AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

RULE 67.24 - BAKERY OVENS

1ST WORKSHOP REPORT

A workshop notice was mailed to all companies that operate bakeries in San Diego County. Notices were also mailed to all Chambers of Commerce in San Diego County, all Economic Development Corporations, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The workshop was held on November 5, 1992, and was attended by 11 persons. Written comments were also received. The workshop comments and District responses are as follows:

1. WORKSHOP COMMENT:

Rule 67.24 requires that all process information records be kept on site and made available to the District upon request. Will these records be maintained as confidential information, or are they subject to public disclosure?

DISTRICT RESPONSE:

In general, the records will be subject to public disclosure. However, any facility which considers its records to be "trade secret" should submit a request for confidentiality, as stipulated in District Rule 176.

2. WORKSHOP COMMENT:

Rule 1153 of the South Coast Air Quality Management District (SCAQMD) for bakery ovens allows the use of equivalent test methods if they are approved by that District. Rule 67.24 should provide the same flexibility.

DISTRICT RESPONSE:

The District disagrees. The use of equivalent test methods in general must also be reviewed and approved by ARB and EPA. This approval is a very lengthy process, and should only be used if the standard test methods are not adequate for a specific purpose. The EPA reference test methods specified in Rule 67.24 have been successfully used for determination of VOC emissions from bakery ovens in California and other states.

3. WORKSHOP COMMENT:

How often would the District conduct source tests to determine efficiency of emission control devices?

DISTRICT RESPONSE:

Once the emission control system is installed, the District will require an initial source test to be conducted verifying the emission reduction efficiency. Thereafter, daily compliance with the rule will be ensured by monitoring and recording key system operating parameters such as temperature, pressure or flow rates. Initial re-testing may be annual. Depending on the reliability of the control equipment and its performance, testing thereafter may be less frequent or less extensive.

4. WORKSHOP COMMENT:

The South Coast AQMD Rule 1153 provides for a one year postponement of compliance schedule dates if a bakery elects to install a new 'replacement' oven within one year after the rule adoption. Rule 67.24 should contain such a provision.

DISTRICT RESPONSE:

The District does not agree that a one year postponement of the final compliance date is necessary if a bakery elects to replace an existing oven. While SCAQMD Rule 1153 provides a one year postponement for the implementation of emission control in such cases, it requires a bakery to submit a compliance plan for the oven replacement within one year of the rule adoption. Proposed Rule 67.24 provides a bakery a one year period after rule adoption to apply for an Authority to Construct to install an air pollution control system, or replace the old oven with a new oven with necessary emission controls, and then two more years to demonstrate compliance with the rule.

Essentially, both rules require that within a year of adoption, a facility must make a decision on how to comply with the rule. It should be noted that in order to make an informed decision, the facility should conduct a technical and economic feasibility analysis of available options. Once such an analysis is completed and a decision is made, most information necessary to apply for the District's Authority to Construct is available. Two more years as provided in the rule should be sufficient time either to install air pollution control equipment on the old oven, or to install a new oven and air pollution control equipment, since new ovens can be installed as a package with air pollution control equipment included. The rule has been revised to clarify this.

5. WRITTEN COMMENT:

The cost-effectiveness of this rule, projected at $3.14 to $3.45 per pound of VOC's, is significantly higher than $1.38/lb for the Bay Area Air Quality Management District (BAAQMD), or $0.85/lb for the SCAQMD.

DISTRICT RESPONSE:

The cost-effectiveness values cited were contained in the tactic for bakeries included in the District's 1991 Regional Air Quality Strategy (RAQS). Those projections were based on now outdated EPA emission factors. The District has now calculated cost-effectiveness values using emission factors derived from the new EPA formula as well as recent District source testing. They are $1.10 to $2.00 per lb of VOC reduced and are consistent with those of the BAAQMD and SCAQMD.

6. WRITTEN COMMENT:

A bakery should not be subject to the control requirements of Rule 67.24 if it reduces its emissions below 25 tons per year through process modifications and/or production cutbacks before the rule goes into effect.

DISTRICT RESPONSE:

The 1990 Federal Clean Air Act Amendments require the District to adopt rules reflecting Reasonably Available Control Technology (RACT) for major stationary sources. For San Diego County, identified as a "severe" federal ozone non-attainment area, a major source is a facility which emits 25 tons per year or more of VOC's. For existing sources, EPA considers a facility which emitted 25 tons per year or more of VOC's in 1990 or after a major source. However, if actual VOC emissions from such a source are below 25 tons per year at the time the rule is adopted, the source could agree to accept

federally enforceable permit terms and conditions limiting its potential to emit to less than 25 tons per year. Such limitations must be subject to a public notice, a public comment period, and a 45-day federal EPA review period.

7. WRITTEN COMMENT:

Recent technology shows the potential for process changes which, alone or in combination with control equipment, could provide 90 percent VOC emission reduction. The rule should be revised to allow this possibility.

DISTRICT RESPONSE:

The District agrees. The rule has been revised to require 90 percent reduction of VOC emissions, and to provide for the option of achieving this by using air pollution control equipment.

8. WRITTEN COMMENT:

The compliance schedule in the rule requires a facility to apply for an Authority to Construct two years before the final compliance date and to issue purchase orders fifteen months before the final compliance date. This schedule is too restrictive to allow facilities to take advantage of any improved technology that may become available before the final compliance date.

