

**Denver Metropolitan Area and North Front Range  
8-Hour Ozone  
State Implementation Plan**

Technical Support Document

Determination of Rule Effectiveness  
For  
Proposed Pneumatic Controller and Condensate Tank Regulation



**DRAFT**

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*DRAFT - Denver Metro Area/North Front Range 8-hour Ozone SIP  
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# 1. Pneumatic Controller Regulation Rule Effectiveness Determination

## 1.1. Background

Many types of process control devices can be used to operate valves that regulate pressure, flow, temperature, and liquid levels. These devices can be operated pneumatically, electrically, or mechanically. A pneumatic device is an instrument that is actuated by gas. Most of the devices used by the natural gas industry are pneumatically operated. Although instrument air is commonly used to power pneumatic devices at gas processing facilities, where electricity is readily available and can be used to compress air, the majority of natural gas industry pneumatic devices are powered by natural gas.

As part of normal operation, most pneumatic devices emit, or “bleed”, gas to the atmosphere, either continuously or intermittently. Pneumatic devices generally consist of a controller and a valve. Bleed rates are associated with the controller. Gas is vented to atmosphere during actuation when valves open and/or close; however, vent rates are not significant and are the same whether a high-bleed or low-bleed controller is used. The proposed regulation addresses bleed rates from controllers that are actuated by natural gas.

## 1.2. Definition of Rule Effectiveness

Rule Effectiveness (RE) is a term that describes a method to account for the reality that not all facilities covered by a rule are in compliance with the rule 100% of the time. Rule effectiveness reflects the actual ability of a regulatory program to achieve the emission reductions required by regulation. The concept of applying rule effectiveness in a State Implementation Plan (SIP) emission inventory has evolved from the observation that regulatory programs (and associated compliance rates) may be less than 100 percent effective for some source categories.

The Air Pollution Control Division (Division) reviewed the latest Environmental Protection Agency (EPA) guidance (EPA-454/R-05-001), Appendix B “Revised Rule Effectiveness”, August 2005, for Non-Point Sources) to determine an appropriate RE value. The guidance provides emission inventory preparers with a listing of factors that are most likely to affect RE.

## 1.3. Discussion

The Division determined that the required factors for Range 2, with a corresponding RE of 70-85%, have been satisfied as discussed below:

- **Sources in Compliance-** In June 2008 the Division prepared and sent, via Section 111 letters, requests to the oil and gas industry in the Denver Metro Area and North Front Range (DMA/NFR) non-attainment area (NAA). (Letters were mailed in accordance with the Division’s authority found in Air Quality Control Commission (AQCC) Common Provision Regulation Section II.C. and Section 25-7-111(2)(i),

C.R.S. This is an official method of gathering information from industry.) The Section 111 letters included requests for submittal of information related to the presence of high- and low-bleed devices (as described above) and indicated that affected sources must either report these controllers to the Division (via Air Pollution Emission Notices or a permit application, if such thresholds were reached) or replace the controllers with low-bleed devices. Industry reported that all but approximately 85 controllers had been replaced or would be replaced by November 2008. At a minimum, industry had committed to converting approximately 95 percent of high-bleed devices to low-bleed by November 2008.

- **Compliance Certification** – As described above, affected companies certified their retrofitting of pneumatic controllers via their response to the Division’s Section 111 letters. These signed and dated response letters are on file with the Division.
- **Compliance Assistance** – The Division, with industry and the Regional Air Quality Council (RAQC), hosted a presentation on pneumatic controllers in June 2008. This presentation allowed industry to learn the simplicity of retrofitting devices. EPA GasSTAR information was provided as an additional resource. The Division provided one-on-one customer service to a number of operators who requested additional information and guidance. These consultations allowed the Division an opportunity to clarify technical aspects of pneumatic controllers and to provide an example emission calculation.

A RE value of 83 percent was used by the Division in recent SIP modeling, although it may have been appropriate to use a higher value. Many companies have already begun implementing the proposed regulation voluntarily, as evidenced from responses to a Section 111 information request letter as described above. Once the proposed regulation is implemented, companies would be required to obtain permission from the Division to continue using existing high-bleed pneumatic devices (e.g., safety exemptions), or to install new ones. Therefore, it is anticipated that the conversion percentage may rise above 95 percent.

The Division has determined that the required factors for Range 2, with a RE of 70-85%, for pneumatic controllers have been satisfied.

