	Arizona
CEMS	continuous emissions monitoring system
CLC	Chemical Lime Corporation
CO	carbon monoxide
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
EGU	electricity generating unit
EPA	United States Environmental Protection Agency
FCC	fluid catalytic cracking
FCCU	fluid catalytic cracking unit
NEI	National Emissions Inventory
NM	New Mexico
OR	Oregon
PQA	Perrin Quarles Associates, Inc.
PSEL	Plant Site Emission Limit
RATA	Relative Accuracy Test Audit
SCC	source classification code
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SRU	sulfur incinerator/recovery unit
tpy	tons per year
UDAQ	Utah Department of Air Quality
UT	Utah
WEB	Western Emissions Backstop
WRAP	Western Regional Air Partnership
WY	Wyoming

## INTRODUCTION

The sulfur dioxide (SO<sub>2</sub>) milestones and backstop trading program is a major component of the regional haze control plans developed by five western states under Section 309 of the federal regional haze rule [40 CFR 51.309]. The program requires major industrial sources of SO<sub>2</sub> to submit an annual emissions inventory to their respective state air quality offices. These inventories, in turn, are compiled by the Western Regional Air Partnership (WRAP) and analyzed to determine compliance with the regional SO<sub>2</sub> milestones.

The backstop trading program also calls for an independent audit to ensure that the state inventories and regional analyses are accurate and efficient. According to the program, the first audit shall occur during the year 2006 and shall review data collected during the first two years of the program. The primary focus of the audit is on the process that is used to compute the regional inventory from the data provided by each state and tribe, and the tracking of accumulated changes during the period between SIP revisions. The audit shall also review the accuracy and integrity of the regional reports that are used by the section 309 states to determine compliance with the milestones. The purpose of this report is to describe the audit of the milestone tracking program that was conducted by Pechan during the fall of 2006.

This audit is not intended to be a full review of each state's or local agency's (Arizona [AZ], City of Albuquerque, New Mexico [NM], Oregon [OR], Utah [UT], and Wyoming [WY]) process for compiling and reporting SO<sub>2</sub> emissions, but is a broad review of each state's inventory management and quality assurance systems (i.e., presence and exercise of systems to assure data quality and integrity).

This audit discusses the uncertainty of emission calculations, and whether this uncertainty is likely to affect the annual determination of whether the milestone is exceeded. It also identifies and recommends changes to emissions monitoring or calculation methods or data quality assurance systems. The audit also reviews and recommends any changes to improve the administrative process of collecting the annual emissions data at the state and tribal level, compiling a regional emission inventory, and making the annual determination of whether the Western Emissions Backstop (WEB) Trading program has been triggered.

This project was performed by Pechan staff participating in teleconferences with the state emission inventory staff, WRAP support staff, and the WRAP contractor responsible for preparing the 2003, 2004, and 2005 Regional SO<sub>2</sub> Emissions and Milestone Reports. Pechan's role was to observe the data collection process during the fourth quarter of 2006, interview each of the participating state and local agencies and primary contractor to understand and review the point source emission inventory development process, and review the first two program years of data. In addition, each state/local agency's emission inventory development processes were documented.

The sections that follow provide summaries of the interviews with the emission inventory staff of the section 309 states plus the City of Albuquerque (Bernalillo Co., NM). Following the state-specific analyses is a summary and recommendations section.

## ARIZONA - DISCUSSION WITH LATHA TOOPAL

The facilities in AZ are provided with electronic software by the State so that they can report their emissions (for SO<sub>2</sub> and other pollutants) using that software (which is *iSteps*). Facility data submittals are due to the AZ Department of Environmental Quality (ADEQ) by March 31st of each year for the preceding calendar year.

