GUIDANCE DOCUMENT FOR CORRECTING COMMON VOC & OTHER RULE DEFICIENCIES

(A.K.A., The Little Bluebook)

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IX

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Introduction

This document, sometimes referred to as the Little Bluebook, is intended to help state and local air agencies develop rules that meet federal criteria for incorporation into State Implementation Plans (SIPs). It was originally developed for stationary source VOC rules, but much of the discussion also applies to other rules. It does not impose new requirements but provides examples and additional explanation of issues highlighted in EPA's guidance document, *Issues Relating to VOC Regulation Cutpoints, Deficiencies, and Deviations - Clarification to Appendix D of November 24, 1987 Federal Register* (OAQPS, May 25, 1988, referred to as the Bluebook). The Bluebook can be found at http://www.epa.gov/oar/oaqps/ozonetech/voc_bluebook.pdf.

Please note, neither the Bluebook nor the Little Bluebook represent exhaustive listings of all potentially applicable requirements for SIP rules. The lists of national guidance, for example, do not include all potentially relevant information.

For questions or comments on this document, please contact:

Rulemaking Office (AIR-4)
Air Division
U.S. EPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105
(415) 744-1185

VOC Definition

EPA regulates emissions of all volatile organic compounds (VOC) except those with negligible photochemical reactivity.

National Regulation/Policy/Guidance

EPA defines VOC at 40 CFR 51.100(s) and lists those negligibly reactive compounds which are exempt from VOC requirements. EPA occasionally updates this list based on new information.

Suggestions for Developing Approvable Provisions

1. Most SIPs either reference 40 CFR 51.100(s) or reprint it in its entirety.

2. SIP rules cannot use vapor pressure to define VOC.

3. SIP rules cannot exclude compounds that are not exempted by 40 CFR 51.100(s).

4. SIP rules can control compounds that are exempted by 40 CFR 51.100(s) as long as states do not claim control of these compounds as emission reductions in ozone SIPs, as credits for New Source Review or Economic Incentive Programs, or for determining compliance with emission limits.

Example Approvable Provision

40 CFR 51.100(s) exempts ethane, but California considers ethane reactive. Consistent with item #4 above, EPA has approved California VOC definitions which do not exempt ethane.

Rule Applicability and Exemptions

National Regulation/Policy/Guidance

1. Rule applicability must be clear to meet the general enforceability requirement of §110(a)(2)(A).

2. §§182(a)(2) and (f) require RACT in nonattainment areas for all major sources of VOC and NOx and all sources that meet the applicability requirements of a CTG.

3. The Bluebook describes a 5% equivalency rule that allows rule applicability that varies slightly from the presumptive RACT. http://www.epa.gov/oar/oaqps/ozonetech/voc_bluebook.pdf.

4. CTGs and other EPA policy documents have further guidance on specific source categories. For example, *Exemption for Low-Use Coatings*, signed by G.T. Helms on August 10, 1990, allows exemption of up to 55 gallons/year of high-VOC coatings. http://www.epa.gov/oar/oaqps/ozonetech/luc_memo.pdf.

5. *State Implementation Plans: Policy Regarding Excess Emissions During Malfunctions, Startup, and Shutdown*, memo from Steven Herman (OECA) and Robert Perciasepe (OAR), EPA, September 20, 1999. http://www.epa.gov/ttncaaa1/t1/meta/m12554.html.

Suggestions for Developing Approvable Provisions

1. Rules affecting major sources in nonattainment areas generally cannot exempt activities subject to relevant CTGs or other presumptive RACT without demonstrating compliance with the 5% equivalency rule.

2. Exemptions for activities subject to other federal requirements (e.g., RACM) should be accompanied by a demonstration that the federal requirement has been met.

3. Waivers or exemptions from requirements during startup, shutdown, malfunction and related conditions must comply with EPA s September 1999 policy on excess emissions.

