San Joaquin Valley
Air Pollution Control District

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) POLICY

Approved By:	Date Revised:
Arnaud Marjollet Director of Permit Services	

I. Purpose

The purpose of this policy is to ensure that Best Available Control Technology (BACT) Determinations are made in a timely and uniform manner and in accordance with the BACT definition in District Rule 2201 - New and Modified Stationary Source Review (NSR).

II. Applicability

This policy applies to all emissions units that are subject to BACT requirements under the District's NSR Rule.

III. Definitions

A. Alternate Basic Equipment or Process – Equivalent basic equipment or process emitting less air pollutants than the basic equipment or process proposed by the applicant. This provision applies only to applications for new equipment.

B. Best Available Control Technology (BACT) – the most stringent limitation or control technique of the following:

1. Has been achieved in practice for such emissions unit and class of source; or

2. Is contained in any State Implementation Plan (SIP) approved by the Environmental Protection Agency (EPA) for such emissions unit category and class of source. (A specific limitation or control technique shall not apply if the owner or operator of the proposed emissions unit demonstrates to the satisfaction of the APCO that such limitation or control technique is not presently achievable); or

3. Is contained in an applicable federal New Source Performance

Standard; or

4. Is any other emission limitation or control technique, including alternative basic equipment or process or changes of control equipment, found by the APCO to be technologically feasible for such class or category of sources or for a specific source, and cost effective as determined by the APCO.

C. Cost Effectiveness Threshold – the threshold, above which a control alternative is not cost effective.

Cost Effectiveness Thresholds ($/ton):

NOx	CO	VOC	SOx	PM10/PM2.5
31,200	400	31,200	23,200	14,500

These thresholds do not directly apply to analyses for control options that would control multiple pollutants. For options that would control more than one pollutant, a Multi Pollutant Cost Effectiveness Threshold (MCET) shall be calculated.

The cost effectiveness threshold shall be adjusted annually based on the California Consumer Price Index as compiled and reported by the Department of Industrial Relations and rounded up to the nearest $100.

If there is not a cost threshold for a pollutant for which BACT is required, the threshold for the most similar pollutant shall be utilized. For example, since ammonia is a PM_{10} precursor, the PM_{10} cost threshold would be utilized to determine the cost effectiveness of an ammonia control option.

D. District Standard Emissions:

For new emission units, District Standard Emissions are equal to the emissions level allowed the by the applicable San Joaquin Valley Air Pollution Control District (District) rule once the final compliance date for the rule has passed. The emission limits in the applicable District prohibitory rule shall be those that the particular emission unit would be subject to. If the applicable rule has both standard and enhanced compliance options, the standard compliance option date and emission standard shall be used.

For currently permitted emission units, District Standard Emissions are equal to the emissions level allowed by the current PTO. If the rule level that the unit is currently subject to is lower than the permitted limit, the applicable rule level shall be used.

If there is no District prohibitory rule limit that applies to the new emission unit or if the existing emission unit does not have permitted emission limits, District Standard Emissions shall be set equal to commercially available emissions levels (as determined by an industry survey) for similar units. If insufficient information is available to make a determination regarding commercially available emissions levels, District Standard Emissions shall be estimated based on EPA's Compilation of Air Pollutant Emission Factors (AP-42), or other references determined by the District to be appropriate.

E. Equipment Life:

An equipment life of 10 years shall be used in cost effectiveness calculations unless a different equipment life is determined by the District to be more appropriate.

F. Interest rate:

The interest rate used in cost effectiveness calculations shall be determined annually as follows:

1) Determine the three year moving average for the previous three years of the annual US Treasure 10-year constant maturity rate security interest rate (see https://fred.stlouisfed.org/series/DGS10#0)
2) Add two percentage points to account for incremental risk
3) Round up the result to the next highest integer

G. Multi-Pollutant Cost Effectiveness Threshold (MCET):

A cost threshold calculated to determine whether an emission control alternative that would control more than one pollutant would be cost effective. Only pollutants for which BACT is triggered shall be included in the calculation. The MCET is calculated as follows:

$$MCET = \sum(\text{ton emission reduction pollutant}_i)^* (\text{cost effectiveness threshold pollutant}_i)$$

H. Small emitter – a small emitter is any stationary source with annual, post-project potential emissions less than 2 tons per year of each affected pollutant or maximum daily emissions below the following levels:

Pollutant	Maximum Daily Emissions (lb /day)
VOCs	30
NOx (as NO2)	40
PM_{10}	30

SOx (as SO2)	30
CO	220

A facility with an annual, post-project potential to emit which exceeds both the daily and the annual limits for at least one of the criteria pollutants is not a small emitter.