The State's quality control process includes reviewing the reporting performed by each facility, and includes a review of how the emissions were computed. Emissions estimation can either be continuous emissions monitoring system (CEMS), stack tests, mass balances on sulfur, or the United States Environmental Protection Agency (EPA) emission factors. CEMS are the emissions data source for electricity generating units (EGUs). The copper smelters in AZ provide monthly SO<sub>2</sub> emissions estimates to the ADEQ, which they review. Sources that have an SO<sub>2</sub> emissions performance standard are required to perform annual SO<sub>2</sub> emissions stack tests. For these sources, the stack test-based emission estimates are used to develop an emission factor/emission rate estimate that is then multiplied by the annual activity to estimate annual SO<sub>2</sub> emissions.

Independent validation and verification of SO<sub>2</sub> emission values is performed in a number of ways by ADEQ. One is by having an ADEQ observer at the stack tests that are performed to meet the performance standard requirement.

In their reporting to the WRAP contractor (Perrin Quarles Associates, Inc. [PQA]), ADEQ summarizes the information from their emission inventory system in the MS Excel file supplied by PQA. Then they calibrate any emission estimates that are plus or minus 20 percent from the emissions from the previous year. There is also confirmation from the facility that the SO<sub>2</sub> emission estimate is correct when this 20 percent threshold is exceeded.

ADEQ was asked by Pechan to provide the *as received* emission inventory data submittal for calendar year 2005 for the Chemical Lime Corporation (CLC) - Douglas plant. The purpose of this request was so that Pechan could provide an independent validation and verification of these data. The data submitted by CLC showed that all of the SO<sub>2</sub> emissions for this facility come from Kiln 5. The CLC submittal shows that SO<sub>2</sub> emissions for Kiln 5 are estimated by multiplying an emission factor by the annual fuel use to estimate annual SO<sub>2</sub> tons emitted. The SO<sub>2</sub> emission factor was 10.12 lbs per ton and the estimation method for this value is local emission factor. The annual activity was estimated as 149,295 tons of lime manufactured. The resulting annual SO<sub>2</sub> emission estimate (after conversion of pounds to tons) was 755.4 tons.

The source classification code (SCC) code for this lime kiln is 30501608, which is a calcining, coal-fired rotary kiln. The standard AP-42 SO<sub>2</sub> emission factor for this SCC is 5.4 lbs per ton. AP-42 States that due to differences in the sulfur content of the raw material and fuel and in process operations, a mass balance on sulfur may yield a more representative emission factor for a specific facility than the SO<sub>2</sub> emission factors presented in Tables 11.17-5 and 11.17. Therefore, the facility specific factor is acceptable.

It is recommended that there be documentation included in the milestone reporting of the specific basis for establishing a local emission factor, such as the one used here for Kiln 5. This documentation would include the year of the stack test. If a new stack test is performed each year to determine the local emission factor, that should be noted.

## **NEW MEXICO - DISCUSSION WITH HEATHER LANCOUR**

In December of each year, the NM Department of Environmental Protection (DEP) provides each facility with the baseline database that is needed for them to report their emissions for the calendar year just ended. Facilities have until April to submit their emission inventory data. Once received, the facility-supplied emissions data is subject to limited quality control review by the NM DEP staff. Quality control checks include completeness checks and overall reasonableness checks. No other verification or computerized quality control checks are performed on the emissions data. Staffing at NM DEP is one full-time equivalent per year for emission inventory activity (which is met via two part-time staff). NM has about 160 point sources in its inventory.

If sources submit revisions to their emission estimates at a later date, NM has no process for incorporating these data in its inventory. In fact, there is no way to revise a calendar year's emission inventory once it is exported from the system.

NM sources can use any valid emission estimation method for estimating SO<sub>2</sub> emissions, including material balance, emission factors, fuel sulfur content, etc. Sources may not be consistent in methods applied from year-to-year.

The facility that NM was asked to supply 2005 facility-supplied emissions data for is the Dynege-Monument Gas Plant. This facility was of interest because it indicated recently that its previous 2003 SO<sub>2</sub> emission estimate for the milestone report was incorrect, and should be revised. The plant owner in 2005 is now Targa Gas Resources.