Example Provisions Needing Support Demonstration

1. *For purposes of this rule, organic liquid loading facilities are those facilities which load more than 20,000 gallons/day of organic liquids with a true vapor pressure of at least 1.5 psia at loading conditions.*

EPA's CTG for Bulk Gasoline Plants exempts facilities which load less than 4,000 gallons/day. The example exemption level of 20,000 is not approvable in nonattainment areas without demonstrating compliance with the 5% equivalency rule.

2. *Paragraph (b)(1) shall not apply to coatings with separate formulations that are used in volumes of less than 20 gallons per year provided that the total usage by a facility is less than 200 gallons of such formulations applied annually.*

EPA recognizes exemptions of 55 gallons/year total of high VOC coating (e.g., G.T. Helms August 10, 1990 memo). The above provision, in contrast, exempts up to 200 gallons/year and is not approvable in nonattainment areas without demonstrating compliance with the 5% equivalency rule.

Coating and Ink VOC Content Units

The units for limits on VOC content of coatings and inks must be clear and enforceable.

National Regulation/Policy/Guidance

1. The Bluebook. http://www.epa.gov/oar/oaqps/ozonetech/voc_bluebook.pdf.

2. *A Guideline to Surface Coating Calculations*, EPA-340/1-86-016, July 1986. http://www.epa.gov/oar/oaqps/ozonetech/guide_sco.pdf.

3. *A Guideline for Graphic Arts Calculations*, EPA-340/1-88-004, June 1988. http://www.epa.gov/clariton/clhtml/pubtitle.html.

4. *Model VOC Rules for RACT (staff working document),* EPA/OAQPS, June 1992. http://www.epa.gov/oar/oaqps/ozonetech/voc_modelrules.pdf.

Suggestions for Developing Approvable Provisions

1. Coating VOC content limits are generally expressed in units of weight of VOC per volume of coating, less water and exempt compounds, as applied. Many ink and adhesive VOC limits are also expressed this way.

2. Solids-based units (e.g., weight VOC per volume solids) are also often appropriate (e.g., when add-on control is a compliance option), and generally must be used when allowing compliance with VOC limits by averaging. Weight VOC per weight solids units may also be appropriate for some coatings and graphic arts operations. (See reference 3.)

3. Weight VOC per volume material, without subtracting water and exempts, can be used for limits on materials without solids, like clean-up solvents and lithographic fountain solutions. Alternative units for low-solids coatings (e.g., less than 10% by weight of the material is solids), however, should be evaluated on a case-by-case basis.

Example Approvable Equations

1. *VOC content of coatings less water and exempt compounds, as applied, shall be determined using the test methods in paragraph X and calculated as follows:*

VOC Content = *where:*

Dc = density of coating.
Wv = weight fraction volatile content of coating.
Ww = weight fraction water.
Wei = weight fraction exempt solvent i.
Dw = density of water.
Dei = density of exempt solvent i.

2. *VOC content of coatings less water and exempt compounds, as applied, shall be determined using the test methods in paragraph X and calculated as follows:*

VOC Content = (Ws - Ww - Wec)/(Vm - Vw - Vec), where

Ws = grams of all volatile compounds evolved during analysis.
Ww = grams of water evolved during analysis.
Wec = grams of exempt compounds evolved during analysis.
Vm = liters of coating and/or ink, including any thinners and diluents applied.
Vw = liters of water evolved during analysis.
Vec = liters of exempt compounds evolved during analysis.

3. Other equations must be used for determining compliance with VOC content limits by averaging or with limits using other units (e.g., solids-based limits).

Compliance Periods and Averaging Times

All SIP requirements are associated with one or more compliance time frames. For example:

1. Some facilities are limited in the pounds of pollutant they may emit per hour and the hours they may operate per year.

2. Certain information must be recorded once an hour and maintained for five years.

3. Some compliance tests must be performed at least once every year.

National Regulation/Policy/Guidance

1. *Averaging Times for Compliance with VOC Emission Limits - SIP Revision Policy*, memo from John R. O'Connor, EPA/OAQPS, January 20, 1984, published as Appendix D of EPA s Emissions Trading Policy Statement, 51 FR 43857, December 4, 1986.