I. Technologically Feasible:

A practically applicable emission control technology or technique that, based on physical, chemical, and engineering principles, could be applied to the specific class and category of source in a commercial setting. Technologically feasible control options have not been achieved in practice.

IV. BACT Determination Cutoff Date

For emission sources that apply for an Authority to Construct prior to installation or alteration of an emissions unit, BACT Determinations are to be based upon the control technologies and methods for the same or similar source categories, listed in the District's BACT Clearinghouse on the date the application is deemed complete.

If the proposed emission source is not covered in the District's BACT Clearinghouse as of the date the application is deemed complete, then all other control technologies or methods available as of the date the application is deemed complete must be considered in determining BACT for the project.

In any case, for projects subject to the requirements of District Rule 2201, if written public comments subsequent to the District's preliminary decision identify other control technologies or methods, such technologies or methods must be considered in determining BACT prior to taking final action on the application.

Additionally, subsequent to deeming an application complete, if the District determines that an existing BACT guidelines does not identify the most stringent level of emissions that has been achieved in practice or is technologically feasible, such levels of emissions must be considered in determining BACT requirements prior to taking final action on such an application.

V. District's BACT Clearinghouse

To assist applicants in selecting appropriate control technology for new and modified sources, and to assist the District staff in conducting the necessary BACT analysis, the District will actively update and maintain a BACT Clearinghouse on the District’s website.

The approval of the Director of Permit Services must be obtained prior to

incorporation of new BACT requirements in permits issued by the District. Additionally, the BACT Clearinghouse must be updated for each new determination in accordance with the procedures outlined in this policy. New determinations include those made for a class or category of source not covered in the District BACT Clearinghouse and those made for control equipment or techniques not listed the District BACT Clearinghouse for a particular class or category of source.

VI. Updates to the District's BACT Clearinghouse

A. New and Revised BACT Determinations

The District will take a proactive approach to update the BACT Clearinghouse. Updates to the BACT Clearinghouse may occur when evaluating applications for new and modified sources, or when the District is made aware of and documents any of the following:

1. A new control technology or method is deemed as achieved in practice for a class or category of sources;

2. A new control technology or method is required as a part of any SIP approved by the EPA for a class or category of sources;

3. A new control technology or method is required in an applicable federal New Source Performance Standard; or

4. A new control technology or method is found to be technologically feasible for a class or category of sources.

B. Procedures for Updating the BACT Clearinghouse

Updates to the District's BACT Clearinghouse shall be made in accordance with the following procedures:

1. New or revised BACT proposals may be made by the District staff, the applicants, or the public. New or revised control technology or methods are incorporated in the District's BACT Clearinghouse as the District staff review applications for new and modified sources, or as they become aware of new or revised control technologies or methods that are technologically feasible, achieved in practice, or incorporated in an EPA approved SIP. In order to update the District's BACT Clearinghouse, the following information must be documented:

    a) Name and location of the source utilizing the control technology. Include the type of business and the size of the source. When necessary, information on the size of source

should include data on the emissions unit as well as the stationary source.

b) Manufacturer and type of pollution control device.

c) Performance requirements specified under applicable permits issued by this district or any other permitting agency, or contained in an EPA approved SIP. Include the date of BACT Determination or the effective date of the new standard.

d) Available test or performance data.

e) For addition of a technologically feasible control measure, appropriate technical and engineering data to substantiate technological feasibility for the affected class and category of sources.

2. The above documentation must be forwarded to the Director of Permit Services.

3. Additional and revised Determinations will only be approved if they comply with the definition of BACT in District Rule 2201.

4. Upon approval by the Director of Permit Services, additional and revised Determinations will be posted to the District BACT clearinghouse.

