

ILLINOIS POLLUTION CONTROL BOARD
January 5, 1989

IN THE MATTER OF:)
)
VISKASE CORPORATION, ADJUSTED RACT)
PETITION PURSUANT TO 35 ILL. ADM.)
CODE 215 . SUBPART I.) AS 88-1
)

CLIFTON A. LAKE, OF MCBRIDE, BAKER & COLES, APPEARED ON BEHALF OF
VISKASE CORPORATION.

JAMES MORRIS APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by J. Marlin):

This matter comes before the Board on an August 5, 1988
Petition filed by Viskase Corporation (Viskase) pursuant to 35
Ill. Adm. Code, Subpart I, Adjusted RACT Emissions Limitations.
On April 25, 1988 Viskase filed its Notice of Intent to file a
Petition for Adjusted RACT Emission Limitation.

Public Act 85-1321, which became effective August 31, 1988,
amends Section 10 of the Environmental Protection Act (Act) by
adding the following language:

Any person who prior to June 8, 1988, has
filed a timely Notice of Intent to Petition
for an Adjusted RACT Emissions Limitation and
who subsequently timely files a completed
petition for an adjusted RACT emissions
limitation pursuant to 35 Ill. Adm. Code,
Part 215, Subpart I, shall be subject to the
procedures contained in Subpart I but shall
be excluded by operation of law from 35 Ill.
Adm. Code, Part 215, Subparts PP, QQ and RR,
including the applicable definitions in 35
Ill. Adm. Code, Part 211. Such persons shall
instead be subject to a separate regulation
which the Board is hereby authorized to adopt
pursuant to the adjusted RACT emissions
limitation procedure in 35 Ill. Adm. Code,
Part 215, Subpart I. In its final action on
the petition, the Board shall create a
separate rule which establishes Reasonably
Available Control Technology (RACT) for such
person. The purpose of this procedure is to
create separate and independent regulations
for purposes of SIP submittal, review, and
approval by USEPA.

Section 215.260, of Subpart I, provides that the Notice of Intent must be filed within 60 days after the effective date of the Subpart and that a Petition must be filed within 120 days after the effective date of the Subpart. Subpart I became effective on April 8, 1988. Pursuant to Section 101.105, the computation of the time period begins with the first business day following "the day on which the act, event, or development occurs." Given this computation method, Viskase's Notice of Intent and Petition were both timely filed. As a result, the provisions of P.A. 85-1321 apply to Viskase.

Public Act 85-1321 provides that the Board is "authorized to adopt pursuant to the adjusted RACT emissions limitation procedure in 35 Ill. Adm. Code Part 215, Subpart I" a "separate regulation" for persons who meet the specific requirements set forth by P.A. 85-1321. As stated above, Viskase meets those requirements. Subpart I was promulgated by the Board in Docket R86-18 which is commonly referred to as the Generic Rule. The control requirements of the Generic Rule are provided in Subparts AA, PP, QQ, and RR of Part 215. The Board adopted the Generic Rule on April 7, 1988. 12 Ill. Reg. 7284, 7311 (April 22, 1988). However, persons who fall under the applicability of P.A. 85-1321 are "excluded by operation of law" from Subparts PP, QQ and RR.

Subpart I of Part 215 was adopted by the Board pursuant to the authority of Section 28.1 of the Act. That Section states:

In adopting a regulation of general applicability, the Board may provide for the subsequent determination of an adjusted standard for persons who can justify such an adjustment consistent with subsection (a) of Section 27 of the Act. The regulation of general applicability shall specify the level of justification required of a petitioner to qualify for an adjusted standard. The rule-making provisions of the Illinois Administrative Procedure Act in Title VII of this Act shall not apply to such subsequent determinations.

Ill. Rev. Stat. 1987, ch.
111¹/₂, par. 1028.1.

The Generic Rule provided a mechanism by which the Board could determine adjusted standards for that rule. Subpart I of the Generic Rule prescribed this adjusted standard procedure. Public Act 85-1321 excludes Viskase from the requirements of the Generic Rule (Subparts PP, QQ, and RR), yet it retains the adjusted standard procedure to be used for Viskase. Adjusted standards are determined by Board Order and are not subject to the rule-making requirements of the Illinois Administrative Procedure Act (APA). Although P.A. 85-1321 uses the term

"regulation" it is clear that the General Assembly has required the Board to utilize the adjusted standard procedure of Subpart I, not the rulemaking procedure of the APA, when adopting control requirements for the emission sources that are subject to P.A. 85-1321. These adjusted standards, adopted by the Board, will have the same force and effect as standards promulgated through the rule-making process.

