SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

FINAL STAFF REPORT

Update to Rule 2201 Best Available Control Technology (BACT) Cost Effectiveness Thresholds

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Prepared by: Ben Ellenberger, Air Quality Engineer
Leonard Scandura, Supervising Air Quality Engineer

Reviewed by: David Warner, Director of Permit Services
Carlos Garcia, Senior Air Quality Engineer

I. Summary

The current Rule 2201 Best Available Control Technology (BACT) cost effectiveness thresholds were incorporated into the San Joaquin Valley Air Pollution Control District's (SJVAPCD) BACT policy upon formation of the SJVAPCD in 1991. The cost effectiveness thresholds used by the SJVAPCD have not been updated since that time.

In a November 2005 report on their 2003 program review of the SJVAPCD, the California Air Resources Board (CARB) indicated that the SJVAPCD's BACT cost effectiveness thresholds were substantially lower than other Districts with similar or better air quality status and suggested that the cost effectiveness thresholds be increased.

Although SJVAPCD staff has not seen differences in the results of BACT analyses when compared to other air Districts, in our 2006 response to the CARB program review we made a commitment to CARB to form a workgroup of SJVAPCD staff, industry representatives, environmental and community group representatives to investigate CARB's concerns and recommend SJVAPCD action, if appropriate, to the Air Pollution Control Officer.

Members of the workgroup included District staff, industry representatives Daryl Gunderson of Aera Energy, Chris Savage of E & J Gallo, and Roger Isom of California Cotton Ginners and Growers Association; and environmental and community group representatives Sarah Jackson of Earthjustice, Carolina Simunovic of Fresno Metro Ministry, and Caroline Farrell of Center on Race, Poverty and the Environment. CARB and EPA staff were invited to participate in this process; each provided verbal or written comments.

The proposed updates are the result of the workgroup's collaborative effort, careful discussion, and detailed analysis over several months in 2007. The investigations of this group confirmed overall impressions that there are no significant differences in the results of SJVAPCD's past BACT analyses when compared to other Districts. One conclusion was that the SJVAPCD's cost effectiveness thresholds are not directly comparable to those of other Districts because the method in which the calculated emission reduction is determined is inherently different.

By way of explanation, the SJVAPCD's comparatively low cost effectiveness thresholds are offset by the method in which the SJVAPCD calculates the emission reduction due to installation of technologically feasible control equipment. The SJVAPCD's current methodology calculates the emission reduction due to installing technologically feasible control equipment on equipment available on a nationwide basis. Equipment available on a nationwide basis typically has higher emissions than that allowed by SJVAPCD rules.

As a result, the calculated emission reduction due to installing technologically feasible control equipment is relatively large, making the cost effectiveness of such control equipment relatively low, using the standard cost effectiveness equation:

$$\text{cost effectiveness (\$/ton)} = \frac{\text{annualized cost of tech feasible control (\$/year)}}{\text{calculated emission reduction (ton/year)}}$$

The SJVAPCD's current relatively low cost effectiveness thresholds are appropriate given the typically large emission reductions determined using the SJVAPCD's current emission reduction calculation methodology.

Other Districts with higher cost effectiveness thresholds determine the calculated emission reduction due to installing technologically feasible control equipment on equipment that is in compliance with the District's rules. Such equipment typically has lower emissions than that available on a nationwide basis. In those cases, the calculated emission reduction is low, making the cost effectiveness high. In such cases, higher cost effectiveness thresholds are appropriate.

An examination of the BACT guidelines of the SJVAPCD and other Districts revealed that the SJVAPCD's BACT requirements are as stringent or more stringent that those of other California Districts. As such, the SJVAPCD's current thresholds and emission reduction calculation methodology do not result in less stringent BACT requirements.

To address CARB's concern and to eliminate the appearance of inconsistency when compared to other Districts, the workgroup has generally concluded that the cost effectiveness thresholds and emission reduction calculation methodology should be updated to make the SJVAPCD's cost effectiveness thresholds and emission reduction calculation methodology consistent with that of other Districts.

These two changes taken together should not have a significant effect on the outcome of the majority of cost effectiveness analyses performed by the SJVAPCD.

II. Current Cost Effectiveness Thresholds And Emission Reduction Calculation Methodology

Rule 2201 section 3.9 defines BACT as the most stringent emission limitation or control technology that is:

- Achieved in practice for such category and class of source,
- Required by an EPA approved State Implementation Plan, i.e. required by a Rule that has been approved by EPA,
- Required by a Federal New Source Performance Standard (NSPS), or
- Is found to be both technologically feasible and cost effective for such class or category of sources or for a specific source.

The Rule 2201 definition of BACT is not proposed to be changed.

Please note that if an emission limit or control technology is achieved in practice for a category and class of source, required by an EPA approved SIP, or is required by a Federal NSPS such control is required regardless of cost. As such, the cost effectiveness analysis process only includes those technologically feasible control technologies that are not achieved in practice for a category and class of source, required by an SIP, or required by an NSPS requirement.

