

ILLINOIS POLLUTION CONTROL BOARD  
May 30, 1985

IN THE MATTER OF: )  
 )  
VOLATILE ORGANIC MATERIAL ) R82-14  
EMISSIONS FROM STATIONARY ) Dockets A & B  
SOURCES: RACT III )

PROPOSED ORDER:            FIRST NOTICE. .

OPINION AND ORDER OF THE BOARD (by B. Forcade):

On June 14 and August 10, 1984, the Board adopted first notice orders, and on August 22, 1984, an accompanying opinion proposing amendments and new rules for the control of volatile organic emissions from five industrial categories. One of these categories, heatset web offset lithographic printing, has been the subject of great confusion and controversy. At first notice, the Board proposed rules that contained elements of the original Illinois Environmental Protection Agency ("Agency") proposal, as well as a draft version submitted by the heatset web offset printing industry ("Industry"). Public comments received during first notice cited many problems with the proposed rule (P.C. 54, 57 & 62).

It is apparent, upon review of the record and comments, that the rule proposed at first notice needs substantial revision. It is also apparent that the current record for this category is inadequate to develop satisfactory language and consequently needs to be supplemented. Therefore, the Board in its second notice opinion and order dated today, withdraws the heatset web offset rules in their present form. The instant opinion and order proposes new draft rules for the purpose of generating comments and criticisms. The record, as it exists today, does not adequately support certain aspects of these new proposed rules. The Board is not advocating this proposed language but is using this second first notice opinion and order as a vehicle for reopening the record in this category and outlining the unresolved issues.

The Board's first notice rule presented today is based on the now "terminated" draft CTG for this category (Ex. 24o). While the effect of this "termination," by letter dated March 22, 1982, from USEPA Deputy Administrator John Hernandez is somewhat ambiguous, the draft CTG document is still useful as a source of

information and general guidance.\* The new language will provide a starting point to develop an achievable and reasonable rule. Consequently, a new hearing will be scheduled for this category in order to supplement the existing record.

Before a discussion of the problems associated with the Board's proposed rule can proceed, it is necessary to review the potential volatile organic material ("VOM") emission sources from the heatset web offset printing process (a more detailed description is found on pp. 11-17 of the Board's August 22, 1984, Opinion). The two major sources of VOM are from the fountain solution, which can contain between 15 to 25 percent isopropyl alcohol and the ink solvents. It should be noted that Industry contends that the ink solvent used in their process are exempt from control under Subpart K, given the current definition of photochemically reactive materials. In support of this argument, Industry presented three parts of a five part study underway at Battelle concerning the reactivity of the ink solvents used in heatset web offset printing (Exs. 22, 39 & P.C. 54).

The only evidence presented by the Agency in support of their position that ink solvent emissions should be controlled as ozone precursors is a series of letters and memos by the U.S. Environmental Protection Agency ("USEPA") which conclude that ink solvents are reactive (Ex. 24 a and b). The draft CTG also calls for the control of ink oil emissions (Ex. 29e). The Agency contends that these compounds should be controlled because they are released into the atmosphere as vapors as a result of being heated in dryers during the printing process (P.C. 57). At normal temperature and pressure they are not volatile. The completed portions of the Battelle study indicate that even as vapors, representative ink solvents are about as reactive as or slightly less reactive than ethane, a compound adjudged non-reactive by USEPA (Exs. 22, 39, P.C. 54).