VII. Determination of Achieved-in-Practice

For a control technology to be deemed as having been achieved in practice, the following conditions must be met:

- The rating and capacity for the unit where the control was achieved must be approximately the same as that for the proposed unit.
- The type of business (i.e. class of source) where the emissions units are utilized must be the same.
- The availability of resources (i.e. fuel, water) necessary for the control technology must be approximately the same.

Under the above circumstances, a control technology can be deemed as having been achieved in practice, and can be required as BACT without having to make a cost effectiveness determination.

VIII. BACT Analysis During the Preliminary Review of Applications

The primary purpose of the Preliminary Review of an application is to determine its completeness within the 30-day statutory deadline. To deem the application complete, in addition to the other necessary information, it must contain the necessary data to conduct a top-down BACT analysis, and to ensure compliance with the BACT requirements.

Ordinarily, a detailed BACT analysis will be performed as a part of the Application Review after the application is deemed complete. However, in cases where without a detailed BACT analysis, it is obvious that the proposal does not comply with the BACT requirements, the applicant must be notified of the BACT deficiencies in the form of an application incompleteness letter.

IX. Top-Down BACT Analysis

A top-down BACT analysis shall be performed as a part of the Application Review for each application subject to the BACT requirements pursuant to the District's NSR Rule. The following steps shall be documented in a top-down analysis: (For source categories or classes covered in the BACT Clearinghouse, relevant information under each of the following steps may be simply cited from the Clearinghouse without further analysis.)

A. Step 1 - Identify All Control Technologies

The first step in a top-down analysis is to identify, for the emissions unit in question, all available control options. Available control options are those air pollution control technologies or techniques, including alternate basic equipment or process with a practical potential for application to the emissions unit in question. The control alternatives should include not only existing controls for the source category in question, but also through technology transfer, controls applied to similar source categories and gas streams.

For classes and categories covered in the District's BACT Clearinghouse, the list of available control technologies shall be limited to those listed in the Clearinghouse as of the date the application is deemed complete, except when allowed pursuant to Section IV of this policy.

B. Step 2 - Eliminate Technologically Infeasible Options

In the second step, the technological feasibility of the control options identified in Step 1 is evaluated with respect to the source-specific or emissions unit- specific factors. To exclude a control option, a demonstration of technical infeasibility must be clearly documented and should show, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option for the emissions unit under review.

For classes or categories of sources covered in the District's BACT Clearinghouse, all controls listed as technologically feasible must be considered in the final BACT selection and must not be eliminated in this step.

C. Step 3 - Rank Remaining Control Technologies by Control Effectiveness

In Step 3, all remaining control alternatives not eliminated in Step 2 must be ranked and then listed in order of overall control effectiveness for the pollutant under review, with the most effective control alternative at the top. A separate list should be prepared for each pollutant and for each emissions unit subject to the BACT requirement. The list should present the array of control alternatives and should indicate the effectiveness of each alternative. The list should also indicate if the alternative has been achieved in practice for the class and category of source in question.

D. Step 4 - Cost Effectiveness Analysis

After the identification of available and technologically feasible control options, economic impacts are considered to arrive at the final level of control. After performing a cost effectiveness analysis, in accordance with the procedures outlined in Section X of this policy, control options that are not cost effective, except for controls that are achieved in practice or are required by an EPA approved SIP, shall be eliminated from consideration.

Cost effectiveness analysis is not required under the following circumstances:

1. The applicant is proposing the most effective alternative in the ranking list from Step 3.

2. The most effective alternative in the ranking list from Step 3 has been achieved in practice or is required pursuant to an EPA approved SIP for the class and category of source in question.

3. Cost effectiveness analysis is not required for control alternatives which are deemed achieved-in-practice, except for achieved-in-practice alternate basic equipment or process. (A cost effectiveness analysis must always be conducted before requiring alternate basic equipment or process.)

4. Except for alternate basic equipment or process, a new cost effectiveness analysis is not required if cost effective analysis for the specific piece of equipment or operation was conducted by the District within 12 months preceding the date an application is received. A copy of the prior cost effectiveness analysis shall be attached to the Application Review, and its applicability must be documented in the Application

Review.

