Condensate Tanks

Program Description

This strategy to reduce ambient ozone levels by reducing volatile organic compounds (VOCs) within the non-attainment area (NAA) involves modifying Colorado Air Quality Control Commission Regulation No. 3 (Reg. 3) and No. 7 (Reg. 7) by one or more of the following options:

- Increase system-wide VOC emission control requirement for the NAA
- Replace system-wide control requirements with emission threshold control requirements
- Increase VOC emission control requirement of tanks with uncontrolled actual emissions equal to or greater than 20 tons per year (tpy)
- Eliminate Air Pollution Emission Notice (APEN) sized-based exemption

Options for Further Consideration

VOC emissions from regulated and exempt condensate tanks within the NAA were 111 and 15 tons per day (tpd) for the 2006 baseline, respectively. Emissions have been projected to be 110 and 19 tpd for the 2010 baseline, respectively.[1,2] If regulated and exempt condensate tanks are combined into one source category, it represents 71 percent of the total VOC emissions from oil and gas sources in the NAA for 2006 and 68 percent for 2010. Therefore, emission reductions related to this source category have the potential to be significant. As a result, this strategy has been developed since the draft version was presented at the February 26, 2008 Regional Air Quality Council (RAQC) stakeholder meeting. However, not all options within this strategy have been further developed. This paper presents information for the options that have been further developed.

All stakeholder comments received to date and responses, if ready, are available in a separate document that will be accessible to stakeholders.

Increase System-wide VOC Emission Reduction Requirement – NAA

Reg. 7, XII.A.2.c and XII.A.2.d requires that owners or operators of condensate storage tanks located in the NAA that are required to file APENs must reduce emissions system-wide by 75 percent on a weekly basis from uncontrolled actual emissions during the ozone season, which is the period of May 1 through September 30 of each year beginning in 2007 until 2011, after which emissions must be reduced by 78 percent during the ozone season. These emission reductions are on a system-wide basis, meaning that in the NAA, each owner or operator must achieve an average control of 75 percent for all of their tanks on a weekly basis. This generally translates to larger tanks being controlled with a flare, or to a lesser extent a vapor recovery unit (VRU), both having a control efficiency of approximately 95 percent while smaller tanks are not controlled. The APCD is considering modifying Reg. 7 so that these owners and operators must reduce uncontrolled actual emissions by approximately 95 percent during the ozone season beginning May 1, 2009 and being phased in through May 1, 2010. The final control percentage would be determined during the 2008 ozone stakeholder process if this option is selected.

Reg. 7, XII.A.2.h requires that these same owners and operators must reduce uncontrolled actual emissions by 70 percent on a weekly basis during the ozone off-season, which is the period of January 1 through April 30 and October 1 through December 31, each year beginning in 2008. The APCD is considering modifying Reg. 7 so that these owners and operators must reduce uncontrolled actual emissions by more than 70 percent during the ozone off-season beginning October 1, 2009. The final control percentage would be determined during the 2008 ozone stakeholder process if this option is selected.

Replace System-wide Control Requirements with Emission Threshold Control Requirements

Companies that have multiple condensate tank systems within the NAA must control VOC emissions from their tank system at 75 percent, on average. Generally, flares are used as control devices on larger tanks. Flares and VRUs are credited with 95 percent control for compliance record keeping purposes. A

company tracks each tank battery in their system and its individual control efficiency (typically either 95 or 0 percent), and then calculates the system-wide average control efficiency taking into account both controlled and uncontrolled tanks. Replacing the current system-wide strategy with an individual tank strategy would result in every condensate tank located within the NAA that emits at least 5 tpy VOC (the 5 tpy threshold assumes that the current exemption is in place) being controlled by at least 95 percent. The emission threshold would be calculated using a 12-month rolling total calculated on the first day of each month using data from the previous 12 months.

If this option is implemented, it would have a similar effect on emissions as implementing the first option discussed in this strategy if that option resulted in a control efficiency of 95 percent. This option would simplify the intense system-wide control program recordkeeping and reporting process and eliminate the ambiguity of where controls are located.

Eliminate Size-Based Exemption

Reg. 3, Part A, II.D.1.eeee categorically exempts condensate tanks with production rates less than 730 barrels per year (bbl/yr) from APEN emission reporting requirements. If the exemption was removed, an APEN would need to be filed for any condensate storage tank or collection of tanks that are manifolded together unless the tank(s) is exempt under Reg. 3, II.D.1.a, which provides APEN exemptions for emission points in nonattainment areas having uncontrolled actual emissions of any criteria pollutant (VOC) of less than 1 tpy, or 2 tpy in attainment areas. A condensate storage tank production rate of 730 barrels per year corresponds to approximately 5 tpy VOC emissions.