Volatile isopropyl alcohol emissions are predominantly released from press units and dryers. The draft CTG estimates that 50 percent of emissions are released in the pressroom and 50 percent are released through the dryer exhaust (Ex. 29e, & Section 4.1). Ink solvent vapors are emitted primarily from the dryer (approximately 80 percent) and to a lesser extent from the cooling roller process. Various control options include: 1) reduction or elimination of isopropyl alcohol in the fountain solution; 2) use of direct flame or catalytic afterburners on the dryer exhaust (a process that oxidizes both isopropyl alcohol and ink solvent emissions); 3) use of a condensor system on the dryer

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\*The ambiguity regarding whether this category is still "covered" by a CTG or not is compounded by a public comment from USEPA received after first notice. P.C. 60, dated October 22, 1984, implies that heatset web offset is still within the CTG program and that rules are still required for this category.

exhaust (a process that selectively controls ink solvent emissions but not isopropyl alcohol); and 4) reformulation of printing inks to high solid/low solvent mix. The economic reasonableness, practicality and availability of these various options are subject to debate. Additionally, the factual determination of whether or not ink solvents are photochemically reactive will affect which control option or combination of options should be implemented.

The draft CTG outlines what USEPA considers RACT for this industrial category (Ex. 29e). Section 4.1 states that:

"A reduction in VOC emissions to 0.3 kilograms per kilogram of ink consumed is considered representative of reasonably available control technology (RACT) for full-web process-color heatset web-offset lithographic printing presses. This emission limit is based on elimination of high volatility organic compounds from the fountain solutions; however, it could also be achieved through the use of other control techniques. Incineration of the exhaust gases discharged from the dryer and reduction in the concentration of high volatility organic compounds in the fountain solutions to 12 percent or less by weight, or condensation of ink solvent from the exhaust gases discharged from the dryer and reduction in the concentration of high volatility organic compounds in the fountain solutions to 7 percent or less by weight, for example, could also achieve this reduction in VOC emissions."

The CTG describes three basic alternative control strategies to achieve RACT: 1) Total elimination of VOM's in the fountain solution; or 2) Reduction of VOM concentration to 12 percent and incineration; or 3) Reduction of VOM concentration to 7 percent and condensation of ink solvents. No version of the rule, whether proposed by the Board, Agency or Industry, is consistent with the draft CTG's definition of RACT. This infirmity alone, would not be fatal if there existed an adequate record to support any of these versions. However, no present version of the rule is totally supported in the record.

The Board's rule proposed at first notice in August, 1984, applies to facilities whose emissions of VOM exceed 25 tons per year. The rule requires one of three options: 1) installation of an afterburner system which oxidizes 90 percent of captured non-methane VOM (no capture efficiency is provided); or 2) reduction of VOM concentration in the fountain solution to no more than five percent and installation of a condensation recovery system which removes at least 75 percent of VOM's from the airstream or reformulation of the ink to a high solid/low solvent; or 3) an alternative control system demonstrated to have an equivalent emission reduction efficiency equal to either of

the first two control options.

The Board's original proposed rule presents a number of conceptual problems. First, the Board rule only attempts to control volatile organic material emission yet controls ink solvents which do not fall within the current definition of VOM. The ink solvents are in fact non-volatile organic material which are vaporized through a drying process. This is a separate issue than whether or not they are ozone precursors. Second, the Board's August 22, 1984, Opinion appears to view the findings of the Battelle study favorably, finds a paucity of evidence supporting the Agency's position and yet provides for controls of ink solvent emissions. While this issue may never be resolved to all parties' satisfaction, it is necessary to make a choice and implement the logical extensions of that choice. Third, the alternative control strategies are not equivalent. The first alternative, an afterburner system on the dryer exhaust, leaves pressroom emissions totally uncontrolled while controlling most ink solvent and isopropyl alcohol dryer emissions. The second alternative requires reduction of VOM in the fountain solution combined with one of two alternate approaches for controlling ink solvent emissions. These ink solvent control approaches are very difficult to compare, and do not seem well supported in the record.

Additional concerns with the Board's proposed rule were raised by public commenters. Industry challenged the feasibility of reducing VOM in the fountain solution to 5 percent while still maintaining acceptable print quality (P.C. 62). The use of non-VOM isopropyl alcohol substitutes, which the Board presumed to be available, was also questioned. While substitutes do exist, all but ethylene glycol are VOM's themselves. Ethylene glycol can only be used satisfactorily in one of the three commonly used dampening processes (P.C. 62). The Agency pointed out that no capture efficiency was designated for the afterburner system, rendering the 90 percent oxidation requirement meaningless (P.C. 57). The Agency also pointed out that the 75 percent recovery efficiency for VOM for the condensation system does not differentiate between VOM from the fountain solution and organic emissions from the ink solvents. Condensation systems are not designed to recover isopropyl alcohol in an economical fashion (P.C. 57).