The data submitted by the facility to the NM Environment Department indicate that there were three major SO<sub>2</sub> emission sources at this gas plant - the sulfur incinerator/recovery unit (SRU), and two emergency flares. The facility-supplied data indicate that the SRU emissions were estimated using a calculation method based on the manufacturer's specification. Actual SRU SO<sub>2</sub> emissions during 2005 were estimated to be 825.77 tons per year (tpy). No information is provided in the submittal about the specific emission factor used or the SRU throughput, so it is difficult to make judgments about the emission estimation methods.

The facility-estimated SO<sub>2</sub> emissions for the two emergency flares were 191.7 and 95.2 tpy, respectively. The emission estimation method for both flares is via a material balance.

Total facility estimated SO<sub>2</sub> emissions submitted by the facility and those in the 2005 milestone report match (1,114 tpy).

While the audit for this facility shows that the facility-supplied emissions match those in the milestone report, Pechan's review finds two potential concerns with the NM data collection

process. One is that there is not enough information provided by the facility to allow an independent reviewer to verify the emission estimation methods. The second is that this facility has provided information that indicates that the SO<sub>2</sub> emission estimates that were provided and included in the 2003 milestone report are incorrect and should be changed from 872 to 1,258 tpy of SO<sub>2</sub>. There appears to be no mechanism in the milestone process for correcting previously reported values after the reporting and review period is complete.

## **CITY OF ALBUQUERQUE, NEW MEXICO - DISCUSSION WITH STEPHANIE SUMMERS**

The City of Albuquerque, NM Air Quality Division requires facilities to submit emissions information for the National Emissions Inventory (NEI), which is required after the request for SO<sub>2</sub> emissions for the WRAP SO<sub>2</sub> milestone tracking program. The City usually reviews facility permit files (i.e., compliance reports for their permit, etc.) to see if the facility has already submitted SO<sub>2</sub> emissions. Normally, the facilities have not submitted their emissions, so the City will contact the sources directly to obtain their SO<sub>2</sub> emissions data. Currently, the City of Albuquerque has two sources subject to section 309, the City's Southside Water Reclamation Plant, and the GCC Rio Grande Portland Cement Plant.

Both facilities use their hours and appropriate emission factors to calculate their SO<sub>2</sub> emissions. The emission factors are either based on stack testing or applicable permitted emission rates. In 2004, the City actually calculated the emissions for the Water Reclamation Plant as the facility was not able to provide the information in time. The City used the hours that the facility reports on a quarterly basis and the permitted emission factor for SO<sub>2</sub>.

Once all SO<sub>2</sub> emissions data is obtained from the two sources, the City performs a quality assurance analysis on the emissions data. Air Division staff checks the emissions data reported by the facilities with previous year emission inventories to make sure that the reported numbers are not remarkably different from what the facilities reported the year before. Another check that the staff performs is to verify that the emissions reported by the facility to the NEI matches the estimates submitted to the SO<sub>2</sub> milestone tracking program. This check is performed after the SO<sub>2</sub> emissions data is reported for the milestone program.

With regards to the SO<sub>2</sub> milestone tracking program, PQA provides the City of Albuquerque with Excel file templates that are to be used by the City to submit annual SO<sub>2</sub> emissions information for all sources that emit more than 100 tons of SO<sub>2</sub> annually. These templates include the following information: source change report; enforcement milestone report; current year SO<sub>2</sub> emissions; and previous year SO<sub>2</sub> emissions. These reports are due to PQA yearly around the first of October. In 2004, the City of Albuquerque filled out the forms and submitted them to PQA, but they also have provided a letter from Mr. Isreal Tavarez, Air Division Manager. This letter stated that the City of Albuquerque would be submitting a letter annually to PQA stating the actual emissions from the two facilities. It also stated that that the City would not be filling out the annual emissions reports, because both facilities are under the 100 tpy mark on an annual basis.