DISTRICT RESPONSE:

The District agrees. The compliance schedule has been revised to delete the requirement to issue purchase orders for equipment. This change will provide a facility the flexibility to choose the most recent technology, in a time frame allowed by the final compliance date. If a facility finds alternative technology after submitting an application or receiving an Authority to Construct, the operator can request an amendment to the application or Authority to Construct to reflect this alternative technology.

9. WRITTEN COMMENT:

The requirements for an Operation and Maintenance plan involve the District in counter-productive micro-management of emission control equipment. This subsection should be deleted.

DISTRICT RESPONSE:

The District disagrees. The Operation and Maintenance plan is one of the tools used to ensure continued compliance with Rule 67.24. All District rules containing a requirement for add-on control equipment have provisions for Operation and Maintenance Plans.

10. WRITTEN COMMENT:

The definition of "Fermentation Time" should exclude time in which the dough or sponge is refrigerated to retard the fermentation process, and therefore VOC formation.

DISTRICT RESPONSE:

The District agrees. The "Fermentation Time" definition has been modified, and a definition for "Retardation Time" has been added.

11. WRITTEN COMMENT:

The definition for "Volatile Organic Compound" should be modified to exclude ethane.

DISTRICT RESPONSE:

The District disagrees. ARB has determined that ethane is a photochemically reactive organic compound, i.e. a VOC. In addition, the amount of ethane emissions from a properly operating bakery oven is negligible, and should have little or no impact on the total calculated amount of VOC emissions from a facility.

12. WRITTEN COMMENT:

Rated heat input capacity is not a useful indicator of bakery oven emissions. The rule exemption of 2 million BTU/hr combined heat capacity should be deleted, and all facilities with less than 25 tons per year emissions should be exempt from the entire rule.

DISTRICT RESPONSE:

The District disagrees. If the suggested exemption based on the amount of emissions were adopted, all bakeries, regardless of size, would be required to keep records necessary to calculate their annual VOC emissions.

On the other hand, extensive data gathered in other air districts on emissions from bakery ovens showed that the VOC emissions from ovens with a rated heat capacity less than 2 million BTU/hr are not significant. Therefore, the exemption based on the oven rated heat capacity in the proposed rule will relieve small sources from unnecessary recordkeeping requirements.

13. WRITTEN COMMENT:

The rule requirement to keep separate records for each oven is unnecessary.

DISTRICT RESPONSE:

The District agrees. The rule has been revised to only require records for the facility as a whole, not each oven.

14. WRITTEN COMMENT:

The records for current recipe parameters, i.e. yeast percentage and fermentation time, should be kept monthly to match production rates.

DISTRICT RESPONSE:

The District disagrees. Although production rates are expected to fluctuate, recipe parameters may never change. If they do change, such changes need to be kept current by recording them when they occur. Also it should be noted that the revised rule requires annual instead of monthly recordkeeping.

15. WRITTEN COMMENT:

EPA has approved BAAQMD Rule 42, which allows bakeries to control emissions from the oven stack having the highest emission rate. This acknowledges that stacks such as purge stacks and comfort hood vents do not have significant emissions. Rule 67.24 should contain these provisions.

DISTRICT RESPONSE:

The current BAAQMD Rule 42 requires controls on all regular oven stacks. However, purge stacks and comfort hood vents are expected to have negligible emissions and proposed Rule 67.24 has been revised to exclude these stacks from control requirements.

16. WRITTEN COMMENT:

BAAQMD Rule 42 exempts ovens used exclusively for products other than breads, buns, and rolls. Such an exemption should be included in Rule 67.24.

DISTRICT RESPONSE:

The District disagrees. There is no information available to the District which demonstrates that ovens used for baking yeast leavened products other than breads, buns, and rolls have lower VOC emissions than ovens baking these products.

17. WRITTEN COMMENT:

The table in Rule 67.24 uses emission factors derived from the equation developed by the American Institute of Baking (AIB). The EPA recently published the Alternative Control Technology (ACT) Document which contains another equation for determining emission factors, developed by EPA with new source test data. Rule 67.24 should provide for the use of both equations.

DISTRICT RESPONSE:

The District disagrees. These equations cannot be used interchangeably because in many cases they result in significantly different emission estimates. In addition, EPA has recently disapproved the BAAQMD test method for determination of VOC emissions from bakery ovens because it contained serious experimental flaws. This invalidates the AIB equation since the BAAQMD test method was used in the determination of the AIB emission factors.

The equation suggested in the ACT document was derived based on the emission data obtained using EPA approved test methods. However, the coefficients in this equation were determined solely by regression analysis, and the equation's usefulness for predicting accurate emission factors was never verified using another independent set of emission data.

The District recently conducted a source test for one of the bakeries in San Diego County. Emission factors determined from the test results deviated significantly from those predicted by the ACT formula. Based on the results of the source test and the above considerations, Rule 67.24 has been significantly revised. The table based on AIB emission factors has been deleted. Subsection (b)(3) now requires that EPA's ACT equation be used for the calculation of VOC emissions from bakery ovens. However, if the calculated emissions for a facility are 20 or more tons per year, which represents 80 percent of the rule threshold for the application of add-on control technology, the facility must conduct source testing to verify calculated emission rates.

18. PRE-WORKSHOP COMMENT:

Some bakery ovens are extremely old, and determining the combined rated heat input capacity in these cases may be difficult.

DISTRICT RESPONSE:

If burner rating specifications for ovens are unavailable from the manufacturer, a fuel consumption rate derived from the utility meter readings during the oven start-up period can be used for determination of combined oven capacity. The rule has been revised to include such a provision.