Therefore, the Board's role is to adopt a RACT volatile organic material (VOM) standard for Viskase, pursuant to the procedures of Subpart I. This standard will be considered separate and independent from other Board determinations for the purposes of the State Implementation Plan (SIP) review by the U.S. Environmental Protection Agency (U.S. EPA).

Subpart I puts the burden of proof upon the petitioner, in this case, Viskase. The Illinois Environmental Protection Agency (Agency) filed a Response to Viskase's Petition on September 22, 1988. A hearing was held on November 1, 1988; members of the public were present. Both Viskase and the Agency filed post-hearing briefs on November 28, 1988. Viskase filed a Reply Brief on December 5, 1988. The Agency filed no Reply Brief.

Effectively, Section 215.263 requires Viskase to show that an 81% reduction in uncontrolled VOM emissions is not RACT for Viskase and that the emission reductions proposed by Viskase are RACT and would not interfere in the State's achievement of ambient air quality standards.

RACT is defined by Section 211.122 as "the lowest emission limitation that an emission source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility".

In its April 7, 1988 Opinion for R86-18, the Board quotes a U.S. EPA comment which expands further on the concept of RACT.

In evaluating economic feasibility for RACT, the Agency (U.S. EPA) gives significant weight to cost-effectiveness. However, no specific cost-effectiveness threshold exists to determine RACT. Numerous other factors, (i.e., age of facility, quantity of emissions, nature of emissions, severity of existing air quality problems, extent of controls present, comparability to standard industry practice in related industries, cross media impacts, economic impacts, etc.) must be considered in establishing RACT.

(In The Matter of:
Organic Material Emission
Standards and Limitation:
Organic Emission Generic

Rule, R86-18, (April 7, 1988). slip op. at 39.

Viskase manufactures cellulose meat casings at its Bedford Park plant. In manufacturing these casings, Viskase employs the viscose process. The viscose process involves the use of carbon disulfide (CS₂) which is the primary source of VOM emissions from the Bedford Park plant. Viskase is currently permitted to emit 1476 tons per year of VOM. (R. 43). Its emission reduction proposal entails a reduction in allowable emissions; Viskase proposes a maximum emission rate of 994 tons per year (tpy). The allowable emissions reduction lowers CS₂ emissions by 482 tpy. Additionally, Viskase proposes to eliminate 49 tpy of non-CS₂ VOM emissions. Evidently, these reductions are not figured against the present permitted level of 1476 tpy.

This proposed reduction, in allowable emissions, is to be accomplished without the use of an afterburner. Instead Viskase has merely proposed to implement process and production level changes to account for the reductions in allowable emissions. Viskase has begun utilizing wood rather than cotton as a cellulose source for its manufacturing processes. Viskase asserts that 12.4% reduction in CS₂ is achieved by such a change. (R. 24). In addition, it has already implemented the use of all water-based coatings for its coating operations and has permanently shut down a flexographic printer. (R.120).

As a seasonal reduction, Viskase commits to limiting its VOM emissions during June, July and August to 68 tons per month. According to Viskase, such a limit can be achieved by scheduling the maintenance work on the casing extruding machines for those months; when the machines are undergoing maintenance repairs, the plant's emissions will be reduced due to lack of operation.

Viskase's proposed annual maximum emission rate is 994 tons of VOM. Viskase is currently permitted to emit 1476 tpy. If Viskase had to reduce its current allowable emission rate by 81%, it could not emit more than 280.4 tpy. In summary, Viskase proposes to emit 713.6 tpy in excess of an emission level which would be in compliance with an 81% overall reduction.

Viskase asserts that an 81% overall VOM reduction is not RACT due to the following reasons: incineration of CS₂ would be required for 81% control and implementation of an incinerator would be so costly that Viskase would be forced to shut down its Bedford Park operations; other negative environmental effects from incineration outweigh any environmental gains realized by the thermal destruction of CS₂; and the Occupational Safety and Health Administration (OSHA) is in the process of proposing a new Permissible Exposure Level (PEL) for CS₂ which would increase the air flow and lower the concentration of CS₂ in Viskase's exhaust, thereby making incineration even less cost effective; and the level of reactivity of CS₂ to produce ozone is so low that controls are unwarranted.

Cost of Incineration

Viskase currently operates at a ventilation rate of 200,000 standard cubic feet per minute (scfm). If OSHA changes the PEL for CS₂ from the current level of 20 parts per million (ppm) to 10 ppm, Viskase will have to operate at 300,000 scfm. Correspondingly it has estimated costs for destroying the 805 tpy (81% control of 944 tons) under each scenario.