Neither the Agency's proposed language nor Industry's draft rule are consistent with the draft CTG definition of RACT. The Agency draft rule requires: 1) use of an afterburner system that oxidizes at least 90 percent of organic materials; or 2) the fountain solution contain no more than 5 percent VOM and use of a condensation recovery system that removes 75 percent of the organic materials in the air stream; or 3) an alternative emission control system demonstrated to be equivalent to either of the first two alternatives. This rule suffers from similar problems as does the Board's proposed rule as it fails to combine reduction of VOM concentration in the fountain solution with

condensation or oxidation. It also controls the non-VOM ink solvents, an issue yet to be resolved. Industry's draft rule requires: 1) use of an afterburner system which oxidizes 90 percent of captured VOM; or 2) reformulation of the fountain solution to no more than 8 percent VOM; or 3) an alternative emission control system demonstrated to be equivalent to either of the first two alternatives. This rule is consistent with Industry's position that only VOM's and not ink solvents should be controlled.

Industry also submitted the third task of the ongoing Battelle study as P.C. 54. This task tested used ink solvents to see if the photochemical reactivity of the solvents were influenced by the printing process. The results indicated that the properties of the ink solvents were not altered by the printing process when compared with virgin or raw ink solvents (P.C. 54).

Because of the many problems associated with drafting satisfactory rules, the Board will conduct an additional hearing for the heatset web offset category only. For purposes of generating a sufficient record, the Board proposes a new rule for first notice. As previously noted, the Board does not necessarily advocate this rule nor is it presently based on an adequate record. An additional hearing will help supplement the existing record and provide an opportunity for more detailed scrutiny and examination of the Battelle study's new findings.

As a final matter, the Board is proposing, for first notice Section 215.205, which was inadvertently omitted from the August 10, 1985, Order due to an improperly perceived nexus with Section 215.207. The Agency's public comments submitted during first notice served to distinguish these two sections (P.C. 57). Because an entire rule was not included in the August 10, 1984, first notice order, it is necessary to submit Section 215.205 for first notice publication.

With its original proposal in this matter (Ex. 1), the Agency sought to amend Section 215.205 as adopted in R78-3, 4: RACT I. That Section contains emission standards, based on capture and destruction efficiencies, as alternatives to the volatile organic material limitations for surface coating operations contained in Section 215.204. When reviewing Section 215.205, as an amendment to the State Implementation Plan (SIP), the United States Environmental Protection Agency (USEPA) found it to be possibly deficient. The Illinois Environmental Protection Agency ("Agency") agreed to undertake a study and submit any necessary amendments to the Board; the State, thereby, gained conditional approval of that portion of the SIP (45 FR 11472, at 11482; Ex. 2).

The Board takes official notice that based on the Agency's study (described below) the USEPA now requires that the control efficiency percentages be revised to conform with its Control

Technique Guideline (CTG) in order to cure the conditional approval for that portion of the SIP (49FR 20521 at 20522).

The amendments proposed by the Agency to Section 215.205 are based on the agreed study, which was submitted as Exhibit 11 in the rulemaking. The Agency proposed to increase the control efficiency required at the process equipment for all types of surface coating facilities regulated under Section 215.204, except for the can coating processes, from 75 percent to 81 percent. No change was proposed for can coating operations using add-on controls because the control efficiency at these sources remained undetermined by the study. (The USEPA found that 75 percent control efficiency currently required represents reasonably available control technology for can coating.) Focusing on the collection efficiency at Illinois paper coating facilities, it was determined that a reasonably available collection efficiency ranged between 91 and 94 percent. Based on this, the 81 percent figure was proposed for the remaining surface coaters.