19. PRE-WORKSHOP COMMENT:

The emission factors in Rule 67.24, which were based on the study by the American Institute of Baking (AIB), may not provide accurate emission estimates for sweet goods. The BAAQMD rule exempts sweet goods such as sweet rolls, croissants, and danishes. Rule 67.24 should do the same.

DISTRICT RESPONSE:

The District disagrees. Upon examination of BAAQMD Rule 42, an exemption for ovens baking sweet goods could not be found. Additionally, Rule 67.24 has been revised to require the use of EPA's ACT formula. The ACT formula may not predict accurate emission factors for the baking of sweet goods. However, for the few bakeries in San Diego County which specialize in sweet goods, emission estimates using the ACT formula are far below the proposed 20 tons per year source testing threshold. Therefore, the accuracy of these estimates should be sufficient for purposes of Rule 67.24.

20. PRE-WORKSHOP COMMENT:

What types of records required by the rule will be acceptable to the District Compliance Division?

DISTRICT RESPONSE:

The revised rule requires annual recordkeeping based on a calendar year. For annual recordkeeping, production records based upon individual product batch records or sales records could be compiled at the end of the calendar year. This information will essentially be the same as submitted for the District survey of early 1992.

21. PRE-WORKSHOP COMMENT:

Would the weight of dried fruit, such as raisins in raisin bread, count as part of the weight of finished baked product, in using the emission factors for Rule 67.24?

DISTRICT RESPONSE:

No, the weight of dried fruit would not count toward the weight of finished baked product in the use of emission factors for Rule 67.24. The District recommends excluding weight of fruit from such products when reporting production rates.

22. ARB COMMENT:

The District should consider requiring 95 percent emission reduction for ovens emitting more than 13 tons per year, as required by SCAQMD Rule 1153. Requirements less stringent than 95 percent reduction may not satisfy the requirements of the California Clean Air Act.

DISTRICT RESPONSE:

The California Clean Air Act requires that the District's rules applicable to non-attainment pollutants and their precursors contain the Best Available Retrofit Control Technology (BARCT). The BARCT Guidance Documents for VOC and NOx sources are being developed by statewide Technical Review Group committees which include representatives of the ARB, the EPA and local districts. However, the BARCT determination for bakery ovens has not yet been developed.

The control requirements in SCAQMD Rule 1153 do not necessarily represent BARCT. In addition, for control equipment such as catalytic oxidizers, the 90 percent control efficiency is more realistic than 95 percent on an ongoing basis.

The present exemption level (25 tons per year of VOC emissions) in Rule 67.24 reflects the requirements of the Federal Clean Air Act Amendments of 1990. Any possible future changes to the exemption level will be determined based on the economic feasibility and the cost-effectiveness of control technology required as part of the statewide BARCT determination process.

23. ARB COMMENT:

Section (b)(3) in the rule should reference a test method for determining annual VOC emissions for the 25 tons per year exemption.

DISTRICT RESPONSE:

The rule has been revised to include the methods for determination of annual VOC emissions from bakery ovens.

24. ARB COMMENT:

The rule should contain a provision for verifying and quantifying the presence of perfluorocarbon exempt compounds.

DISTRICT RESPONSE:

The District disagrees. Although perfluorocarbons are manufactured compounds which may be present in coating materials, they will not be present in bakery oven emissions, nor will anyone claim them to be.

25. EPA COMMENTS:

The EPA Region IX had no comments at this time but reserved the right to make future comments on any changes or modifications to the rule.

PC/jo

San Diego Air Pollution Control District
9150 Chesapeake Drive, San Diego, CA 92123

ID No.
FOR APCD USE ONLY

1991 and 1990 BAKERY EMISSIONS INVENTORY

Complete this form for locations that produce yeast-leavened bakery products. Please duplicate this form, as necessary, to use for additional baked products.

Address:

Bakery Name: _____ _____

dba (if different) _____ _____

Phone Number: _____ _____

Oven ID	Baked Product	Yeast Percentage		Fermentation Time		Annual Production	
		Step 1	Step 2	Step 1	Step 2	in 1991	in 1990

Oven ID - any bakery reference used; for example, Oven 1, Oven 2, etc.

Baked Product - brief description; for example, wheat loaves, white buns, etc.

Yeast Percentage - expressed as percent of total flour (baker's %). If yeast is added in 2 steps, please list separately

Fermentation Time - if yeast is added in 2 steps, please list separately the time for each step (in hours). Total time should equal time from initial yeast addition to entrance into oven.

Annual Production - (in 1000's of pounds of final baked product) for 1991 and 1990 calendar years.

Do any ovens have air pollution control equipment for ethanol emissions? Yes: ☐ No: ☐

"The information herewith submitted is based on records for actual 1990 and 1991 production for this facility. Where records were not available, estimates have been made based on sound judgment."

Contact Name: Signature: Date:

_____ _____ _____

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

RULE 67.24 - BAKERY OVENS

2ND WORKSHOP REPORT

A workshop notice was mailed to all companies that operate bakeries in San Diego County. Notices were also mailed to all Chambers of Commerce in San Diego County, all Economic Development Corporations, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The proposed rule and Socioeconomic Impact Assessment (SIA) were presented for public comment. The workshop was held on January 20, 1994, and was attended by six people. Written comments were also received. The workshop comments and District responses are as follows:

1. WORKSHOP COMMENT:

If San Diego County's classification as a federal ozone nonattainment area is changed from 'severe' to 'serious', the federal major source threshold will change from 25 tons to 50 tons per year. Would the exemption level for emission control requirements in Subsection (b)(3) be changed accordingly?