2. 40 CFR 51, Subpart U - Economic Incentive Programs, 59 FR 16690, April 7, 1994.

3. *Improving Air Quality with Economic Incentive Programs*, EPA-452/R-01-001, January 2001. http://www.epa.gov/ttncaaa1/t1/meta/m1201.html.

4. Compliance periods and averaging times should not interfere with the enforceability of emission limits as required in §110(a)(2)(A).

Suggestions for Developing Approvable Provisions

1. Compliance time frames should be clearly specified. Where they are not, such as many emission rate limits (e.g., ppmv) and VOC content limits (e.g., lb/gal), EPA assumes instantaneous and continuous compliance is required.

2. Rule compliance periods generally must be consistent with the applicable NAAQS time frame. Since the ozone NAAQS is based on one-hour levels recorded over 24-hours, for example, VOC requirements should have daily or shorter compliance periods.

3. Provisions that allow compliance demonstration by averaging a series of measurements over time should clearly specify:
   a. The frequency of measurements.
   b. Whether averages are arithmetic or weighted.
   c. Whether averages are calculated on a calender (e.g., daily average examines each day, midnight to midnight) or rolling (e.g., midnight to midnight, 1am to 1am, 2am to 2am, etc.) basis.

4. As described in the 1984 O Connor memo, VOC emission limitations with averaging longer than 24-hours may be permitted under the following conditions:
   a. Daily limits are infeasible.
   b. Actual emissions (based on historical data) are consistent with relevant RACT/BACT control levels.
   c. Averaging is no longer than 30 days.
   d. Averaging will not jeopardize attainment or RFP requirements. Agencies must demonstrate that the maximum daily emission increase caused by the averaging is consistent with the area s approved ozone SIP. Nonattainment areas without approved SIPs cannot be considered for long term averages.

5. Longer than 24-hour averaging in economic incentive programs generally must comply with 40 CFR 51 Subpart U, including:
   a. 10% or other environmental benefit (51.493(a)(1)).
   b. A statistical showing that the averaging is consistent with the NAAQS and RFP (51.493(d)(2)(ii)).
   c. A statistical showing that the averaging is equivalent on a daily basis to source-specific RACT requirements (51.493(d)(2)(ii)).
   d. A demonstration that the enforcement mechanisms for averaging provide equivalent incentives for compliance (51.493(i)(1)(i)).
   e. Other EIP requirements.

Alternative Controls and Alternative Methods of Compliance

Some regulations allow alternative methods for meeting emission limits including - equivalency provisions, alternative emission control plans (AECPs) and cross-line averaging. Variances are another alternative method of compliance that must meet additional administrative requirements.

National Regulation/Policy/Guidance

1. 40 CFR 51 Subpart U describes Economic Incentive Program (EIP) requirements.

2. *Improving Air Quality with Economic Incentive Programs*, EPA-452/R-01-001, January 2001. http://www.epa.gov/ttncaaa1/t1/meta/m1201.html.

3. Industry-specific national guidance that describes averaging provisions, such as *Compliance with VOC Emission Limitation for Can Coating Operations* (45 FR 80824, December 8, 1980) and several CTGs, generally takes precedence over the generic EIP guidance in items 1 & 2 above. Such industry-specific guidance should not, however, be used to develop averaging provisions in SIP rules for other industries.

Suggestions for Developing Approvable Provisions

1. Provisions that allow alternative compliance with emission limits by providing equivalent or greater emission reductions through control equipment or other methods must clearly and completely specify the test methods, calculations and any other methodology needed to demonstrate equivalence, including capture efficiency where appropriate.

2. AECPs (a.k.a., equivalency, compensating reduction or bubble) and economic incentive (e.g., emission trading) programs allow over-compliance at one operation to offset under-compliance at another. These provisions generally should comply with 40 CFR 51 Subpart U. Common deficiencies include director s discretion, averaging beyond 24-hours, incomplete methodology for determining equivalency (e.g., no emission quantification protocols), and lack of 10% or other environmental benefit.