	<u>Incineration Costs</u> <u>200,000 (scfm)</u>	<u>300,000 (scfm)</u>
Capital costs	\$13,500,000	\$17,400,000
Annual operating costs	\$ 5,400,000	\$ 7,200,000
\$ per ton CS ₂ removed (at 81% overall removal efficiency)	\$ 6,764	\$ 9,016 (Attachment #1 to Odewald testimony)

With regard to incineration at CS₂ emission rates equivalent to the currently permitted level, Viskase stands by the cost-effectiveness figures which it presented in Docket R86-18. Specifically, it was estimated that an incinerator, operated for seven months out of the year would cost \$5300 per ton removed. Yet, if that same incinerator were operated year-round, the cost effectiveness would be approximately \$3400 per ton. These estimates include the costs for scrubbers which would be needed to control the sulfur dioxide (SO₂) emissions from the incinerator. (R 60-61; R86-18, slip op. at 37).

The Agency accepts the figures presented by Impell Corporation in Docket R86-18. The Agency states that Impell estimated a cost effectiveness, for a year-round operation of the incinerator, in a range of \$2030 to \$2412 per ton. This figure is calculated from a base of approximately 1500 tpy of allowable emissions.

However, Viskase now figures cost-effectiveness on the basis of a 994 tpy total allowable emission rate. Since Viskase's allowable emissions are reduced, the number of tons it can reduce through the use of an incinerator is similarly reduced. In turn, such a reduction operates as an increase for the cost-effectiveness value of incineration. As a result, Viskase

estimates that the annual cost-effectiveness for an incinerator (operated year-round) would be \$6800 per ton.¹ (R. 57; Attachment #1 of Odewald's Testimony).

The current allowable emission rate of 1476 tpy was based upon Viskase's emissions at full production. Viskase's Bedford Park plant is operated as a swing plant, since it is Viskase's most expensive plant to operate. (R. 1171; 131-32).

In recent years, Bedford Park's actual emissions have been significantly below the allowable emission level. Evidently, in 1987 Viskase only emitted 550 tons of VOM. In 1985 and 1986, Viskase's annual VOM emissions were near the 220 ton level. Testimony at hearing further indicates that the last time Viskase's emissions approached the currently allowable rate of 1476 tpy was sometime in the mid-1970's. (R.61) Consequently, if one were to figure cost-effectiveness based on actual emissions from the Bedford Park plant, the actual cost-effectiveness values would be significantly greater than the estimates presented by Viskase or the Agency. The Board notes, though, that in general it is more appropriate to figure cost-effectiveness values based on allowable, rather than actual, emission rates. After all, the allowable emission limit is the only legally enforceable limit. Viskase's decision to operate its Bedford Park plant at less than full capacity is purely a business decision which can be changed at anytime irrespective of the environmental consequences.

At hearing for the Generic Rule, R86-18, Viskase stated that it wanted to keep its allowable VOM emission rate at 1476 tpy notwithstanding the fact that its actual emissions had been significantly below that level in recent years. (R86-18, slip op. at 39). Now, though, Viskase is proposing an allowable emission rate of 994 tpy. This is approximately 33% reduction in allowable emissions.

At hearing, Judd Burdick, Vice-President of Operations for Viskase, testified that Viskase would not and could not absorb the cost of an incinerator at its Bedford Park facility. Burdick stated that the Bedford Park plant, as currently operated, has a 20% greater per unit cost of production than Viskase's Osceola, Arkansas plant. According to Burdick, if an incinerator were required at the Bedford Park plant, this unit cost discrepancy would rise to 49%. If an incinerator were required, Burdick concluded that "Viskase could not and would not continue to operate the Bedford Park plant." (R.118).

¹ The Board notes that Viskase's estimates concerning energy costs, labor, and specific savings from not using the hydrogen sulfide scrubbers, which were utilized to generate a cost-effectiveness value, have also been modified since R86-18.

Burdick further testified:

Rather than spend the \$13.5 million in capital and \$6.0 million in annual operating costs which would be required by such a pollution control system, Viskase would move its production operations from Bedford Park to existing plants located primarily outside of the United States.

While such a move would be not inexpensive, we have calculated that the payback, in terms of the avoided capital and operating costs of an incinerator at the Bedford Park plant, would return relocation costs within a period of 2 to 3 years.

(R.118)

Burdick also countered the Agency's suggestion that the costs of a VOM afterburner system could be passed on to Viskase's customers.

Because substantial excess cellulose casing manufacturing capacity exists in the world, the market is highly competitive. In fact, the market is so competitive that it has recently suppressed what would in other industries have been routine price increases. During the five years prior to October, 1988, for example, as depicted in Exhibit 10 to the Petition, prices for small cellulose casing have remained static, and prices for fibrous casing during the last three years have actually declined.