DISTRICT RESPONSE:

No. In addition to federal requirements, the District must also meet California Clean Air Act requirements and implement all technically and economically feasible emission control measures. Such measures included in the District's 1991 Regional Air Quality Strategy (RAQS) are expected to be cost-effective for bakeries emitting 25 tons of VOC's per year or more. Therefore, an increased exemption level in Subsection (b)(3) would not meet state requirements.

2. WORKSHOP COMMENT:

Subsection (b)(1) exempts a bakery which has a combined rated capacity of all its ovens of less than two million BTU per hour. Would the District expect this exemption level to be changed in the future?

DISTRICT RESPONSE:

No. The Subsection (b)(1) exemption level is based on extensive data gathered in other air districts which showed that VOC emissions from ovens with a rated capacity less than two million BTU per hour are significantly less than 25 tons per year.

3. WORKSHOP COMMENT:

What purpose does the definition for 'purge stack' in Subsection (c)(5) serve?

DISTRICT RESPONSE:

Purge stacks are specifically exempt from the emission control requirements of the proposed rule in response to a comment received at the first workshop. The definition is needed to clarify this exemption.

4. WORKSHOP COMMENT:

Proposed Rule 67.24 requires 90 percent emission reduction from bakery ovens. The District maintains that this control level represents Reasonably Available Control Technology (RACT), and is mandated by EPA for VOC sources not subject to the existing or projected Control Technique Guideline (CTG) documents. However, regulations proposed in other states such as Texas and Arizona require emission reduction significantly less than 90 percent.

DISTRICT RESPONSE:

The Texas Office of Air Quality has confirmed that a proposed bakery rule requiring 30 percent emission reduction will be adopted in a few months. However, EPA Region VI informed the District that the rule is expected to be disapproved because it does not meet federal RACT requirements. A proposed bakery rule being developed in Arizona for the Phoenix area may not need to meet federal RACT requirements, as there may be no bakeries which are federal major sources. The Phoenix area is a 'moderate' ozone nonattainment area, and its major source threshold is therefore 100 tons per year of VOC's.

5. WORKSHOP COMMENT:

Why has Rule 67.24 been revised to replace the equation for emission factors developed by the American Institute of Baking (AIB) with the new equation published in EPA's Alternative Control Technology (ACT) document?

DISTRICT RESPONSE:

The AIB emission factors were based on the results of source tests conducted by the Bay Area Air Quality Management District (BAAQMD) using the test method developed by that District. EPA cited serious concerns with this method at the time of the proposed Rule 67.24 revision. Therefore, the District decided to use emission factors from the equation in the EPA ACT document, which was based on results of source tests conducted using the standard EPA test methods. Since the second workshop, however, EPA has approved the BAAQMD test method, thus Rule 67.24 has been revised to incorporate both equations.

It should be noted that these equations are based only on a regression analysis of a limited amount of source test data (not on the comprehensive theory of baking processes) and are not independently verified. As a result, the emission factors calculated from these equations can differ significantly, sometimes by as much as a factor of three. Therefore, Rule 67.24 specifies that if VOC emissions from a facility calculated by both equations are significantly different, the highest emissions estimate must be used for the facility. For facilities where the highest emissions estimate exceeds 20 tons per year (80% of the federal major source threshold), the rule requires that a source test be conducted. The rule also specifies EPA standard test methods, however other EPA approved test methods such as BAAQMD Method ST-32 can be used provided that they are also approved by the District.

6. WORKSHOP COMMENT:

Were the EPA methods specified in Section (f) used in the emissions testing that the District performed recently at one of the large bakeries?

DISTRICT RESPONSE:

Yes. The tests were performed using EPA Methods 18 and 25A.

7. WORKSHOP COMMENT:

Will the District pay for the emissions testing at the other large bakery that has not yet been tested?

DISTRICT RESPONSE:

No. Emission testing was conducted at one large bakery as part of the rule development process when it became evident that the emission factors predicted by the EPA and AIB equations for this bakery differed significantly. New emission factors obtained from the test have been used to calculate annual VOC emissions for this bakery. The result was not consistent with estimates predicted by either the AIB or EPA equation, and was interpreted as evidence that both empirical equations do not always reflect the actual variations in emission factors from baking processes. Based on this result, Rule 67.24 was revised as discussed earlier to require emission testing in certain cases. Such emission testing should typically be performed at the expense of the affected facility.

In addition, the rule has been revised to specify that if a facility elects to comply with Subsections (d)(2) and (g)(1) with the installation of emission controls, it would not be required to provide for emissions testing under Subsection (g)(3).

8. WORKSHOP COMMENT:

Do the test methods in Section (f) address specific aspects of the testing that the District performed recently at one of the large bakeries, such as the number of baked products tested, and the resulting extrapolation of emission factors for the other product lines at the bakery?

DISTRICT RESPONSE:

No. EPA Methods 18, 25, and 25A, specified in Subsection (f), are standard test methods for determining VOC emission rates from any point source, e.g. a stack. The result(s) obtained from such tests are mass emission rates, e.g. pounds per hour of VOC's. The EPA test procedures do not generally include any specific characteristics of the processes being tested for VOC stack emissions, such as the number of products tested in a bakery operation. The number of products tested would be determined based on best technical judgment considering, where possible, economic and time constraints, the selection of products that represent a majority of bakery production and/or emissions, and restrictions in the bakery's production schedules.

The extrapolation of emission factors to estimate emissions from the other product lines at the bakery was performed based on the District test results, and based on available test information from the American Institute of Baking (AIB) and EPA studies.