The City of Albuquerque was asked by Pechan to provide the *as received* emission inventory data submittal for calendar year 2005 for the GCC Rio Grande Portland Cement Plant. The purpose of this request was so that Pechan could provide an independent validation and verification of these data. The data submittal shows that SO<sub>2</sub> emissions for this facility are estimated by multiplying an emission factor by the annual actual production to estimate annual SO<sub>2</sub> tons emitted. The SO<sub>2</sub> emission factor was 0.07 lbs of SO<sub>2</sub> per ton of clinker produced. The estimation method for this value is the average result of twelve emission tests on the facilities' kilns. The facility has performed several SO<sub>2</sub> stack tests over the last 5 years. The facility has spent a good deal of time and money in testing for SO<sub>2</sub> emissions because their first test showed what they felt were incorrect and extremely high SO<sub>2</sub> emissions. It was the feeling of the plant manager that this was due to an incorrect testing method, so the facility began to test much more frequently than necessary (every six months for awhile) and to hire a more experienced test contractor to ensure that they were not producing the amount of SO<sub>2</sub> that was assumed from the first test. The facility also replaced the coal being burned in the kiln with very low sulfur content.

The following are AP-42 SO<sub>2</sub> emission factors for Portland Cement Manufacturing:

Source Classification	SO <sub>2</sub> Emission Factor
Wet Process Kiln (SCC 30500706)	4.1
Long Dry Process Kiln (SCC 30500606)	4.9
Preheater Process Kiln (SCC 30500622)	0.27
Preheater/Precalciner Kiln (SCC 30500623)	0.54
Preheater/Precalciner Kiln w/spray tower (30500623)	0.50

The annual actual number of clinker produced was estimated to be 470,032 tons. The resulting annual SO<sub>2</sub> emission estimate (after conversion of pounds to tons) was 16.54 tons.

## OREGON - DISCUSSION WITH BRANDY ALBERTSON

The State of OR DEQ requires in its Title V operating permits that point sources submit an annual report to the State, which includes the source's emissions information. These annual reports are due to the state between February and April of the following year. For example, data for 2005 would be due between February and April of 2006. Currently OR DEQ has approximately 124 Title V sources.

The OR DEQ maintains a list of point source facilities that are currently emitting over 100 tons of SO<sub>2</sub>. After receiving all annual reports, the State performs a facility-wide emissions inventory to see what that total tons of SO<sub>2</sub> are for all the Title V permits. This check would alert them to any facilities not on the list that have emitted more than 100 tons of SO<sub>2</sub>. These facilities would then be added to the list.

When a point source submits emissions to OR DEQ, they are submitted at the sub-facility or emission unit level. Most sources use state and local emission factors, not monitoring data, in the calculation of their emissions. If the source does use monitoring data, they are required to include this information in the Title V permit. OR DEQ is able to obtain from each permit factors (i.e., emission factors, throughput) that go into the emissions calculation to ensure that

there are no mistakes in the source's calculations. If a permit inspector finds a mistake with a source's annual report, the OR DEQ would then notify the source of the mistake. Sometimes the source will catch the mistake and automatically send the revision to the State. Any necessary revisions to the emissions data typically occurs within 30 days of permit submittal to the State.

Another quality assurance check OR DEQ performs is in cases when emissions information in a permit appears peculiar, the State will compare the current data with the previous years permit data. If there is an issue, the State will go to the source or permit writer for clarification.

With regards to the SO<sub>2</sub> milestone tracking program, PQA provides OR DEQ with Excel file templates that are to be used by the State to submit annual SO<sub>2</sub> emissions information for all sources that emits more than 100 tons of SO<sub>2</sub> annually. These templates include the following information: source change report; enforcement milestone report; current year SO<sub>2</sub> emissions; and previous year SO<sub>2</sub> emissions. These reports are due to PQA yearly around the first of October.