The reality of the marketplace makes clear that Viskase would have little success in increasing its product prices to pass on increased costs of pollution control equipment for carbon disulfide emissions at the Bedford Park plant. This is especially evident when it is recognized that Viskase's principal domestic competitor, TeePak Corporation, which operates a cellulose casing plant in Danville, Illinois, would not be subject to a similar control requirement under the generic VOM regulation. Even were TeePak not present in Danville, however, aggressive foreign competitors also exist in Japan, West Germany and Spain who would like nothing better than to sell their products to Viskase's customers should Viskase attempt to

raise its prices.

(R.121-123)

Burdick also described the beneficial impact of the Bedford Park plant on the State and local area.

The Bedford Park plant is Viskase's oldest casing production facility. The plant began operation in 1932. The facility employs more than 800 people. On an annual basis, the salaries of those employees exceed \$25 million per year. In addition, Viskase purchases goods and services in Illinois in the amount of \$34 million each year, most of which comes from the Chicago metropolitan area.

Viskase's state income and payroll tax payments are approximately \$1.5 million per year. The Bedford Park plant also pays \$375,000 in local property taxes, of which approximately \$200,000 is directly for the support of local schools. The plant pays more than \$100,000 per year in city and state utility taxes. Exports of products made at the Bedford Park plant are at the rate of approximately \$16 million per year.

(R.116-117)

Obviously, if Viskase moves its plant out of Illinois, such benefits will be lost.

Cross-Media Impacts of Incineration

Robert Odewald, Viskase's Manager of Environmental Affairs, testified regarding emissions which do not currently exist but would exist if Viskase installed an incinerator for CS₂ control. The emissions of the incinerator would in turn have to be controlled, by a scrubber, for SO₂. Odewald stated that for every pound of carbon disulfide, along with the associated hydrogen sulfide, destroyed by the incinerator process, two pounds of sulfur oxides would be produced; therefore, SO₂ scrubbers would be necessary. (R.31).

Odewald testified that based on the destruction of 805 tpy of CS₂ (81% reduction of 994 tpy), SO₂ emissions even after passing through a scrubber would be greater than 100 tpy. Although an exact figure is not given for the estimated amount of SO₂ emissions after scrubbing, Viskase presents some figures which can be manipulated to estimate the emission level. Without a scrubber on an incinerator, and assuming 2 pounds of sulfur oxides being generated for each pound of CS₂ destroyed, Viskase

would produce 1610 tpy of sulfur oxides. Assuming that a scrubber would reduce SO_2 by 81 percent (R.36), Viskase, even after scrubbing for SO_2 , would emit 306 tpy of SO_2 (81% reduction of 1610 is 1304 tpy reduction). Viskase claims that under its 994 tpy "cap" proposal it would not emit any SO_2 . (Attachment #2 to Odewald testimony).

Viskase points out that the Bedford Park plant is located in an area "which reported among the highest ambient sulfur dioxide concentrations in Illinois during 1986". (R.31).

Also, a Viskase witness testified that "[s]ulfur dioxide is roughly equivalent in reaction-rate and mechanism to carbon disulfide in ozone production potential on a per molecule basis". (R.94). However, no evidence was presented which shows that the reaction rate and mechanism of SO_2 are roughly equivalent to that of CS_2 .

In addition, Viskase asserts that incineration of 994 tpy of CS_2 would generate 11,000 tpy of carbon dioxide (CO_2) which Viskase would not otherwise emit. (R.34). Viskase points out that CO_2 levels in the atmosphere have been labeled by atmospheric scientists as "the most significant pollutant" which could contribute to a global warming, commonly referred to as the "greenhouse effect". (R.37).

The sulfur dioxide scrubbing of the emissions of an incinerator (controlling 994 tpy of CS_2) would produce over 7 million pounds per year of sodium sulfate (Na_2SO_4) solution. This equates to 21,000 pounds per day of Na_2SO_4 being discharged with the Bedford Park plant's wastewater. Viskase asserts that Na_2SO_4 is considered a "toxic chemical" and must be reported under the "Community Right-to-Know" provisions of the Superfund Amendments and Reauthorization Act (SARA).² If Viskase did not incinerate CS_2 it would not produce this amount of Na_2SO_4 solution.

Viskase has also calculated the amount of additional energy which would be needed if it incinerated 994 tpy of CS_2 . Viskase states that it would need to consume 4 pounds of fuel oil for every pound of CS_2 destroyed. Viskase estimates that the annual amount of energy used by an incinerator/scrubber system would be equivalent to that needed to heat 2,100 homes. (R.41).

The Agency provides little information or argument which counters Viskase's estimates concerning cross-media impacts. The Agency claims that a Viskase incinerator would only be operated

² The Board notes that Viskase cites 42 U.S.C. §11013 as authority for this conclusion. The Board believes that Viskase may be referring to 42 U.S.C. §11023.

for 7 months of the year and the Agency concludes that the additional pollutants resulting from incineration should be reduced by 5/12 the estimated amounts. (Ag. Comments, p. 7). However, Judd Burdick testified that Viskase would have to operate an incinerator 12 months out of the year in order to achieve 81 percent removal. (R.134). In R86-18, the Agency, itself, advocated that the Board look to the cost-effectiveness figures which assumed a 12-month operating period for the incinerator. (R86-18, slip op. at 38).