Air Quality

VOC emissions from regulated and exempt condensate tanks within the NAA were 111 tpd and 15 tpd, respectively, for the 2006 baseline. Emissions have been projected to be 110 tpd and 19 tpd, respectively, for the 2010 baseline, assuming that regulatory and industry policy and practices do not change.[1,2] VOC emissions may be reduced by 12 to 49 tpd if the first option is adopted, depending upon the level emission control requirement (Increase System-wide VOC Emission Reduction Requirement). These reductions correlate to control requirements of 80 and 95 percent, respectively. VOC emissions may be reduced by 43 tpd the second option is adopted (Replace System-wide Control Requirements with Emission Threshold Control Requirements). VOC emissions may be reduced by 21 tpd if the fourth option is adopted (Eliminate Size-Based Exemption).

These emission reduction values are based on the following assumptions:

- Rule effectiveness (RE) of 83 percent used to calculate 2010 baseline emissions
- Ratio of tanks (regulated to exempt) is the same in 2006 and 2010

Health and Welfare Benefits

While health benefits are not quantified here, it is understood that reducing direct emissions of VOCs can reduce ozone and some air toxics. This will reduce the incidence of human health impacts caused by ozone such as pulmonary, cardiovascular, respiratory, and nervous system disease. Because elevated ozone also damages crops, forests, and other natural plant life, all would benefit if emissions are reduced.

Program Costs

The most common way to control emissions from condensate tanks is to use a flare. The annualized cost per flare is $7,189, based on the following assumptions:

- 15 year amortization
- Flare capital cost (30” diameter, 1 MMBtu/hr rating) of $9,100
- Installation cost of $1,500
- Annual operating cost (fuel) of $2,000
- Income not spent on flare, installation, and operating costs could be invested with a return of 10 percent

Therefore, the cost to control a condensate tank that has VOC emissions of 2 tpy is $3,595 per ton VOC emissions. The cost per tank decreases as its throughput, and subsequently its VOC emissions, increases. For example, the cost for a 5 tpy tank is $1,438 per ton VOC emissions and the cost for a 20 tpy tank is $359 per ton VOC emissions. Specific costs associated with the options in this strategy will be determined.

RACT Considerations

In conjunction with the first and second option presented in this strategy, the Colorado Air Pollution Control Division (APCD) is proposing to make Reasonably Available Control Technology (RACT) consistent between Reg. 3 and Reg. 7 to address the potential conflict between the regulations on when RACT is triggered. Reg. 3 triggers RACT at permit levels for new sources, whereas Reg. 7 triggers RACT by source category or at 100 tpy (as described in Section II.c.1.a(1)). This could be accomplished by removing Reg. 7 language regarding RACT and other applicable exemptions and instead relying upon existing Reg. 3 language or by making Reg. 7 language consistent with Reg. 3 language. General concepts associated with the presumptive RACT proposal are:

- The regulation should be modified to establish that the APCD will require RACT for all new and modified oil and gas sources
- Wyoming Best Available Technology (BAT) determinations can be used as an example, which will reduce APCD resource impacts to initiate the program. Over time, the APCD would re-evaluate RACT determinations to ensure requirements utilize current control technology. The goal may be a review of each technology and update as needed. All RACT policies would be available on the Web, which would promote consistency.
- RACT determinations can be identified by compiling and maintaining a list in a guidance document, rather than in regulation, so that they can be modified more easily to keep with current technology.
- The APCD may consider developing general permits that would include the relevant RACT determination to streamline the permitting process.
- RACT applies to new and modified sources. The APCD may need to address existing sources to ensure ozone is reduced to National Ambient Air Quality Standards (NAAQS).

Implementation/Administration

This strategy has the potential to significantly increase the number of regulated sources, and has reporting, permitting, and/or compliance assurance impacts to the APCD. If the fourth option (Eliminate Size-Based Exemption) is implemented, APEN filings would increase significantly, which will require additional APCD processing, permitting, inspection, and enforcement resources. If the second option (Replace System-wide Control Requirements with Individual Tank Control Requirements) is implemented, it would not require as many additional APCD resources as implementing the first option (Increase System-Wide VOC Emission Control Requirement).

References

[1] ENVIRON, Buys and Associates, and IPAMS, *Development of Baseline 2006 Emissions from Oil and Gas Activity in the Denver-Julesburg Basin*, February 7, 2008
[2] ENVIRON, Buys and Associates, and IPAMS, *Development of Baseline 2006 Emissions from Oil and Gas Activity in the Denver-Julesburg Basin*, March, 2008

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