The cost effectiveness thresholds currently used by the SJVAPCD to determine if a technologically feasible control technology is cost effective are as follows:

Pollutant	Cost effectiveness ($/ton)
NO_x	9,700
CO	300
VOC	5,000
SO_x	3,900
PM_{10}	5,700

In determining if a technologically feasible control technique is cost effective, the cost effectiveness of a particular control technology is compared to the cost effectiveness thresholds for a given pollutant.

For example, if the cost effectiveness for NOx control technique A is $6,000/ton, such a control technique is determined to be cost effective because its cost effectiveness ($6,000/ton) is less than the SJVAPCD's cost effectiveness threshold ($9,700/ton). As a result, NOx control technique A would be required.

Alternatively, if the cost effectiveness for NOx control technique B is $30,000/ton, such a control technique is determined not to be cost effective because its cost effectiveness ($30,000/ton) is greater than the SJVAPCD's cost effectiveness threshold ($9,700/ton). As a result, NOx control technique B would not be required.

Currently, to determine the cost effectiveness of a particular control technique, the annual costs of the control (annualized capital costs plus annual operating costs) are divided by the calculated emission reduction due to that particular control technique. The emissions reduction is calculated as the difference between emissions from equipment available on a nationwide basis and emissions from such equipment equipped with technologically feasible control.

Cost effectiveness ($/ton) =

$$\frac{\text{Annual cost ($/year)}}{\text{Emissions (available nationwide) – Emissions (w/ tech feas BACT) (ton/year)}}$$

Emissions from equipment used nationwide can be higher than SJVAPCD prohibitory rules allow for existing equipment. As a result the calculated emission reduction can be overstated, i.e. the calculated emission reduction can be larger than the actual emissions reduced due to installing technologically feasible control on equipment that must otherwise meet SJVAPCD prohibitory rule requirements.

III. Survey of other Districts, CARB, and EPA

The workgroup surveyed the South Coast Air Quality Management District (SCAQMD), Bay Area Air Quality Management District (BAAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), Yolo-Solano Air Quality Management District (YSAQMD), San Diego County Air Pollution Control District (SDAPCD), California Air Resources Board (CARB), and the US Environmental Protection Agency (EPA) for the following:

- BACT cost effectiveness thresholds
- Methodology for calculating the "emission reduction" in cost effectiveness analyses

Survey of cost effectiveness thresholds:

Summary of BACT Cost Effectiveness Thresholds ($/ton)							
	SCAQMD[1]	BAAQMD	SMAQMD	YSAQMD	SDAPCD[2]	CARB[2]	EPA[2]
NO_x	19,100	17,500	24,500	24,500	18,000	N/A	N/A
CO	400	N/A	N/A	300	N/A	N/A	N/A
VOC	20,200	17,500	17,500	17,500	10,200	N/A	N/A
SO_x	10,100	18,300	18,300	3,900	N/A	N/A	N/A
PM_{10}	4,500	5,300	11,400	5,700	N/A	N/A	N/A

Notes:

[1]The SCAQMD's method of amortizing control equipment costs is now inherently different from the methods used by the other Districts. The SCAQMD method tends to result in lower amortized control equipment costs (and therefore lower cost effectiveness thresholds). Because the SCAQMD amortization method is inherently different than that used by other Districts, it will not be considered further.

[2]SDPACD does not have thresholds for CO, SOx, and PM10. CARB and EPA do not have defined thresholds for any air contaminant.

The results of the survey indicate that all other Districts have cost effectiveness thresholds much greater than the SJVAPCD for each affected pollutant, except CO.

The average of other District's cost effectiveness thresholds (except SCAQMD) and the % difference from the SJVAPCD's existing levels are as follows:

Average cost effectiveness thresholds ($/ton)				
NOx	CO	VOC	SOx	PM10
21,100	300	15,700	13,500	7,500
117%	0%	214%	246%	32%

The highest cost effectiveness thresholds of other surveyed Districts and the % difference from the SJVAPCD's existing levels are as follows:

Highest cost effectiveness thresholds ($/ton)				
NOx	CO	VOC	SOx	PM10
24,500	300	17,500	18,300	11,400
150%	0%	250%	370%	100%

Survey of emission reduction calculation methodology:

District	**Emission reduction calculation methodology**
SCAQMD	No defined method for determining "emissions without controls" emissions in BACT cost analyses. However, usually use the Prohibitory Rule limits to determine industry standard emissions.
BAAQMD	No defined method for determining "emissions without controls" in BACT cost effectiveness analyses. However, usually use the Prohibitory Rule limits to determine industry standard emissions.
SMAQMD	No defined method for determining "emissions without controls" in BACT cost effectiveness analyses. Case-by-case determination is used.