The proposed amendments to Section 215.205 were unopposed at hearing and no public comments were received on the issue. To rectify any possible SIP deficiencies and avoid sanctions under the Clean Air Act, the Board will adopt the amendment as proposed for Section 215.205. Therefore, at all surface coating operations regulated under Section 215.204, using the alternative control mechanisms provided under Section 215.205, 81 percent of the emissions from the coating line are to be captured and 90 percent of the nonmethane volatile organic material captured is to be oxidized. This option would not be available for can coating operations. The alternative control mechanisms provided under Section 215.205 entail utilizing capture and destruction equipment as opposed to compliance coating.

#### ORDER

The Board adopts for first notice language further amending 35 Ill. Adm. Code 215: Organic Emission Standards and Limitations. Section 215.205, Alternative Emission Standards, is amended and Subpart P: Printing and Publishing is amended to include new rules regulating heatset web offset lithographic printing. A hearing shall be scheduled regarding the new proposed rules for this industrial category. The new language shall read as follows:

#### SUBPART F: COATING OPERATION

##### Section 215.205 Alternative Emissions Standards

Owners or operators of coating lines subject to Section 215.204 may comply with this Section, rather than with Section 215.204. The methods or procedures used to determine emissions of organic material under this s Section shall be approved by the Agency.

Emissions of volatile organic material from sources subject to Section 215.204, are allowable, notwithstanding the limitations in Section 215.204, if such the emissions are controlled by one of the following methods:

- a) For those sources subject to Section 215.204(b) are controlled by A an afterburner system, provided that 75 percent of the emissions from the coating line and 90 percent of the nonmethane volatile organic material (measured as total combustible carbon) which enters the afterburner are oxidized to carbon dioxide and water; or
- b) For all other sources subject to 215.204 are controlled by an afterburner system, provided that 81 percent of the emissions from the coating line and 90 percent of the nonmethane volatile organic material (measured as total combustible carbon) which enters the afterburner are oxidized to carbon dioxide and water; or
- b) c) A The system used to control such emissions is demonstrated to have control efficiency equivalent to or greater than that provided under the applicable provision of Section 215.204 or subsections (a) or (b). as approved by the Agency.

(Source: Amended at 9 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_, 1985)

#### SUBPART P: PRINTING AND PUBLISHING

##### Section 215.402 Exemptions

The limitations of this Subpart shall not apply to:

- a) A any facility whose aggregate uncontrolled rotogravure and/or flexographic printing press emissions of volatile organic material are limited by operating permit conditions to 907 Mg (1000 tons) per year or less in the absence of air pollution control equipment or whose actual emissions in the absence of air pollution control equipment would be less than or equal to 907 Mg (1000 tons) per year when averaged over the preceding three calendar years; or
- b) Any facility whose aggregate uncontrolled heatset web offset lithographic printing press emissions of volatile organic material are 100 tons per year or less in the absence of air pollution control equipment, or so limited by operating permit conditions.

(Source: Amended at 9 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_, 1985)

##### Section 215.405 Compliance Dates and Geographical Areas

a) Except as otherwise stated in subsection (b), every owner or operator of an emission source subject to: this Subpart

1) Section 205.401 shall comply with its standards and limitations by December 31, 1983.

2) Section 215.408 shall comply with its standards and limitations by December 31, 1985.

b) If an emission source is not located in one of the counties listed below ~~and is also not located in any county contiguous thereto~~, the owner or operator of the emission source shall comply with the requirements of this Subpart no later than December 31, 1987:

<u>Bond</u>	<u>Madison</u>
<u>Clinton</u>	<u>McHenry</u>
<u>Cook</u>	<u>Monroe</u>
<u>DeKalb</u>	<u>Montgomery</u>
<u>DuPage</u>	<u>Morgan</u>
<u>Franklin</u>	<u>Pope</u>
<u>Greene</u>	<u>Randolph</u>
<u>Jackson</u>	<u>Saline</u>
<u>Jersey</u>	<u>Sangamon</u>
<u>Johnson</u>	<u>St. Clair</u>
<u>Kane</u>	<u>Union</u>
<u>Kendall</u>	<u>Washington</u>
<u>Lake</u>	<u>Will</u>
<u>Macoupin</u>	<u>Williamson</u>

~~{Board note: These counties are proposed to be designated as nonattainment by the USEPA (47 Fed. Reg. 31588, July 21, 1982)}~~

(Board note: The USEPA noted in its redesignation rulemaking, that it will publish a rulemaking notice on Williamson County's attainment status. (45 Fed. Reg. 21849, May 16, 1983) Should Williamson County be redesignated as attainment prior to October 31, 1985, it and the counties contiguous to it will be considered deleted from the above list.)

c) Notwithstanding subsection (b), if any county is designated redesignated as nonattainment by the USEPA at any time subsequent to the effective date of this Subpart Section, the owner or operator of an emission source located in that county or any county contiguous to that county who would otherwise be subject to the compliance date in subsection (b) shall comply with the requirements of this Subpart within one year from the date of redesignation but in no case later than December 31, 1987.

(Source: Amended at 9 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_, 1985)

Section 215.407 Compliance Plan

- a) The owner or operator of an emission source subject to Section 215.405(a) (1) shall submit to the Agency a compliance plan, ~~pursuant to 35 Ill. Adm. Code 201, Subpart H, including a project completion schedule where applicable,~~ no later than April 21, 1983.
- b) The owner or operator of an emission source subject to Section 215.405(a)(2) shall submit to the Agency a compliance plan no later than December 31, 1985.
- b) c) The owner or operator of an emission source subject to Section 215.405(b) shall submit to the Agency a compliance plan, ~~including a project completion schedule where applicable,~~ no later than December 31, 1986.
- e) d) The owner or operator of an emission source subject to Section 215.405(c) shall submit a compliance plan, including a project completion schedule plan, including a project completion schedule within 90 days after the date of redesignation, but in no case later than December 31, 1986.
- d) ~~Unless the submitted compliance plan or schedule is disapproved by the Agency, the owner or operator of a facility or emission source subject to the rules specified in subsections (a), (b) or (c) may operate the emission source according to the plan and schedule as submitted.~~
- e) The owner or operator of an emission source subject to Section 215.407(d) shall not be required to submit a compliance plan if redesignation occurs after December 31, 1986.
- e) f) The plan and schedule shall meet the requirements of 35 Ill. Adm. Code 201, Subpart H, including specific interim dates as required in 35 Ill. Adm. Code 201-242.

(Source: Amended at 9 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_, 1985)

Section 215.408 Heatset Web Offset Lithographic Printing

No owner or operator of a heatset web offset lithographic printing press subject to this rule may cause or allow the operation of such press unless:

- a) The fountain solution contains no volatile organic materials; or

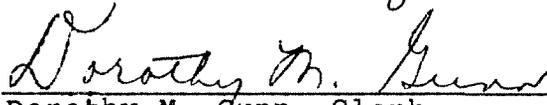
- b) The fountain solution contains no more than 12 percent, by weight, of volatile organic material, and an afterburner system is installed and operated which captures and oxidizes at least 90 percent of the organic materials (measured as total combustible carbon) to carbon dioxide and water; or
- c) The fountain solution contains no more than 7 percent, by weight, of volatile organic material, and a condensation recovery system is installed and operated that removes at least 75 percent of the organic materials from the airstream; or
- d) An alternative emission control system demonstrated to have a total reduction efficiency equal to that required in Subsection (a)(b) or (c) above.

(Source: Added at 9 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_, 1985)

Chairman J. D. Dumelle concurred.

IT IS SO ORDERED

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Proposed Order/First Notice was adopted on the 30<sup>th</sup> day of May, 1985, by a vote of 6-0.

  
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Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board/