Concerning the cross-media impacts, the Agency states that such impacts, alone, do not warrant a "no control" option for Viskase. (Ag. Comments, p. 6).

OSHA Standard

As stated earlier, OSHA is currently in the process of revising the PEL for CS₂. On June 7, 1988, OSHA proposed to reduce the PEL to 1 ppm. However, if the PEL is changed from the current 20 ppm to 10 ppm, Viskase estimates that it would have to increase its ventilation from 200,000 scfm to 300,000 scfm. (R.20). According to Viskase, such a change in ventilation would correspondingly increase the annual cost-effectiveness of any incinerator from \$6800 per ton removed of CS₂ to \$9000 per ton removed. (R.57). Viskase asserts that if the PEL were lowered to 1 ppm, as OSHA has currently proposed, it could not comply with such a standard. (R.83).

The Agency asserts in its comments that if Viskase were to increase its air flow by 100,000 scfm, "the concentration of carbon disulfide in the plant's air flow [would] be so diluted as to render the cost-effectiveness of an afterburner beyond the RACT level". (Agency Comments, p.6). Due to this conclusion, the Agency recommends that if the Board accepts Viskase's proposal, it should condition the emission standard to expire within 3 years unless Viskase commits to increasing the air flow irrespective of OSHA's final determination. That is, apparently the Agency would not be opposed to Viskase's proposed emission standard, as a permanent level, if Viskase increases the air flow of its ventilation system.

Reactivity of Carbon Disulfide

Viskase presented Gary Z. Whitten, who has a doctorate in gas-phase kinetics, to address the issue of the degree to which CS₂ forms ozone. Dr. Whitten assisted in the development of the Empirical Kinetics Modeling Approach (EKMA) and the Urban Airshed Model (UAM) which are used in estimating the production of ozone. (R.86). According to Whitten, these are the only two computer models approved by the U.S. EPA to assess control strategies to achieve the national ambient air quality standard for ozone. (R.84). Whitten testified that the typical U.S. EPA application of EKMA "ignore[s] the individual reactivities or effectiveness of different types of VOC." (R.97-98). Whitten

also stated:

[T]he recommended use of EKMA tacitly assumes that controlled VOCs [volatile organic chemical] will be equal in effectiveness toward reducing ozone as the effectiveness of the average VOC in the default urban mixtures of EKMA.

(R.98).

On the topic of ozone production and the relative effectiveness of certain precursors, Whitten testified:

Although emissions of NOx and VOC are known to be the generic chemical precursors to urban ozone or smog formation, the effectiveness towards ozone formation of individual emissions sources is complex and not easily understood. The basic factors which separate the most effective smog precursors from the least effective precursors are (1) the atmospheric chemical reactions unique to each chemical species, (2) the magnitudes of the sources involved, (3) the timing of the emissions, (4) the locations of the various sources and (5) the concentration of the precursors which are emitted. Since the other four factors can influence the atmospheric chemistry, reactivity is not readily quantified or understandable by discussing only the atmospheric chemistry of an individual precursor species.

Notwithstanding the above statements, Whitten described the relative effectiveness of CS₂ in the production of ozone. Whitten stated that CS₂ can produce only a single ozone molecule upon reaction. On the other hand, a typical VOC, like pentane, can produce two ozone molecules, according to Whitten. (R.92). On a weight basis, CS₂ only has approximately 10% of the ozone producing potential of an equal weight of a typical VOC. (R.93).

In terms of Viskase's emissions, Whitten stated:

In order to relate the weight of carbon disulfide on equivalent typical VOC weight basis as required by USEPA's model, a reduction factor of 4.8 must be applied. Further, the mechanistic equivalent for carbon disulfide to produce ozone is only one-half of that of a typical VOC, which results in a net reduction factor of 9.6. In effect, this factor reduces the 805 tons per

year of carbon disulfide emissions which would be reduced by Viskase Corporation to an equivalent of 84 tons per year of a typical VOC like pentane. When the ozone production potential of sulfur dioxide generated from incineration of carbon disulfide is considered, it reduces the benefit of controlling 805 tons per year of carbon disulfide down to 44 tons of VOC per year. This amount is less than 1/100 of 1 percent of the total VOC emissions in the Chicago area.