District	Emission reduction calculation methodology
YSAQMD	No defined method for determining "emissions without controls" in BACT cost effectiveness analyses. Case-by-case determination is used.
SDAPCD	No defined method for determining "emissions without controls" in BACT cost effectiveness analyses. However, for new and modified equipment that has never triggered BACT, usually use AP-42 to determine “emissions without controls” unless something else makes more sense. For modified equipment that has previously been subjected to BACT, they calculate the emission reductions from the currently permitted emission rate.
CARB	No guidance available
EPA	General guidance is the “emissions without controls” is the realistic upper boundary of uncontrolled emissions, i.e. the highest emitting operation that the facility would use (in the absence of a rule requirement).

When performing a cost effectiveness analysis, most other Districts calculate the emission reduction based on the allowable emissions in District Rules, and not on emissions from equipment available on a nationwide basis.

IV. Options For Revising The SJVAPCD BACT Policy:

Option #1: Do not change current cost thresholds and emission reduction calculation methodology

An examination of the results of SJVAPCD cost effectiveness analyses performed using the SJVAPCD’s current thresholds and emission reduction calculation methodology and using other Districts’ cost effectiveness thresholds and emission reduction calculation methodology revealed that results are typically similar, i.e. the current method usually results in BACT requirements no more or less stringent than other Districts’ BACT requirements. However, continuing to use the current system can result in the impression by oversight agencies and others that the SJVAPCD’s BACT requirements are less stringent than those of other Districts.

Additionally, using “nationwide emissions” in cost effectiveness calculations is problematic; the determination of such an emission level is somewhat subjective and such equipment can not typically be operated in the SJVAPCD.

Option #2: Increase the cost thresholds to the average of the other surveyed Districts and change the methodology used in calculating the emission reduction to that used by most other Districts, i.e. calculate the emission reductions as the difference between emissions required by SJVAPCD rules and emissions with technologically feasible controls.

Some of the Districts surveyed have a similar non-attainment status as the SJVAPCD (SCAQMD, SMAQMD, and YSAQMD) and others have a lesser non-attainment status (BAAQMD and SDAPCD). Districts with better air quality generally have lower cost effectiveness thresholds. As such their cost effectiveness thresholds tend to decrease the average cost effectiveness threshold.

Because of the SJVAPCD's extreme non-attainment status for ozone and non-attainment status for PM2.5, using the average of the other District's cost effectiveness thresholds in the SJVAPCD may not be adequately protective of the SJVAPCD's air quality.

Option #3: Increase the cost thresholds to the highest of the other surveyed Districts and change the methodology used in calculating the emission reduction to that used by most other Districts, i.e. calculate emission reductions as the difference between industry standard emissions (i.e. emissions required by SJVAPCD rules) and emissions with technologically feasible controls.

Option #3 is the recommended approach given the SJVAPCD's extreme non-attainment status. In addition, using SJVAPCD rule limits (or permitted emission limits) as the starting point for calculating emission reductions from installing technologically feasible controls is less subjective and is a better estimate of the actual emission reduction achievable due to installing technologically feasible controls.

V. Proposed Cost Effectiveness Thresholds And Emission Reduction Calculation Methodology

The proposed cost effectiveness thresholds (option #3) to determine if a technologically feasible control technology is cost effective are as follows:

Pollutant	Cost effectiveness ($/ton)
NO_x	24,500
CO	300
VOC	17,500
SO_x	18,300
PM_{10}	11,400

Proposed emission reduction calculation methodology:

Cost effectiveness ($/ton) =

$$\frac{\text{Annual cost (\$/year)}}{\text{District Standard Emissions} - \text{Emissions (w/ tech feas BACT) (ton/year)}}$$

Annual costs are equal to annualized cost of utilizing technologically feasible BACT controls on an emission unit that already meets District standard emissions. Annual costs do not include costs necessary to meet District standard emissions.

For new emission units, District standard emissions are equal to the emissions level allowed by applicable SJVAPCD rule requirements once the compliance date, i.e. the date at which the emission unit must meet a specific emission requirement, for the rule has passed. For rules with a phased compliance schedule, the earliest compliance date which applies to the equipment being analyzed shall be used. The emission limits in the applicable SJVUAPCD prohibitory rule shall be those that the particular emission unit is subject to. Please note that if the applicable rule has both a standard and enhanced compliance option, the emission level and earliest compliance date required by the standard compliance option shall be used.

For existing emission units, District standard emissions are equal to the emissions level allowed by the current PTO.

If there is no SJVAPCD prohibitory rule emission limit that applies to the particular new emission unit or if the existing emission unit does not have permitted emission limits, District standard emissions for the unit are equal to the emissions from similar equipment that is commonly available in the District. In no case shall the emissions used be higher than that allowed by State or Federal requirements. If insufficient information is available to make a determination regarding emissions from common available equipment in the District, District standard emissions will be estimated based on EPA's Compilation of Air Pollutant Emission Factors (AP-42), or other references as determined by the SJVAPCD to be appropriate.