The OR DEQ was asked by Pechan to provide the *as received* emission inventory data submittal for calendar year 2005 for the Portland General Electric Company – Boardman Plant. The purpose of this request was so that Pechan could provide an independent validation and verification of these data. The data submitted showed that most of the SO<sub>2</sub> emissions for this facility come from emissions unit/device ID "MB.DV." The submittal shows that SO<sub>2</sub> emissions for this unit are estimated by using CEMS data. The resulting annual SO<sub>2</sub> emission estimate was 12,017.4 tons. The submittal also shows emissions for emissions unit/device ID "AB.DV." The SO<sub>2</sub> emissions for this unit are estimated by multiplying an emission factor by the annual actual production to estimate annual SO<sub>2</sub> tons emitted. The SO<sub>2</sub> emission factor was 71 lbs per 1,000 gallons and the estimation method for this value is a Plant Site Emission Limit (PSEL) emission factor. The annual fuel use was estimated as 118,832 gallons. The resulting annual SO<sub>2</sub> emission estimate (after conversion of pounds to tons) was 4.2 tons. Total 2005 SO<sub>2</sub> emissions reported by this facility were 12,022 tons.

## UTAH - DISCUSSION WITH CAROL NIELSEN

In January of each year, the Utah Division of Air Quality (UDAQ) sends MS Excel workbooks to the large SO<sub>2</sub> sources in their state for use in reporting their emissions. The UT workbook includes the 1998 (for EGUs) and 1999 (for non-EGU point sources) data and emission estimation methods as a baseline for comparison with the current calendar year values. The workbook is structured so the source can input current activity data for individual equipment units, and emissions are automatically calculated using the base-year calculation methods. In addition, the source enters information about any changes in calculation methodology used in their current annual emissions inventory submittal.

Sources with EGUs in UT estimate their SO<sub>2</sub> emissions using CEM data. Non-EGU point sources estimate their SO<sub>2</sub> emissions using mass balance calculations, CEMs, EPA emission factors, or stack test emission factors. Periodic stack tests are required for equipment units that emit large amounts of SO<sub>2</sub>. UT reviews the emission estimates each year to ensure that emission changes from the base year to the current year are not paper increases (or decreases). Changes in

emission factors resulting from new stack test results are not considered paper increases/decreases.

UT supplied the 2005 calendar year emission estimates received from the Chevron-Salt Lake refinery. There are four major SO<sub>2</sub> emission sources at the refinery. These include the sulfur recovery unit, fuel gas combustion in boilers and process heaters, the fluid catalytic cracking unit, and flares. SO<sub>2</sub> emissions from all four of these key sources at the Chevron-Salt Lake refinery are present in the 2005 inventory submittal, although there appeared to be some incorrect SCC assignments. These SCC assignments do not affect the milestone report. Since they provide potentially misleading information to the state emission inventory, UDAQ and Chevron are discussing appropriate changes.

The Chevron sulfur plant SO<sub>2</sub> emissions are estimated based on CEMS measurements, which is measured at 993, 274 lbs per year, or 496.6 tpy. Excess SO<sub>2</sub> emissions from the sulfur plant of 0.9 tpy are added to the CEMS measured total for a sulfur plant total of 497.5 tpy. The sulfur plant emissions are assigned to SCC 30600904. It is recommended that the SCC be changed to 30103201 (or one in this series depending on the percentage removal).

Fuel gas and oil combustion emissions are primarily from the source labeled as Boilers #3 and 4. Fuel burning based emissions are less than 0.1 tpy from this source, but 383 tons of excess emissions are assigned. It was not clear from the original information provided why there would be excess SO<sub>2</sub> emissions from this boiler. Correspondence with Chevron via the UDAQ revealed that the amine plant/sulfur plant was not operating for a period during the fall of 2005, so a higher sulfur content fuel was being burned at these boilers.

Emissions from the Chevron fluid catalytic cracking (FCC) Regenerator/carbon monoxide (CO) Boiler are estimated based on an emission factor developed from a stack test (in lbs per hour) and the number of hours of operation during 2005. This calculation is 154.40 lbs per hour times 8688 hours per year converted from lbs to tons (this equals 671.71 tons). The stack test data for the FCC-CO Boiler was collected 1/21/2003. This unit is assigned a boiler SCC code in the emission inventory. It is recommended that this be changed to 30600201, which is the SCC for an FCC unit (FCCU).