3. To protect sources from potential federal enforcement for violating the SIP, variances (a.k.a., variance order, waiver, or conditional permit) temporarily suspending SIP requirements can be submitted for action by EPA as source specific SIP revisions. Such submittals must demonstrate that the variance meets all relevant CAA requirements. State/local agencies should contact EPA before submitting variances or variance rules for inclusion into the SIP.

Example Approvable Provisions

1. *A person shall not apply any coating with a VOC content in excess of the specified limits unless emissions to the atmosphere are controlled to an equivalent level by air pollution abatement equipment with a combined capture and control efficiency of 80 percent or greater. Calculations, test methods and recordkeeping shall be performed as prescribed in Section X.*

2. *The requirements of Section Y shall not apply to any coating line which complies with the following requirements:*
   a. *Emissions of VOCs, determined using a daily weighted average, shall not exceed the amount which would result if the coating line complied with all VOC content limits of this rule.*
   b. *In order for two or more coatings to qualify for inclusion in a daily weighted average calculation, the coatings must be used on the same coating line and/or operation, and the coatings must be regulated under the same emission limit (e.g., both adhesive primers subject to 3.5 lbs VOC/gal material), and the coatings must be applied on the same day.*
   c. *Calculations, test methods and recordkeeping shall be performed as prescribed in Section X.*

Recordkeeping

Recordkeeping requirements must be sufficient to assure continual compliance with VOC content limits, fuel specifications, rule applicability, exemption levels, emission caps, and other operating and emission requirements.

National Regulation/Policy/Guidance

1. The Bluebook. http://www.epa.gov/oar/oaqps/ozonetech/voc_bluebook.pdf.

2. *Recordkeeping Guidance Document for Surface Coating Operations and the Graphics Arts Industry*, EPA 340/1-88-003, July 1989. http://www.epa.gov/oar/oaqps/ozonetech/sco_ga.pdf.

3. *Exemption for Low-Use Coatings*, memo from G.T. Helms, EPA, August 10, 1990. http://www.epa.gov/oar/oaqps/ozonetech/luc_memo.pdf.

4. 40 CFR 70.6(a)(3) and (c)(1) require periodic monitoring in Title V permits.

Suggestions for Developing Approvable Provisions

1. Recordkeeping requirements should be clear, explicit and independently enforceable. Where a daily log is needed, for example, rules both should explicitly require the log and should specify the frequency and units of each parameter to be recorded.

2. Recordkeeping time frames and units should be consistent with operating and emission requirements. Hourly BTU limits, for example, generally must be supported by hourly BTU records.

3. While continuous recordkeeping is required of some activities (e.g., power plant emissions), no less frequent than daily records are generally needed to support the Clean Air Act provision for daily violations. In the few cases where EPA has allowed less frequent (e.g., weekly) recordkeeping, rules should specify that violations of the weekly requirement are presumed to be separate violations for each day within the week.

4. Rules that establish VOC content limits on materials (e.g., coatings), but do not establish emission or use caps, can allow monthly recordkeeping for sources using only compliant materials. Compliance with VOC content limits by averaging or trading, however, must be supported by daily or more frequent recordkeeping. Compliance by add-on control equipment must be supported by recordkeeping appropriate to the specific equipment, which generally includes hourly or daily records of key operating parameters. VOC content records should be required to include all thinners, solvents and other additives as applied.

5. EPA has approved some coating rules that do not specify recordkeeping associated with the general CTG size cutoff that applies CTG requirements only to sources with total VOC emissions greater than 10 ton/year potential or 15 lb/day and 3 lb/hr actual. In general, however, small sources should maintain records sufficient to demonstrate that they have not exceeded this applicability threshold.

6. Daily or as-used (recording use each day material is used) records are required for sources that are larger than the general CTG size cutoff, but that comply with a 55 gal/year or other non-compliant material exemption.

7. SIP rules should require that all records be maintained for at least 2 years. Note that Title V permits and MACT standards require 5 year record maintenance.