(R.100-101)

Whitten concluded that controlling Viskase's CS₂ "will not produce a significant ozone ambient air quality benefit". Whitten asserts that the reactivity of CS₂ is "equivalent to the lowest reactivity category considered in atmospheric models such as EKMA", and when CS₂ does react, Whitten claims that "it produces one-half as much ozone as a typical VOC like pentane". Finally, the total amount of CS₂ emissions from Viskase are "very low when compared with the total VOC emissions on the Chicago Metropolitan area", according to Whitten. (R.100).

In the Agency Comments, the Agency reviews Whitten's testimony and states:

Thus in terms of ozone control, by mass, one must control 4.8 pounds of carbon disulfide by mass to have the same impact as controlling 1 pound of a more typical volatile organic material. Considered in these terms, the cost-effectiveness values predicted by Viskase must be multiplied by 4.8 for a fair comparison of cost-effectiveness values predicted for other volatile organic materials.

(Ag. comments, p. 5-6)

Yet, the Agency is unwilling to state that such an adjustment is allowed by the U.S. EPA for RACT determinations.

Conclusions

At hearing, the Agency stated that the Bedford Park plant should essentially be considered as a single source of VOM emissions. The Agency found that the most economical application of VOM control equipment would be the control of the consolidated CS₂ emissions which are presently ducted through hydrogen sulfide scrubbers as a single gas stream. (R.148). Given the record before the Board, it appears that the only technically feasible method of add-on control for Viskase's CS₂ emissions is

incineration. (R.21-30). Viskase is currently allowed to emit 1476 tpy of VOM. However, it is now proposing to reduce that allowable emission level, by approximately 33%, to 994 tpy. If Viskase were to install an incinerator to achieve an overall 81% control of 1476 tpy, its emission would be approximately 280 tpy. Consequently, the difference between the allowable emission level proposed by Viskase (and effectuated without the use of an incinerator), and that which would result from an 81% control is approximately 714 tpy. Consequently, the primary issue before the Board is whether it is reasonable to require Viskase to install an incinerator in order to further eliminate the 714 tpy of CS₂ emissions.

In order to destroy the additional 714 tpy of CS₂, Viskase would have to install an incinerator. The cost-effectiveness of such an incinerator would be different than previously indicated. The previous cost-effectiveness values computed in the R86-18 proceeding were based on a total uncontrolled emission rate of approximately 1500 tpy. Since Viskase is proposing a reduced, total uncontrolled emission rate of 994 tpy, the cost-effectiveness values should similarly change. The Agency states that since the uncontrolled emission rate has been reduced by about 30%, the cost-effectiveness values rise about 40%³. (R.151; Ag. Comments, p.3).

Adding 40% to cost-effectiveness, estimated by Impell in R86-18, and relied upon by the Agency, would yield annual cost-effectiveness values in the range of \$2842 to \$3377 per ton of CS₂ removed. The Agency asserts that the cost-effectiveness values adjusted for the 994 tpy level are still within a RACT range. (Ag. Comments, p.4).

Viskase asserts that the annual cost-effectiveness value is \$6,800 per ton. The Agency criticizes Viskase's use of a cost-effectiveness value which assumes a year-round operation of the incinerator. The Agency states that the costs for operating an incinerator are less than those considered by Viskase, since Viskase will only operate an incinerator for 7 months of the year. (Ag. Comments, p.3). The Agency seems to suggest that the appropriate cost-effectiveness value is arrived at by dividing the annualized capital and associated operating cost for operating an incinerator for only 7 months out of the year by the annual emissions reduction which would be realized if an incinerator were operated 12 months of the year. (See R.156-160).

Viskase asserts that such a cost-effectiveness figure is inherently inconsistent. According to Viskase, the cost needed to achieve an emission reduction should be divided by the amount

³ The Board estimates the increase to be approximately 67%.

of that reduction. Whether the cost-effectiveness value is calculated on a control being utilized for 7 months or 12 months out of the year, Viskase claims that the numerator and denominator of the fraction generating the cost-effectiveness figure should at least relate to the same scenario.

However, as the U.S. EPA commented in R86-18, there are other factors, other than cost-effectiveness, which must be considered in a RACT determination.

Viskase's Bedford Park plant began operation in 1935. The plant is not only old, but inefficient and costly to run. No other cellulose casing manufacturer has controls for CS₂ emission. (R.21). Although Viskase is proposing an allowable emission rate of 994 tpy, Viskase's actual emissions have not reached that level in recent years.

Currently, Viskase employs no controls for CS₂. However, it does operate hydrogen sulfide scrubbers. Its proposed 994 tpy emission limit will not require the need for additional controls.

If Viskase is forced to utilize an incinerator, in order to achieve an overall 81% control of VOM emissions, significant cross-media impacts would result. Incineration of 994 tpy of CS₂ would cause Viskase, even after scrubbing, to emit an estimated 306 tpy of SO₂⁴ and 11,000 tpy of CO₂ which would not otherwise be emitted. It is also significant to note that Whitten testified that SO₂ emissions are approximately equivalent to CS₂ emissions with regard to their potential to produce ozone. In terms of reducing ozone producing pollutants, an incinerator controlling CS₂ may not be as effective as what would normally be expected from a control providing 81% VOM removal.