Chevron emissions from the coker flare are estimated by an emission factor multiplied by the annual refinery throughput in barrels, plus excess emissions. Reported excess emissions for this source during 2005 are small, so the emissions are primarily based on an emission factor of 79.5 lb per 1000 barrels times 15,884 thousand barrels, which is 631.39 tons. The AP-42 SO<sub>2</sub> emission factor for vapor recovery and flaring is 26.9 lbs per 1,000 barrels refinery feed.

## WYOMING - DISCUSSION WITH DANIEL HERMAN

The State of WY DEQ sends out letters to all sources subject to section 309 in January requesting SO<sub>2</sub> emissions data for the previous year. Attached to the letters is an SO<sub>2</sub> emission reporting form for the source to fill out and return to the State. The source can either fill out a hard copy of the form and submit it back to the State, or they can fill out an electronic version of the form on WY DEQ's Air Quality Division website. These forms are due to the Regional Haze Program Inventory Program Manager by April 15. Currently WY DEQ has approximately 42 sources subject to section 309.

Once all SO<sub>2</sub> emissions data is received from the sources, WY DEQ performs an in-depth analysis of the data, which includes discussions with both environmental engineers and the sources themselves to better understand the methods used to calculate the emissions. For reporting year 2005, there were nine facilities that WY DEQ had to resend letters to requesting clarification on the emissions calculation methodologies. The facilities were given until August to reply.

Another quality assurance check that WY DEQ performs is a comparison of the SO<sub>2</sub> emissions data the source reported to the SO<sub>2</sub> milestone program and the SO<sub>2</sub> emissions data submitted for the source's Title V permit application.

When a source submits emissions to WY DEQ, they are submitted at the sub-facility or emission unit level. The source provides the methodology used to estimate emissions along with a clarification as to whether or not there was a change in the emissions calculation method from the base year method. The sources in Wyoming use a combination of either state and local emission factors or monitoring data, such as CEMS, in the calculation of their emissions. Testing data versus CEMS data raises questions regarding accuracy of the emissions. WY DEQ is in close contact with district engineers who perform recalculations of the emissions. This helps WY DEQ know exactly what the source emissions should be, and the State has a better understanding of how the emissions should be adjusted.

PQA provides WY DEQ with Excel file templates that are to be used by the State to submit annual SO<sub>2</sub> emissions information for all sources that emits more than 100 tpy of SO<sub>2</sub>. These templates include the following information: source change report; enforcement milestone report; current year SO<sub>2</sub> emissions; and, previous year SO<sub>2</sub> emissions. These reports are due to PQA yearly around the first of October. For the 2005 SO<sub>2</sub> milestone report, WY DEQ only submitted the source change report and the 2005 SO<sub>2</sub> emissions report to PQA. WY DEQ identifies all sources that will require a Part 75 Relative Accuracy Test Audit (RATA) adjustment, which is performed by PQA.

The WY DEQ was asked by Pechan to provide the *as received* emission inventory data submittal for calendar year 2005 for the Frontier Refinery-Cheyenne Plant. The purpose of this request was so that Pechan could provide an independent validation and verification of these data. The data submitted by Frontier showed that most of the SO<sub>2</sub> emissions for this facility came from two different sources, an FCCU Regenerator and a Coker Flare. The submittal shows that SO<sub>2</sub> emissions for the FCCU Regenerator are estimated by using CEMS data. The resulting annual

SO<sub>2</sub> emission estimate was 900.5 tons. The SO<sub>2</sub> emissions for the Coker Flare are estimated by using the permitted emission limit multiplied by the ratio of the actual unit feed rate to the permitted 10,000 bbl/d monthly average feed rate to estimate annual SO<sub>2</sub> tons emitted. The resulting annual SO<sub>2</sub> emission was 465.8 tons. WY DEQ determined that an adjustment to the Coker Flare emissions was required due to Frontier's change in emissions calculation method from the 1998 base year methodology. Using the 1998 methodology, the adjusted emissions were calculated using the average SO<sub>2</sub> test results (1179.8 lb/cycle) multiplied by the estimated number of Coker Unit cycles per year (811). The resulting adjusted annual SO<sub>2</sub> emission (after conversion of pounds to tons) for the Coker Flare was 472.4 tons.