9. WORKSHOP COMMENT:

The four baked products tested for emission factors at the large bakery may not be a representative sampling of that bakery's many product lines. The new EPA equation was developed through an extensive testing process, and should be used to determine emission factors for the other product lines.

DISTRICT RESPONSE:

The equation in EPA's ACT document was derived based on emission data obtained from testing at four bakeries, and included test runs on 18 product lines (i.e. four or five products for each bakery)

with either a one-step or a two-step yeast addition. This equation was determined solely by statistical analysis, and its usefulness for predicting accurate emission factors was never verified using another independent set of emission data. In the absence of such verification, there is no basis for rejecting emission factors based on specific source test results for this bakery in favor of emission factors based on a general industry correlation.

A statistical analysis of the emission factor parameters for the affected bakery's products showed that the resulting annual emissions estimate remains above 50 tons per year within a 95 percent confidence interval. Therefore, the added expense associated with additional emissions testing to improve the accuracy of the extrapolation may not be justified, since the applicability of Rule 67.24 for the affected facility would not change.

10. WORKSHOP COMMENT:

What type of daily records are required to be collected and retained according to Subsection (e)(3)?

DISTRICT RESPONSE:

Subsection (e)(3) requires daily records of control system operating parameters. For example, the temperature of the exhaust from a catalytic oxidizer may need to be recorded. This is often accomplished by automated 'strip chart' recorders, but it may also be accomplished by reading from a calibrated temperature gauge and manually entering the reading into a written log or a computer. The raw data, whether on strip charts, log sheets, or computer printouts, should be retained for at least three years.

11. WORKSHOP COMMENT:

Subsection (c)(1) defines a bakery oven, in part, as a 'convection oven'. However, in some of the newer bakery ovens the heat transfer occurs not by convection, but by radiation. Does the District intend to exclude these ovens from requirements of Rule 67.24?

DISTRICT RESPONSE:

No. This is not the intent of the District, and proposed Rule 67.24 has been revised to apply to any bakery oven, regardless of the heat transfer mechanism involved.

12. WORKSHOP COMMENT:

Some bakery ovens are indirectly fired, i.e. the combustion exhaust stream does not pass through the oven baking chamber. Is Rule 67.24 intended to require the combustion exhaust from such ovens to be ducted to an air pollution control device?

DISTRICT RESPONSE:

No. This is not the intent of the District, and proposed Rule 67.24 has been revised to exclude combustion exhaust stacks on indirectly fired ovens from VOC emission control requirements.

13. WORKSHOP COMMENT:

Does the air pollution control equipment currently available to bakeries achieve 90 percent emission reduction?

DISTRICT RESPONSE:

Yes. Thermal and catalytic oxidizers often achieve greater than 95 percent efficiency. However, for catalytic oxidizers 90 percent efficiency will be more realistic to achieve than 95 percent on an ongoing basis.

14. WRITTEN COMMENT:

Ethanol, the primary VOC emitted from bakery ovens, has low photochemical reactivity and therefore contributes little to ozone nonattainment. District regulations should instead require automobile fuels to be converted to natural gas, thereby reducing emissions of more photochemically reactive VOC's.

DISTRICT RESPONSE:

The District disagrees. The VOC definition in District rules complies with federal requirements and does not distinguish between organic compounds of different degrees of reactivity.

15. WRITTEN COMMENT:

Rule 67.24 should provide bakeries flexibility in achieving VOC emission reductions from sources other than the ovens, such as conversion of bakery fleet vehicles to natural gas.

DISTRICT RESPONSE:

The District disagrees. State and federal requirements such as those for 'clean fuel' vehicles continue to increase, and such measures are included in the District's 1991 Regional Air Quality Strategy (RAQS). These requirements apply in addition to the federal RACT requirements, not in lieu of them.

16. WRITTEN COMMENT:

New technologies involving heat exchangers are being developed to make bakery ovens more energy efficient. They can reduce ethanol emissions by approximately 70 percent through condensation while avoiding the energy consumption, nitrogen oxides emissions, and high capital and operating expenses associated with catalytic oxidizers. Rule 67.24 should allow flexibility to use such new technologies.

DISTRICT RESPONSE:

Rule 67.24 does not specify that any particular method of compliance be used. As discussed earlier, the 90 percent emission reduction standard in proposed Rule 67.24 meets current federal requirements as RACT for bakeries. This standard is based upon proven add-on emissions control technology which has been applied in the field, e.g. catalytic oxidation.

In the future, emerging technologies which may achieve less than 90 percent emission reduction but which nevertheless can provide benefits over conventional technologies could be addressed by the District as source-specific SIP revision(s) subject to EPA approval.

17. ARB COMMENT:

Subsection (d)(2)(ii) refers to 'fugitive' VOC's. A definition for fugitive VOC's should be included.

DISTRICT RESPONSE:

The term 'fugitive' is not essential here, and for clarity it has been deleted from Subsection (d)(2)(ii).

18. ARB COMMENT:

Subsection (e)(2) refers to a 'calendar year'. To avoid confusion with a fiscal year, a definition for 'calendar year' should be included.

DISTRICT RESPONSE:

The District considers the term 'calendar year' to be sufficiently self-defining as the period from January 1 to December 31. The District also considers the term as being easily distinguishable from the term 'fiscal year'.

19. EPA COMMENT:

The recordkeeping requirements of Section (e) require all bakeries subject to the rule to keep records. However, the workshop notice describes the emission control requirements for major sources, and then indicates that the rule "... will also require moderate-sized bakeries that are not federal major sources to keep yearly records." Furthermore, the SIA states that "... Only the two smaller bakeries will be required to keep yearly [records]." Is the rule intended to apply recordkeeping requirements differently to the larger bakeries?