In addition, the SO₂ scrubbing process would cause Viskase to discharge in its wastewater over 7 million pounds of Na₂SO₄ solution annually. Such a discharge could be avoided if Viskase did not utilize an incinerator.

Finally, the record shows that substantial amounts of energy could be saved if Viskase did not employ an incinerator.

Carbon disulfide falls under the definition of VOM. Consequently, sources emitting CS₂ are subject to any applicable VOM control requirements. Viskase's expert witness concedes that CS₂ is photochemically reactive to produce ozone, contrary to Viskase's assertion in its Petition. (R.105). Yet, the record indicates that as compared to other VOM's, CS₂ is relatively less effective in producing ozone, on a weight basis. Whitten

⁴ The Board has calculated the SO₂ emissions to be approximately 306 tpy. See p.9 of this Opinion.

suggests that 805 tons of CS₂ has the same ozone producing potential as 84 tons of a VOM like pentane. The Agency admits that controlling 4.8 pounds of CS₂ has the same effect on ozone production as controlling 1 pound of a typical VOM. While the Agency is unwilling to state that such a discrepancy in ozone producing capabilities can be factored into a cost-effectiveness value, it does not seem to the Board that such a discrepancy can be ignored in a RACT determination. The U.S. EPA has stated that the "quantity" and "nature" of emissions are factors which "must be considered in establishing RACT."

As a result, the ozone producing potential of 714 tpy of CS₂ is only a fraction of that associated with 714 tpy of a typical VOM. Since the objective of VOM regulation is to lower ozone production, this fact must be considered in light of the costs associated with the removal of 714 tpy of CS₂.

Viskase has asserted that it will not install an incinerator but would move its facility out of Illinois, and likely out of the country, if forced to comply with an 81% overall reduction. If Viskase moves, Illinois and the Bedford Park community would greatly miss the job opportunities provided by Viskase as well as the other economic benefits incidental to the Bedford Park plant's operation. No other cellulose casing manufacturer has to control CS₂ emissions, and apparently Viskase could not shoulder such a burden.

The creation of new pollutants is another "cost" of incineration which must be evaluated in light of the ozone producing potential of Viskase's emission. In such a light, it does not seem prudent to require Viskase to control its CS₂ emissions with an incinerator when such a control technology will produce a new major emission source of SO₂, which is a criteria pollutant under the Clean Air Act, 11,000 tpy of CO₂ emissions, and cause Viskase to discharge millions of pounds of Na₂SO₄ solution in its wastewater. In addition, testimony before the Board indicates that SO₂ may have the same ozone producing potential as CS₂. Also, it cannot be ignored that large amounts of energy are required for incineration.

Environmental regulation is intended to solve pollution problems, not merely transfer them from one medium to another. Given the other negative environmental impacts, any benefit gained by eliminating 714 tpy of Viskase's CS₂ emissions must be observed in the complete environmental context.

Generally, the Board does not have the capability of quantifying the environmental benefits and environmental costs of a particular pollution control strategy to the extent that a net environmental effect can be attained and weighed against the actual dollar cost of that control strategy. While such information would greatly aid the Board in its determinations, it is not easy to assign a dollar value to environmental resources, such as clean air or clean water. Notwithstanding these

considerations, regulatory decisions must be made. Often, as in the instant matter, relevant factors must be considered together, as a whole, rather than balanced against one another on some type of numerical scale. This seems consistent with the U.S. EPA's view of a RACT determination. The U.S. EPA takes the position that "no specific cost-effectiveness threshold exists to determine RACT", but rather "numerous other factors...must be considered in establishing RACT".

Given all the circumstances of this particular situation, the Board finds that an 81% reduction of uncontrolled VOM emissions would not constitute RACT for Viskase's Bedford Park facility. Viskase has proposed to reduce its allowable VOM emissions by 33%, to a level of 994 tpy. Such a reduction constitutes RACT for the Bedford Park facility and will not interfere with the State's progress toward achieving ambient air quality standards.

Viskase has committed to a limit of 68 tons/month for the months of June, July, and August. The Agency states that such a distinction which extends for less than the full ozone season would not be approved by the U.S. EPA. (Ag. Comments, p.4). The Agency requests a 2.87 tons/day monthly average without referring to a 994 tpy limit. Presumably, this average would apply to each month of the year.

Viskase requests limits of 2.22 tons/day for June, July and August, and 3.30 tons/day as an average for each other month. Alternatively, Viskase asserts that a limit of 2.89 ton/day, rather than 3.30, would be sufficient if averaged over the nine-month period which does not include June, July and August.