The total 2005 SO<sub>2</sub> emissions reported by Frontier were 1,437.7 tons. This value was adjusted to 1,460.3 tons to account for the adjustment to the Coker Flare emissions. Generally, a source test would produce a more accurate source-specific emission rate than a permitted emission limit-based estimate. Presumably, this adjustment was made for consistency with baseline year reporting methods.

## **DISCUSSION WITH PERRIN QUARLES ASSOCIATES, INC.**

PQA is the contractor that was retained by the WGA to prepare the annual Regional SO<sub>2</sub> Emissions and Milestone Report. Pechan staff observed the 2005 calendar year data collection process and interviewed the PQA staff who worked on the 2005 milestone report. The process began with PQA distributing an MS Excel file that summarized the data needed for the 2005 report as well as the similar data that was submitted previously for calendar year 2004. Teleconferences were held with the state representatives and the process, needed data, and schedules were discussed, with opportunities for questions and comments.

PQA staff indicated that they perform limited quality control checks on submitted SO<sub>2</sub> emission estimates. EGU emission estimates are compared with EPA Clean Air Markets Division estimated values. PQA provides comments on any values that do not make sense. In addition, as a normal part of the milestone process, any SO<sub>2</sub> emission changes equal to or greater than 20 percent (higher or lower) are evaluated further to determine the reason for the change, which is noted in report tables.

PQA indicated that the RATA calculations for the applicable EGUs are performed by the states, not PQA, with the exception of WY, where PQA made these adjustments. For the states that provided the flow RATA adjustment values and associated annual emissions to PQA, there may be instances where the states relied on the sources to calculate the flow RATA related adjustment. The issue of how the flow method differences affect the SO<sub>2</sub> emission estimates for the facilities with CEMs is discussed further in the summary section.

PQA supplied Pechan with the data submitted by the individual states to them, and the data for the sources whose emissions are summarized in Table 1 were reviewed to see if the state submittals matched the data included in the milestone report. It was found that PQA successfully incorporated the state data submittals into the milestone report, including any revisions to the original data submittals when these occurred.

PQA indicated that the comment field in the milestone report emission tables is from information supplied by the states without revision by them. These comments seem to be accurate, with the exception of the comment on the Chemical Lime-Douglas plant, which says that during 2005 “the facility is in full operation.” It would be more accurate to say that Kiln 5 was in full operation during 2005. There are two other kilns at the Douglas plant that are inactive.

**Table 1. Facility-Specific SO<sub>2</sub> Emissions Review Summary**

State/Local Agency	Facility Name	2005 Actual SO <sub>2</sub> tons	2004 Actual SO <sub>2</sub> tons	2003 Actual SO <sub>2</sub> tons
AZ	Chemical Lime Corporation – Douglas	755	126	0
NM	Targa Gas Resources – Monument Gas	1,114	2,416	872 *
City of Albuquerque	Rio Grande Portland Cement	17	17	22
OR	Portland General Electric Company – Boardman	12,022	12,392	13,121
UT	Chevron – Salt Lake Refinery	2,201	1,365	1,191
WY	Frontier Refinery – Cheyenne	1,460	1,565	1,657

\* Targa Gas Resources has indicated that their 2003 calendar year SO<sub>2</sub> emissions for the Monument Gas plant were 1,258 tpy.