E. Step 5 - Select BACT

The most effective control option not eliminated in Step 4 is select as BACT for the pollutant and emissions unit under consideration, except for the following:

1. Unless proposed by the applicant, technologically feasible and cost effective control that is more effective than the achieved-in-practice option shall not be required for a small emitter. A small emitter shall be required to use the most effective control technology or equipment that has been achieved-in-practice, including achieved-in-practice alternate basic equipment and process for new equipment.

2. Alternate basic equipment or process shall not be required for modifications to, or transfer of location of existing equipment with valid District Permit to Operate.

3. Alternate basic equipment or process shall not be required if its use results in an increase in emissions within the District.

4. The applicant may propose to use any control technology other than the control technology required by the District if they can demonstrate that the proposed control technology can reduce air pollutant(s) as, or more, effectively than the required control technology.

X. Procedures for Conducting Cost effectiveness Analysis

A. Technologically Feasible Alternatives

1. Calculate an equivalent annual cost from a capital cost using a capital recovery factor as shown below:

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1}$$ where:

A = Equivalent Annual Control Equipment Capital Cost

P = Present value of the control equipment, including installation cost

i = interest rate

n = equipment life

2. Determine annual operating cost (labor, fuel, maintenance, utilities, etc.).

3. Calculate the total annual cost by summing the equivalent annual control equipment cost and the annual operating cost (Steps 1 and 2 above).

4. If BACT controls only one type of air pollutant, calculate the control cost per ton of air pollutant reduced by dividing the total annual cost (Step 3) by the annual emission reduction for the air pollutant. If the control cost per ton exceeds the cost effectiveness threshold, the BACT control option is not required.

5. If a BACT option controls more than one type of air pollutants, calculate a Multi-Pollutant Cost Effectiveness Threshold (MCET) for the control option using the process shown below.

   Example: If a control strategy reduces 2 tons of NO_x, 4 tons of SO_x, and 0.1 ton of particulate matter, the MCET would be calculated as follows:

   MCET = (2 tons NOx/yr) * ($31,200/ton NOx) +
   (4 tons SOx/yr) * ($23,200/ton SOx) +
   (0.1 ton PM/yr) * ($14,500/ton PM)
   = $156,650 per year

   If the total annual cost, (Step 3) exceeds this MCET, the control technology or equipment under review cannot be required as BACT.

6. If the control technology or equipment is not cost effective, perform the cost effectiveness analysis for the next less stringent control technology or equipment as appropriate.

B. Alternate Basic Equipment or Process:

1. Calculate the cost effectiveness of alternate basic equipment or process using the following formula:

   $CE_{alt} = (COST_{alt} - COST_{basic}) / (EMISSION_{basic} - EMISSION_{alt})$ where:

   CE_{alt} = the cost effectiveness of alternate basic equipment expressed as dollars per ton of emissions reduced

   $COST_{alt}$ = the equivalent annual capital cost of the alternate basic equipment plus its annual operating cost

   $COST_{basic}$ = the equivalent annual capital cost of the proposed basic equipment, without BACT, plus its annual operating cost

$EMISSION_{basic}$ = the emissions from the proposed basic equipment, without BACT

$EMISSION_{alt}$ = the emissions from the alternate basic equipment

XI. Enhanced Procedures to the BACT Policy

As authorized and directed by the Governing Board on August 19, 1999, the District implemented the following measures aimed at enhancing public participation and involvement in the BACT Determination process:

1. The District will hold public workshops prior to finalizing BACT Determinations that will have a potential impact on a large category for which the new determination may represent a significant change in technology,

2. The District will develop and maintain an electronic BACT Information Exchange Center. The Center will:

    a. Offer a forum for interested parties to share pertinent information on various air pollution control technologies, including feedback on operator's experience with the control technology and other related information;
    b. Provide information on new control technologies which are being proposed by facilities within the District, are under development by manufacturers, or have been approved as BACT by other agencies;
    c. Make available comments received from oversight agencies on District projects involving BACT Determinations; and
    d. Inform the public of pending new and revised BACT Determinations.

3. The District will provide a quarterly report to the Governing Board summarizing new and revised BACT Determinations for the preceding quarter.