Since Viskase is willing to commit to less emissions during the summer months of June, July, and August, the Board believes that it should hold Viskase to that commitment by way of emission limits. Although reduced emissions would not extend for the whole ozone season (April through October), extra relief from ozone precursors during those summer months could certainly benefit the air quality of the Chicago area. Viskase is able to accomplish the summer emission reduction through the scheduling of maintenance activities on its production line. There is nothing in the record to suggest that such activities, which result in less CS₂ emissions, could be extended over the entire ozone season.

Viskase insists that an average of 3.30 ton/day for each of the other nine months is necessary to allow Viskase to make-up for lost production due to periods when operations are down for maintenance or other reasons. The Board accepts the need for such flexibility at the Bedford Park plant particularly in light of the fact that it is operated as a swing plant. However, allowing for such intra-month flexibility does not absolve Viskase from its duty not to exceed the overall annual emission

limitation of 994 tpy.

Consequently, the Board will require that Viskase's Bedford Park plant's VOM emission not exceed 994 tpy. In addition, Viskase shall be subject to the following emission standards: 2.22 tons/day, computed as a monthly average, for the months of June, July and August; and 3.30 tons/day, computed as a monthly average for each of the other nine months. The methodology for computing a monthly average from daily emission values will be determined by Agency permit. Viskase apparently accepts such a provision. (Viskase Reply, p. 7).

The Board accepts the Agency's recommendation concerning methodologies which are to be used for calculating emissions. In addition the Board will utilize the data record-keeping and maintenance requirements as suggested by the Agency. Such records would be useful in evaluating whether Viskase is complying with the emission standards adopted today. Viskase has not argued against these particular recommendations. The Board has added a requirement that any daily emission values which are computed must be kept on file as well.

The emission standards prescribed by today's Order shall take effect immediately. Neither the Agency nor Viskase have presented the Board with argument to suggest that an alternative effective date is necessary.

Finally, the Agency requests that the Board limit applicability of a standard for three years if Viskase's proposal is accepted. Viskase opposes such a "sunset" provision because such a provision would merely "extend the economic limbo" of the Bedford Park plant, according to Viskase. The Board is not convinced that the standards adopted today must be re-visited in three years. Therefore, the standards do not contain an automatic repeal date.

ORDER

Pursuant to the authority of Section 10 of the Environmental Protection Act, as amended by Public Act 85-1321, and provided that Viskase Corporation's (Viskase) plant located in Bedford Park continues to utilize the viskose process in manufacturing cellulose casings, the Board hereby adopts the following emission standards applicable to Viskase's Bedford Park plant. These standards become effective on the date of this Order.

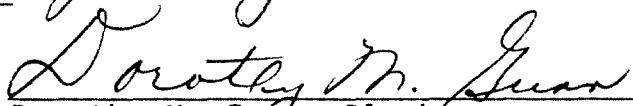
1. The volatile organic material (VOM) emissions from Viskase's Bedford Park plant shall not exceed 994 tons per year. In addition, VOM emissions, computed on a monthly average basis, shall not exceed the following: 2.22 tons per day for each month during the period from June through August; and 3.30 tons per day for each month during the period from September through May.

2. Emissions of VOM, including carbon disulfide, from the Bedford Park plant shall be determined from raw material consumption and plant-specific emission factors. These factors shall be developed using the methods and procedures for testing contained in 40 CFR 60 (1988), including Appendix A, Method 2, 2A, 2B, 15, 25, 25A and 25B, as appropriate. The methodology for computing a monthly average from daily emission values will be determined by the permit, issued to Viskase by the Illinois Environmental Protection Agency, which prescribes the emission standards set forth herein.
3. In accordance with the applicable methodologies, Viskase shall:
 - a) Maintain a monthly record of raw material consumption by each processes or group of processes subject to a different emission factor; and
 - b) Calculate and record monthly VOM emissions, daily VOM emissions, average daily VOM emissions in tons/day, on a monthly basis.
4.
 - a) Records of testing shall be retained by Viskase at its Bedford Park facility for at least 5 years following the date last relied upon for calculating emissions; and
 - b) Raw material consumption records, VOM emission calculations, and VOM emission records shall be retained by Viskase at its Bedford Park facility for at least 2 years following the date prepared.

IT IS SO ORDERED.

Section 41 of the Environmental Protection Act, Ill. Rev. Stat. 1985 ch. 111 $\frac{1}{2}$ par. 1041, provides for appeal of final Orders of the Board within 35 days. The Rules of the Supreme Court of Illinois establish filing requirements.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 5th day of January, 1989, by a vote of 7-0.


 Dorothy M. Gunn, Clerk
 Illinois Pollution Control Board