DISTRICT RESPONSE:

All bakeries subject to the rule are subject to the same annual recordkeeping requirements for production and recipe parameters. Any indication to the contrary in the workshop notice was unintentional.

20. EPA COMMENT:

Subsection (e)(3) specifies a requirement to maintain daily records of key system operating parameters for emissions control equipment. This subsection should include additional wording specifying that records sufficient to document continuous compliance be kept.

DISTRICT RESPONSE:

Subsection (e)(3) has been revised as suggested.

COMMENTS REGARDING THE SOCIOECONOMIC IMPACT ASSESSMENT

21. WORKSHOP COMMENT:

The Socioeconomic Impact Assessment (SIA) for Rule 67.24 indicates that the annual cost of compliance is estimated to be greater than ten percent of the annual Return on Equity (ROE) for the affected bakeries, thus exceeding an ARB criterion for significant economic impact. What effect does this have on proposed Rule 67.24?

DISTRICT RESPONSE:

State law requires that the District prepare SIA's to evaluate socioeconomic impacts for certain proposed rules and make a good faith effort to minimize adverse impacts. However, the efforts to minimize the economic impacts of a rule cannot be to the extent that the rule no longer meets the minimum statutory requirements.

ARB notes that its 'percent of ROE' guidance does not consider that compliance costs might be passed on to the customers of the affected business. As indicated in the SIA, the estimated cost of compliance would result in a cost increase of about 0.5¢ per pound of bread. It seems likely that bakeries will be able to pass on this cost to their customers and will not have to absorb all costs themselves. (See also the responses to Comments 22 and 23).

22. WORKSHOP COMMENT:

On what basis did the District conclude that the bakeries will likely be able to pass on cost increases?

DISTRICT RESPONSE:

As indicated in the SIA, general cost increases much larger than compliance costs which would result from Rule 67.24 have typically been passed on to supermarkets and convenience stores. These past price increases were verified by the District with the managers of such stores. The price increases were in turn passed on to consumers.

23. WORKSHOP COMMENT:

Bakeries that typically can pass on cost increases are those that bake the 'white bread' products sold to supermarkets. However, for bakeries which produce the more specialized whole grain products and/or which contract to sell products to businesses such as 'fast food' restaurant chains or 'warehouse' club chains, pricing is much more competitive, and it may be difficult to pass on any cost increase.

DISTRICT RESPONSE:

The District contacted local fast food restaurant chains, warehouse club chains, and the economics faculty at San Diego State University. This investigation showed that, although the general claim stated above may be valid for substantial price increases, it will not be true for a cost increase as small as 0.5¢ per pound.

In addition, in order to avoid passed on Rule 67.24 compliance costs, bakery customers would have to switch to other suppliers. The District's investigation has indicated that alternative suppliers will

be primarily from the South Coast air district, where bakeries are currently installing emissions control equipment and are expected to pass on similar compliance costs.

24. WORKSHOP COMMENT:

What sources of information were used by the District to calculate estimates for the cost of air pollution control equipment?

DISTRICT RESPONSE:

Cost estimations were calculated using methods published in EPA's OAQPS Control Cost Manual, and in the South Coast Air Quality Management District's Rule 1153 Staff Report. Where differences in the methods occurred, the District chose the higher, more conservative cost estimate.

25. WORKSHOP COMMENT:

A small local bakery which is not part of a nationwide corporation may not be able to put forth $800,000 of initial capital cost for control equipment. If financing is obtained, the term of the loan may be as short as three years, which would cause difficulty in passing on a gradual cost increase.

DISTRICT RESPONSE:

As indicated in the SIA, a company defined as a federal 'SBA small business' can qualify for a seven year loan from the State 'CLEAN' loan program. If a business is too large to qualify as an SBA small business, there are still loan assistance programs available from agencies such as the California Pollution Control Financing Authority (CPCFA) which works with the affected business to determine eligibility on a case-by-case basis.

PC:jo
3/8/94

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

NEW PROPOSED RULE 67.24

RULE 67.24. BAKERY OVENS

(a) APPLICABILITY

Except as provided in Section (b), this rule is applicable to bakery ovens which emit volatile organic compounds (VOC's) during the baking of yeast-leavened products.

Bakery ovens subject to this rule shall not be subject to Rule 66.

(b) EXEMPTIONS

(1) The provisions of this rule shall not apply to bakery ovens which are located at a stationary source where the combined rated heat input capacity of all bakery ovens is less than 2 million British Thermal Units (BTU) per hour.

It shall be the responsibility of any person claiming the exemption in Subsection (b)(1) to provide information necessary for the District to determine the combined rated heat input capacity of all bakery ovens. Such information may include oven or burner manufacturer specifications, or may include fuel or energy consumption rates for oven start-up period(s) in cases where manufacturer specifications are unavailable.

(2) The provisions of this rule shall not apply to ovens used exclusively for the baking of products leavened chemically without yeast.

(3) The provisions of Sections (d) and (g) of this rule shall not apply to bakery ovens which are located at a stationary source where the uncontrolled ~~actual~~ emissions of VOC's from all bakery ovens combined is less than 25 tons per calendar year.

(c) DEFINITIONS

For the purposes of this rule, the following definitions shall apply:

(1) **"Bakery Oven"** means an ~~convection~~ oven which bakes yeast-leavened products, including but not limited to breads, buns, and rolls.

