BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF GREIF PACKAGING, LLC	)	AS 2011-01
FOR AN ADJUSTED STANDARD FROM	)	
35 ILL ADM. CODE PART 218	)	(Adjusted Standard – Air)
SUBPART TT	)	

NOTICE OF ELECTRONIC FILING

TO:

John Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

Charles Matoesian
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

PLEASE TAKE NOTICE that I have today electronically filed with the Office of the Clerk of the Illinois Pollution Control Board, Petitioner's **NOTICE OF ELECTRONIC FILING, SECOND AMENDED PETITION FOR AN ADJUSTED STANDARD** and **CERTIFICATE OF SERVICE**, copies of which are attached herewith served upon you.

Respectfully submitted,

ICE MILLER, LLP

By: /s/ Susan Charles
One of its Attorneys

Date: August 10, 2011

Thomas W. Dimond
Susan Charles
ICE MILLER LLP
200 West Madison Street
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CERTIFICATE OF SERVICE

I, the undersigned, certify that on this 10th day of August, 2011, I have served electronically the attached NOTICE OF ELECTRONIC FILING and SECOND AMENDED PETITION FOR AN ADJUSTED STANDARD upon the following person:

John Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

and by electronic and U.S. Mail, first class postage prepaid, to the following persons:

Charles Matoesian
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

/s/ Susan Charles
Susan Charles

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF GREIF, INC. AND	)	AS 2011-001
GREIF PACKAGING LLC	)	
FOR AN ADJUSTED STANDARD FROM	)	(Adjusted Standard – Air)
35 ILL ADM. CODE PART 218	)	
SUBPART TT	)	

SECOND AMENDED PETITION FOR AN ADJUSTED STANDARD

GREIF, INC. and GREIF PACKAGING LLC ("Greif"), through counsel and pursuant to 35 Ill. Adm. Code § 104.400, *et seq.*, submit this Second Amended Petition for an Adjusted Standard ("Petition") to the Illinois Pollution Control Board ("Board"), seeking an adjusted standard from 35 Ill. Adm. Code § 218.986(a) as it applies to the emissions of volatile organic material ("VOM") into the atmosphere from Greif's fiber drum manufacturing facility located at 5 S 220 Frontenac Road in Naperville, DuPage County, Illinois.

I. INTRODUCTION AND SUMMARY OF PROPOSED ADJUSTED STANDARD

Greif operates a fiber (paper) drum container manufacturing facility in Naperville, DuPage County, Illinois. In general, fiber drums are produced by cutting fiber material to the appropriate length, forming the material into a cylinder and attaching a top and bottom to the cylinder. Some of the fiber drums require the addition of a polyethylene drum liner to meet customer specifications, particularly for storage and transport of food-grade products. Greif conducts quality control ("QC") testing of the liners of these drums by spraying a QC test fluid (a denatured alcohol product, which is a VOM) into the interior of the drums at the QC spray station.

Greif uses an automated system to spray the interior of the drum liners with QC test fluid. As a drum moves along the conveyor belt toward the QC spray station it triggers a sensor on the guide rail that causes the drum to stop. A mechanical wand then drops down into the drum and sprays the QC test fluid. The wand is calibrated so that each spray releases about the same amount of QC test fluid into each drum. Once the QC test fluid has been sprayed onto the drum liner, the wand retracts so the drum may continue to move along the conveyor.

The drums then are conveyed 45 feet to the QC inspection station where the interior of the drum is visually inspected for pinholes. If pinholes are present, the ethanol causes a brown spot to appear, enabling the line inspector to detect the pinhole. The drum next is conveyed 120 feet to a drying oven where most of the remaining test fluid is evaporated. After leaving the drying oven any remaining fluid is vacuumed from the drum and then the drum is wiped dry. VOM is emitted throughout the QC Test Process as well as in the paint drying oven.

Greif tracks its VOM emissions on a monthly basis by calculating the mass of VOMs used and assuming that all usage is emitted to the atmosphere. To calculate mass, Greif records the volume of denatured alcohol held as inventory on the first and last day of each month. Greif also tracks the volume of any denatured alcohol purchased within each month. The volume of denatured alcohol purchased during a month is added to the inventory held on the first day of that month. The total, less any inventory remaining on the last day of the month, equals the volume of denatured alcohol used. The volume is then multiplied by the VOM content (in pounds per gal) of the denatured alcohol to compute the mass (in pounds) of VOM emitted during the month.

Air emissions of VOM and hazardous air pollutants ("HAPs") at Greif's Naperville facility are subject to Federally Enforceable State Operating Permit No. 9707044 ("FESOP").[1] Condition 3 of the FESOP limits VOM emissions from the QC Test Process to 22.8 tons per year ("tpy"). Condition 3 also includes emission unit specific limits on VOM emissions from the remainder of the plant (which includes a paint spray booth, a caulk applicator, and ink printing). The aggregate of these limits is 1.4 tpy. The FESOP limits HAP emissions to 10 tpy for any single HAP or 25 tpy for any combination of such HAPs. Greif reported 2010 emissions from its Naperville facility of 9.95 tons of VOM (plant-wide) and total combined HAPs of 1.87 tons.

On July 5, 2007, the Illinois Environmental Protection Agency ("Agency") issued Violation Notice A-2007-00132 ("Violation Notice") to Greif alleging, in relevant part, that the Naperville facility exceeded condition 3 of the FESOP, relating to VOM emissions. Greif reported emissions from the QC Test Process in 2006, 2007, 2008, 2009 and 2010 of 35.2, 46.7, 19.1, 7.7 and 8.95 tons, respectively. The Agency alleges that Greif's VOM emissions now are subject to the 81 percent capture and control requirements of 35 Ill. Adm. Code Part 218, Subpart TT, Section 218.986(a), because emissions in 2006 and 2007 exceeded the 25 tpy applicability threshold and because Subpart TT is a "once in – always in" regulation. *See* 35 Ill. Adm. Code Section 218.980 (a) – (c).