Test Methods

SIP rules must specify all sampling and analysis methods needed to determine compliance with the rule.

National Regulation/Policy/Guidance

Rules must specify test methods to meet the general enforceability requirement of §110(a)(2)(A).

Suggestions for Developing Approvable Provisions

1. As appropriate, SIP rules can reference or reprint EPA air test methods located in:
   40 CFR Part 51, Appendix M (SIP methods).
   40 CFR Part 60, Appendix A (EPA Reference Methods).
   40 CFR Part 60, Material Approved for Incorporation by Reference (ASTM methods). Only those specific ASTM methods which appear in 40 CFR 60 are approved for use in SIPs.
   40 CFR Part 61, Appendix B (HAP methods).
   40 CFR Part 63, Appendix A (MACT methods).

2. EPA methods used in other media, such as SW-846 for solid waste, are not automatically approved for air pollution applications.

3. All other test methods must be evaluated and approved by EPA before a rule containing the test method can be approved into the SIP. Region IX maintains a list of California methods that have been approved for SIPs. Submittal of test methods for EPA approval should include the information and follow the procedure described in Region IX's "Test Method Review & Evaluation Process. EPA has approved SIP rules that refer to specific ASTM methods that are not directly tied to criteria pollutant emissions (e.g., gloss of paints) without full method evaluation.

4. References to EPA-approved ASTM methods should include the full title and date of the version being specified.

5. References to EPA-approved state or local methods should include the full title but may or may not specify the date of the version.

6. If a SIP rule lists more than one EPA-approved test method for determining compliance, the rule must also state that a violation determined by either test method shall constitute a violation of the rule.

Transfer Efficiency (TE)

Transfer efficiency requirements are included in some coating regulations and can be defined as the following ratio:

Generally, total coating use and VOC emissions decrease as TE increases.

National Regulation/Policy/Guidance

1. *A Guideline for Surface Coating Calculations* (EPA-340/1-86-016, July 1986) contains sample TE calculations. http://www.epa.gov/oar/oaqps/ozonetech/guide_sco.pdf.

2. Past efforts such as TE tables in several NSPS (e.g., 40 CFR 60 Subpart EE) attempted to assign generic TE values to coating application methods. Changes in operating parameters significantly affect TE, however, and the generic values were rarely meaningful because of the variety of substrate shape, size and other real-world operating conditions. As a result, TE test protocols generally must be custom designed and consider all parameters of specific operations.

3. Http://www.epa.gov/etv/04/04_main.htm summarizes TE research on some specific coating equipment. This information should not be used to show compliance with specific TE requirements, but may help determine relative efficiency of different equipment.

Suggestions for Developing Approvable Provisions

1. Many rules specify acceptable coating methods rather than a TE requirement.

2. SIP rules can specify TE values for alternative coating methods if test protocols to verify TE are approved by EPA. Two generic EPA-approved TE protocols are Spray Equipment Transfer Efficiency Test Procedure for Equipment Users (South Coast Air Quality Management District, 5/24/89), and a protocol described in the Automobile Topcoat Protocol Document (EPA-450/3-88-018). EPA was able to develop the latter protocol because TE is relatively stable at automobile assembly plants where identical items are continuously coated with automated equipment and few kinds of coatings.

3. ASTM methods which address TE and may be useful in developing source-specific TE protocols include:

    a. D5286-95 Standard Test Methods for Determination of Transfer Efficiency Under General Production Conditions for Spray Application of Paints.

b. D5327-97 Standard Practice for Evaluating and Comparing Transfer Efficiency Under General Laboratory Conditions.
c. D5066-91(1996) Standard Test Method for Determination of the Transfer Efficiency Under Production Conditions for Spray Application of Automotive Paints-Weight Basis.
d. D5009-96 Standard Test Method for Evaluating and Comparing Transfer Efficiency of Spray Applied Coatings Under Laboratory Conditions.

Capture Efficiency

Capture efficiency is the fraction of emissions generated by a process that is directed to a control device.