(2) **"Combustion Stack"** means a stack on a bakery oven which emits exclusively combustion exhaust gases which do not pass through the oven's baking chamber.

~~(2)~~ (3) **"Comfort Hood Vent"** means a vent or hood used to control air flow outside the entrance or exit of a bakery oven.

~~(2)(3)~~(4) **"Exempt Compound"** means any of the following compounds or classes of compounds: 1,1,1-trichloroethane, methylene chloride, trichlorofluoromethane (CFC-11),

dichlorodifluoromethane (CFC-12), chlorodifluoromethane (HCFC-22), trifluoromethane (HFC-23), trichlorotrifluoroethane (CFC-113), dichlorotetrafluoroethane (CFC-114), chloropentafluoroethane (CFC-115), dichlorotrifluoroethane (HCFC-123), dichlorofluoroethane (HCFC-141b), tetrafluoroethane (HFC-134 and HFC-134a, both isomers), chlorodifluoroethane (HCFC-142b), chlorotetrafluoroethane (HCFC-124), pentafluoroethane (HFC-125), trifluoroethane (HFC-143a), difluoroethane (HFC-152a); and the following four classes of perfluorocarbon (PFC) compounds:

(i) cyclic, branched, or linear, completely fluorinated alkanes;

(ii) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(iii) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(iv) sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine; ~~.~~

~~and any other compound(s) listed as negligibly reactive by the U.S. Environmental Protection Agency.~~

~~(3)(4)~~(5) **"Fermentation Time"** means the elapsed time between adding yeast to dough or sponge and placing the dough or sponge into ~~an~~ bakery oven, excluding retardation time, expressed in hours.

~~(5)~~ (6) **"Purge Stack"** means a bakery oven stack used exclusively for evacuation of residual gases from the bakery oven during burner ignition.

~~(6)~~ (7) **"Retardation Time"** means any portion(s) of the elapsed time between adding yeast to dough or sponge and placing the dough or sponge into a bakery oven, where the dough or sponge is refrigerated at temperatures of less than 10° C (50° F), for the specific purpose of retarding the fermentation process.

~~(4)(7)~~(8) **"Stationary Source"** means the same as defined in Rule 20.1.

~~means an emission unit or aggregation of emission units, located on the same or contiguous properties. Emission units which are on the same or contiguous property but which are not under the same ownership or entitlement to use and which are not related, shall not be considered a single stationary source. Contiguous property means two or more parcels of land with a common boundary or separated solely by a public or private roadway or other public or private right-of-way.~~

~~(8)~~ (9) **"Uncontrolled VOC Emissions"** means VOC emissions from a bakery oven, before application of add-on air pollution control equipment or process modification.

~~(5)(9)~~ (10) **"Volatile Organic Compound (VOC)"** means any compound of carbon, which may be emitted to the atmosphere during bakery oven operations, except methane,

carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.

~~(6)(10)~~(11) **"Yeast Percentage"** means the pounds of yeast added to a hundred pounds of total flour in the recipe.

(d) **STANDARDS**

(1) No person shall operate a bakery oven subject to this rule, unless uncontrolled VOC emissions are reduced by at least 90 percent by weight. ~~are controlled~~

(2) A person may comply with the requirements of Subsection (d)(1) of this rule by using an air pollution control system which:

(i) has been installed in accordance with an Authority to Construct; and

(ii) includes an emission collection system(s) which ducts the exhaust gases from all stacks, except purge stacks, combustion stacks, and comfort hood vents, on all bakery ovens to a VOC emission control device(s). Such ducting shall be maintained so as to be free of visible holes, breaks, openings or separations between adjoining components from which ~~fugitive~~ VOC's ~~would~~ may be emitted to the atmosphere; and

(iii) has one or more VOC emission control devices, each with reduction efficiency of at least 90 percent by weight.

(3)~~(2)~~ A person subject to the requirements of Subsection (d)(2) ~~(1)~~ shall submit an Operation and Maintenance Plan for the proposed emission control device and emission collection system to the Air Pollution Control Officer for approval, and receive such approval prior to the operation of the control equipment. Thereafter, the plan can be modified, with Air Pollution Control Officer approval, as necessary to ensure compliance. Such plan shall:

(i) identify all key system operating parameters. Key system operating parameters are those necessary to ensure compliance with Subsection (d)(2) ~~(1)~~(iii) such as temperature, pressure, and/or flow rate; and

(ii) include proposed inspection schedules and anticipated ongoing maintenance regarding the key system operating parameters.

(4)~~(3)~~ A person subject to the requirements of Subsection (d)(3) ~~(2)~~ shall implement the plan upon approval of the Air Pollution Control Officer, and shall comply with the provisions of the approved plan thereafter.

(e) **RECORDKEEPING**

After (*six months after date of adoption*), ~~A~~ a person operating a bakery oven(s) subject to this rule shall maintain records in accordance with the following:

(1) Maintain current records necessary to determine VOC emissions for ~~each~~ all bakery ovens including, but not limited to, type of each yeast-leavened baked product, yeast percentage for each product, and fermentation time for each product; and

(2) Maintain ~~monthly~~ annual records based on calendar year of production rates, by weight, of finished baked product for each yeast-leavened product.

(3) A person operating ~~For~~ air pollution control equipment subject to Subsection (d)(2) shall maintain records sufficient to determine continuous daily compliance, such as daily records of key system operating parameters specified in Subsection (d)(3) ~~(2)~~(i).

Records maintained in accordance with Subsection (e)(2) are subject to District verification after 60 days following the end of a calendar year. These records shall be maintained on site for at least three years and shall be made available to the District upon request.