The annual emission reports for each state include proposed adjustments to ensure consistent comparison of emissions to the milestones. The adjustments account for any differences in emissions that result from changes in the monitoring or calculation methodology used in the year of interest compared with the baseline year method. The State Implementation Plans (SIPs) describe three specific methods for adjusting Part 75 Acid Rain Program EGU emissions due to changes in quality assurance procedures for the flow monitor component of SO<sub>2</sub> CEMS. These changes involve the use of new flow reference methods in the RATA (2F, 2G, 2H, 2J), which were not available in the 1999 baseline year. The flow methods and RATA adjustments provide consistency with the milestone 1999 EGU baseline.

It appears that the rule adjustment methods were written assuming that the reference method would only change once. Two of the adjustment methods require a full year of data quality assured by the new method before the adjustment is made. However, there are instances where sources have made further changes from year-to-year, and this has complicated the adjustments when data in a single year are quality assured by that year’s RATA with one flow method, and the previous year’s RATA with a different flow method. This has resulted in changing adjustment factors, and years when no adjustment was made due to data quality assured by two different methods. However, the adjustments do achieve their intended purpose by providing a conservative SO<sub>2</sub> emissions estimate that does not allow measurement changes for purposes of meeting the milestone targets.

Table 2 compares reported and adjusted SO<sub>2</sub> emission values for Part 75 units and shows that these adjustments produce higher, not lower, SO<sub>2</sub> emission estimates. The 2003 to 2005 adjustments produce 5 to 9 percent higher SO<sub>2</sub> emissions for Part 75 units than had the adjustments not been made. Therefore, these flow RATA adjustments produce conservative estimates of SO<sub>2</sub> emissions reported to the program.

**Table 2. Part 75 Unit Reported and Adjusted SO<sub>2</sub> Emissions (tpy)**

Year	Reported	Adjusted	Adjustment
2003	209,280	219,920	10,640 (+5% of reported)
2004	202,312	218,447	16,135 (+8% of reported)
2005	197,806	215,425	17,619 (+9% of reported)

Source: Provided by PQA.

## SUMMARY

The annual emission reports for each state include proposed adjustments to ensure consistent comparison of emissions to the milestones. The adjustments account for any differences in emissions that result from changes in the monitoring or calculation methodology used in the year of interest compared with the baseline year method. The State Implementation Plans (SIPs) describe three specific methods for adjusting Part 75 Acid Rain Program EGU emissions due to changes in quality assurance procedures for the flow monitor component of SO<sub>2</sub> CEMS. These flow RATA adjustments add some complexity to the emissions estimation process, but they do produce conservative estimates of SO<sub>2</sub> emissions reported to the program.

It is recommended that there be documentation included in the milestone reporting of the specific basis for establishing a local SO<sub>2</sub> emission factor when it is developed from a stack test or any other method. This documentation would include the year of the stack test or other parameter details if any other method is used.

There needs to be a formal mechanism in the emissions tracking process that allows revisions to be made to previous year's reports under certain circumstances where sources supply revised emissions estimates. Such a mechanism does not currently exist. Criteria should be developed to determine when such revisions should be made/allowed.

Section 309 states that do not have the resources to perform extensive quality control reviews of the emissions data submitted by the point sources in their states could be assisted by either having additional resources made available to them for performing such tasks, or by some information sharing from other states that may have established routine computerized procedures for such checking. The computerized quality control programs available from EPA focus on ensuring that data are formatted correctly for input to its data system, so they have limited usefulness for the milestone program, which is concerned about emission quantities.

The methods used by PQA to collect annual SO<sub>2</sub> emission estimates from the states and the City of Albuquerque are sound and provide an accurate assessment of how well the Section 309 states are doing relative to the milestones.

Any uncertainties in current SO<sub>2</sub> emission estimation methods are small and do not compromise the finding that SO<sub>2</sub> emissions within the region are well below the milestone established for the 2003-2005 period.

## APPENDIX A. WRAP SO<sub>2</sub> REPORT AUDIT - STATE CONTACTS

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