## **2. Condensate Tank Regulation Rule Effectiveness Determination**

In the ozone non-attainment area, Regulation 7 requires a condensate tank VOC emission control program during the 23 week ozone season (May 1 – Sep 30) that is averaged over the whole system of tank batteries except for small operators with emissions under 30 tpy. The system-wide control program has been implemented over three years to accommodate availability and installation of control devices on thousands of tank batteries. In the first year (2005), tank emissions were required to be reduced by 37.5% system-wide; that figure was increased to 47.5% in 2006 and 75% in 2007. Producers are required to report compliance with the system-wide control requirements on a weekly basis during the ozone season.

In the Early Action Compact (EAC), the Regulation 7 condensate tank RE of 83% was established by the AQCC at a public hearing in December 2006. RE is a term that describes a method to account for the reality that not all facilities covered by a rule are in compliance with the rule 100% of the time. For the development of the 2008 DMA/NFR Ozone SIP the Division reevaluated RE based on a review of system-wide reports from the producers. Since each year of the system-wide implementation period had an increased level of stringency in emission controls, the Division limited the reconsideration of condensate tank RE to the 2007 ozone season. The 2007 data provide an appropriate and representative sample of compliance rates, which should best reflect the fully implemented 75% control specified in the existing rules for 2010 attainment date.

### **2.1. Compliance Issues Which Inform Rule Effectiveness**

As part of the development of revisions to Regulation No. 7 emission controls for condensate storage tanks, the Division reviewed the application of RE.

As part of this rulemaking, the Division has reviewed the 2005, 2006 and 2007 summer ozone season compliance histories of operators in the NAA. Such a review has allowed the Division to determine operators' rate of compliance with meeting Regulation No 7 requirements. In essence, a number of large and small companies continue to have challenges with compliance (e.g., failure to meet 75% system-wide control requirements). In addition, the Division has weighted individual companies' Regulation No. 7 compliance histories against their VOC contribution in the NAA (as a function of total condensate tanks emissions). Such an effort has allowed the Division to gauge how operators in the NAA essentially impact VOC emissions.

The Division reviewed submittals from the 25 companies that were subject to Regulation No 7 during the 2005 ozone season. Of these 25 companies, 17 were out of compliance with the season's 37.5% control requirement. Three enforcement cases were opened in calendar year 2005 to resolve compliance issues for Regulation No 7.

For the 2006 ozone season, 16 out of 26 companies subject to Regulation No 7 had at least one day of non-compliance with the 47.5% control requirement. There were 12 companies

with an average percent control less than the 47.5% requirement for the entire ozone season.

The Division contracted with Weld County to perform inspections of 214 tank batteries in the 8-hour ozone attainment area during the 2006 ozone season. Of the 214 inspections, 75 flares were out of service. Of these 75 cases, the inspector observed flare outages which were not reported on the Regulation No 7 emission spreadsheet submittals in 31 cases. ( $31 / 214 = 14.5\%$  spreadsheet noncompliance; therefore, compliance rate of 85.5%; another data point that supports 83% RE).

## **2.2. Use of EPA RE Guidance for Condensate Tanks**

The Division reviewed the latest EPA guidance (EPA-454/R-05-001), Appendix B “Revised Rule Effectiveness”, August 2005) to determine a RE value. The guidance provides emission inventory preparers with a listing of factors that are most likely to affect RE.

The Division determined that the required factors for Range 3, with a corresponding RE of 81-86% have been satisfied as discussed below:

- **Monitoring:** The Division requires sources to monitor control equipment downtime, production and emissions from each tank battery. These records are to be reported to the Division each year.
- **Compliance History:** The facilities have met the compliance schedule, and reports have been filed within the required timeframe.
- **Inspections:** Unannounced inspections are performed at the facilities. Such inspections include the review of the process and control equipment.
- **Control Device Operation and Maintenance:** Operators are required to monitor control equipment on a weekly basis.

Thus, these analyses demonstrate that a RE value of 83% is appropriate to apply to condensate tanks in the NAA.

The Division has three years’ experience with the system-wide approach. Overall compliance has improved over the past three years. However, on-site inspections and reported information indicate a compliance disparity between large producers and small producers. Large producers, which predominate the number of tanks and their associated emissions, have reported fairly solid compliance with the system-wide control requirements. In fact, VOC-weighted (and hence company-weighted) compliance overall shows an approximately 91% compliance throughout the system-wide approach. Since these are active enforcement cases, details are not included in this document. Conversely, smaller producers have generally had poor reported compliance with the requirements. Future inspections by Division staff and local agencies will better bolster our understanding of these suspect compliance rates.

### 3. References

1. U.S. EPA, 2005. “*Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations - Appendix B: Revised Rule Effectiveness.*” EPA-454/R-05-001. Emissions Inventory Group Emissions, Monitoring and Analysis Division. Office of Air Quality Planning and Standards. U.S. Environmental Protection Agency. Research Triangle Park, NC. August 2005