(f) TEST METHODS

(1) For the purposes of this rule, VOC emission factors for each yeast-leavened bakery product shall be determined in accordance with ~~Table 67.24~~ Table 67.24 and the following formula:

$$EF = 0.95\ Y_i + 0.19\ t_i - 0.51S - 0.86\ t_s + 1.90$$

where Y_i = initial yeast percentage

t_i = total fermentation time

S = second (spiking) yeast percentage, if applicable

t_s = fermentation time for second yeast percentage, if applicable, and

EF = emission factor, pounds of VOC emissions per ton of baked product

Annual uncontrolled emission rates shall be calculated by using ~~those~~ emission factors and the annual production rate for each yeast-leavened finished bakery product. The highest of the two calculated emission rates for a stationary source shall be used for the purposes of this rule. In cases where annual emissions ~~determined~~ for a stationary source, as determined using the highest emission rate, exceeds 80 percent of the annual emissions specified in Subsection (b)(3), or other cases as deemed appropriate by the Air Pollution Control Officer, emission factors shall instead be determined in accordance with Subsection (f)(2).

(2) ~~Alternatively,~~ VOC emission factors for ~~any~~ yeast-leavened bakery products may be determined by ~~the method(s) specified in Subsection (f)(2)~~ EPA Methods 18, 25, and/or 25A (40 CFR 60) as they exist on (*date of adoption*), together with exhaust flow rates and oven throughputs ~~using a test~~. Test procedures shall be performed in accordance with a protocol approved by the Air Pollution Control Officer. An alternative test method

may be used provided such method has been approved, in advance, by the Air Pollution Control Officer, ARB and EPA. ~~For purposes of federal enforcement of this rule, the U.S. Environmental Protection Agency is not subject to approval of test protocols by the Air Pollution Control Officer.~~

(3)~~(2)~~ Measurement of ~~VOC~~ emission control device reduction efficiency subject to Subsection (d)(2) ~~(1)~~(iii) of this rule shall be conducted in accordance with EPA Methods 18, 25, and/or 25A (40 CFR 60) as they exist on (*date of adoption*), ~~using a test~~ Test procedures shall be performed in accordance with a protocol approved by the Air Pollution Control Officer. ~~For purposes of federal enforcement of this rule, the U.S. Environmental Protection Agency is not subject to approval of test protocols by the Air Pollution Control Officer.~~

(g) COMPLIANCE SCHEDULE

A person operating a bakery oven(s) subject to Subsection (d)(2) of this rule shall meet the following increments of progress:

(1) For an oven which commenced operation prior to (*date of adoption*), or for a replacement of such an oven:

(i) By (*twelve months after date of adoption*), submit to the Air Pollution Control Officer any necessary application for Authority to Construct and Permit to Operate an air pollution control system meeting the requirements of Subsection (d)(2) ~~(1)~~;

~~(ii) By (*twenty-one months after date of adoption*), issue purchase orders for the basic control device and other long-delivery time components necessary to comply with Subsection (d)(1);~~

~~(iii)~~ (ii) By (*thirty-six months after date of adoption*), demonstrate compliance with Subsection (d)(1).

(2) For an oven which commences operation on or after (*date of adoption*), be in compliance with Subsection (d)(1) by the date of commencement of oven operation.

(3) For an existing stationary source having a calculated annual emission rate pursuant to Subsection (f)(1) exceeding 80 percent of the emission rate specified in Subsection (b)(3), by (*two months after date of adoption*), submit to the Air Pollution Control Officer for approval a plan for emissions testing pursuant to Subsection (f)(2). Such plan shall provide for emissions testing to be completed, and test report(s) submitted, by (*six months after date of adoption*).

Stationary sources electing to comply with Subsections (d)(2) and (g)(1) shall not be subject to Subsection (g)(3).

TABLE 67.24

Yt*	Emission Factor**	Yt*	Emission Factor**	Yt*	Emission Factor**
1.0	0.8488	11.0	5.2947	21.0	9.7405
1.5	1.0711	11.5	5.5170	21.5	9.9628
2.0	1.2934	12.0	5.7393	22.0	10.1851
2.5	1.5157	12.5	5.9616	22.5	10.4074
3.0	1.7380	13.0	6.1839	23.0	10.6297
3.5	1.9603	13.5	6.4061	23.5	10.8520
4.0	2.1826	14.0	6.6284	24.0	11.0743
4.5	2.4049	14.5	6.8507	24.5	11.2966
5.0	2.6272	15.0	7.0730	25.0	11.5189
5.5	2.8495	15.5	7.2953	25.5	11.7412
6.0	3.0718	16.0	7.5176	26.0	11.9635
6.5	3.2941	16.5	7.7399	26.5	12.1857
7.0	3.5163	17.0	7.9622	27.0	12.4080
7.5	3.7386	17.5	8.1845	27.5	12.6303
8.0	3.9609	18.0	8.4068	28.0	12.8526
8.5	4.1832	18.5	8.6291	28.5	13.0749
9.0	4.4055	19.0	8.8514	29.0	13.2972
9.5	4.6278	19.5	9.0737	29.5	13.5195
10.0	4.8501	20.0	9.2959	30.0	13.7418
10.5	5.0724	20.5	9.5182		

*Yt = (Yeast Percentage) x (Fermentation Time)

If yeast is added in two steps,
Yt = (percentage of initial yeast addition) x (time from initial yeast addition to placement in oven)
+ (percentage of second yeast addition) x (time from second yeast addition to placement in oven)

** Emission Factor = pounds of VOC per ton of finished baked product