National Regulation/Policy/Guidance

1. *Guidelines for Determining Capture Efficiency* (January 9, 1995), incorporated in an EPA memo signed by John Seitz titled, Revised Capture Efficiency Guidance for Control of Volatile Organic Compound Emissions (February 7, 1995). http://www.epa.gov/ttncaaa1/t1/meta/m28508.html.

2. Rules that reference older capture efficiency guidance (e.g., 40 CFR 52.741 or 55 FR 26865 of June 29, 1990) should be updated. The 1995 guidance corrects errors in earlier guidance and provides greater flexibility in meeting test requirements.

Suggestions for Developing Approvable Provisions

1. Both capture efficiency and control device efficiency (or emission limit) must be specified when regulating emissions with add-on control equipment.

2. Rules must specify both the test methods and the calculation procedures to be used to determine capture efficiency. Reference to 40 CFR 51 Appendix M, which contains relevant EPA test methods, is not sufficient without also describing calculation procedures or referencing EPA s 1995 guidance.

3. Rules may specify a single combined capture and destruction efficiency if the methods for determining it are clear.

4. SIP submittals should describe how capture and control requirements were established.

Example Approvable Provision

Sources must install and operate an emissions control system designed and operated to capture at least 90% of all VOC emissions from affected units and to direct them to a control device designed and operated at 90% destruction efficiency or greater.

Capture efficiency shall be determined according to US EPA s Guidelines for Determining Capture Efficiency, (January 9, 1995) and 40 CFR 51, Appendix M, Methods 204-204F as applicable.

Destruction efficiency shall be determined by 40 CFR 60, Appendix A, Methods 18, 25 or 25A.

Director's Discretion

Director's Discretion allows the state to approve alternatives to the applicable SIP without following the SIP-revision process described in §110. Inappropriate Director s Discretion has appeared in a wide variety of state rule provisions including those regarding applicability, emission limits, operating requirements, recordkeeping, monitoring, test methods and alternative compliance.

National Regulation/Policy/Guidance

1. §110(a)(2)(A) requires that SIP regulations are enforceable.

2. 52 FR 45109 (November 24, 1987) states EPA s general policy regarding director s discretion.

Suggestions for Developing Approvable Provisions

1. Director s Discretion may be appropriate if explicit and replicable procedures within the rule tightly define how the discretion will be exercised to assure equivalent emission reductions.

2. Director s Discretion may be appropriate for provisions that do not fulfill or support any federal SIP requirement.

3. Director s Discretion may be appropriate if each exercise of discretion is approved by EPA.

Example Approvable Provisions

1. Inclusion of replicable procedures. In many cases, such provisions do not need to require the Director s approval, particularly those such as example (b) below where the rule provides clear discrete compliance choices.

a. *A person shall not use any coating with a VOC content in excess of the limits in Section E unless all coating emissions from the facility are controlled by air pollution abatement equipment which has been approved in writing by the APCO and which has an overall control efficiency of at least 85%. Overall control efficiency shall be determined according to Section F.*

Test methods and the 85% standard provide the replicable procedure. Note that the SIP submittal to EPA must demonstrate that 85% is equivalent to the emission limits.

b. *For cold cleaning, one of the these devices approved by the APCO must be used:*
(i) a freeboard with a freeboard ratio equal to or greater than 0.75, or
(ii) a water cover if the solvent is insoluble and heavier than water.

2. Discretion for provisions that do not fulfill or support any federal SIP requirement.

Some dry cleaning rules regulate both perchloroethylene and petroleum solvent processes. Directors Discretion for perchloroethylene provisions could be approved into the SIP since EPA considers perchloroethylene an exempt VOC and does not require its control in the SIP. Note that such discretion may cause other problems, if the perchloroethylene provisions are intended to implement §112 MACT standards.

3. Discretion approved by EPA.

This Section shall not apply to any person who complies with an alternate recordkeeping plan that provides for an enforceable daily record which has been submitted to and approved by the APCO, ARB and EPA.