The Board promulgated 35 Ill. Adm. Code Part 218 to implement reasonably available control technology ("RACT") for sources of VOM emissions within certain areas of Illinois. *See In the Matter of Reasonably Available Control Technology for Major Sources Emitting Volatile*

[1] In 2006, the FESOP was issued to Greif Bros. Corporation, which had changed its name to Greif, Inc. Greif, Inc. has transferred ownership and operation of the Naperville plant to its wholly owned subsidiary, Greif Packaging LLC. When the FESOP is renewed, it will also be transferred into the name of Greif Packaging LLC.

Organic Materials in the Chicago Ozone Nonattainment Area: 25 Tons, R93-14, Final Order (January 6, 1994). Section 218.986 provides, in relevant part:

> Every owner or operator of an emission unit subject to [Subpart TT] shall comply with the requirements of subsection (a), (b), (c), (d), or (e) below.
>
> a) Emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit . . ..

Greif conducted a RACT Study to evaluate whether various emission control options for the QC Test Process satisfy RACT control requirements in Section 218.986(a). *See* Exhibit A, Reasonably Available Control Technology Study, dated August 2010, revised March 2011, prepared for Greif by Thomas C. Ponder, Jr., PE ("RACT Study"). Greif submitted the RACT Study to the Agency on September 16, 2010. The RACT Study evaluated three capture and control systems: capture plus recuperative thermal oxidizers, capture plus carbon adsorbers and capture plus biofilters and material substitution. The RACT Study concludes that each option could achieve at least 81 percent capture and control of VOM emissions as required under Section 218.986(a), but only at a cost per ton of VOM emissions controlled of between $11,667 - $17,672. These costs exceed what the Board typically has considered reasonable in adopting RACT regulations. *See infra* at Section II(H)(1)(d).

The RACT Study also evaluated the technical feasibility and economic reasonableness of two material substitution options: mixing the QC test fluid with acetone or water. Material substitution using acetone was found to be technically infeasible because of product quality concerns related to the effect of acetone on the product. Acetone in the QC test fluid causes the gasket material that seals the drum bottom to the side walls to dissolve, which is unacceptable. However, material substitution using a test fluid composed of 45 percent denatured alcohol and

55 percent water achieves a 55 percent reduction in VOM emissions and results in an overall cost reduction. The RACT Study concludes that the material substitution option using 45 percent denatured alcohol and 55 percent water constitutes RACT for Grief's Naperville facility.

After determining that the 45/55 QC test fluid mixture could satisfy appropriate product quality standards, Greif conducted additional tests to determine whether the amount of QC test fluid applied to each drum run through its QC Test Process could be reduced. Based on this testing, Greif determined that it could reduce the QC test fluid sprayed to an amount not to exceed 48 grams.

Based on the RACT Study and the analysis of adjusted standard requirements as set forth herein, Greif has satisfied the conditions for issuing an adjusted standard from the 81 percent capture and control requirement of Section 218.986(a).

II. 35 ILL. ADM. Code Section 104.406: Petition for Adjusted Standard

The procedural requirements for submission of an adjusted standard petition to the Board are found at 35 Ill. Adm. Code Part 104, Regulatory Relief Mechanisms, Subpart D. Sections 104.406(a) – (l) of Subpart D specify the information that must be included in any adjusted standard petition. The requisite headings and corresponding information required under Subpart D are set forth below.

A. Standard From Which Relief Is Sought – Section 104.406(a)

Greif seeks an adjusted standard from the requirements of 35 Ill. Adm. Code Part 218, Subpart TT, Section 218.986(a), Control Requirements, which sets emission reduction requirements for sources of VOM emissions not regulated under other subparts of Part 218. Section 218.986 became effective January 6, 1994. *RACT for Chicago Ozone*, R93-14. Pursuant to Section 218.980(b)(1), the applicability threshold for Subpart TT is the potential to emit 25

tpy of VOM, in the aggregate, from emission units at a source other than those specifically excluded from Subpart TT. The control requirements for qualifying emission units at sources subject to Subpart TT are set forth in Section 218.986. Section 218.986 provides, in relevant part:

> Every owner or operator of an emission unit subject to [Subpart TT] shall comply with the requirements of subsection (a), (b), (c), (d), or (e) below.
>
> a) Emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit . . ..

Greif seeks an adjusted standard from the 81 percent capture and control requirement of Section 218.986(a) as it applies to Grief's Naperville facility. The facility is not seeking an adjusted standard from Section 218.986(b) – (e).[2]

As Greif will demonstrate, achieving capture and control of at least 81 percent of VOM emissions from its QC Test Process is not economically reasonable as applied to Greif, could increase emissions of other pollutants and may pose increased health and safety risks. Other alternative control strategies are technically infeasible because of negative impacts on product quality. Instead, Grief proposes to dilute the QC test fluid from 100 percent denatured alcohol to 45 percent denatured alcohol and 55 percent water. Greif also will limit the amount of QC test fluid that will be sprayed into each drum. These proposed modification of the QC Test Process will reduce VOM emissions from Greif's QC Test Process by approximately 70 percent on a unit basis – to an annual emission level that is below the applicability threshold of Subpart TT.

[2] Subsections (b) – (e) are not applicable to the QC Test Process at Naperville and thus are not included in this Petition. *See* 35 Ill. Adm. Code Section 218.986(b) – (e) (applicable to: coating lines (subsection (b)), submission of an equivalent alternative control plan (subsection (c)), non-contact process cooling water (subsection (d)) and specific control measures applicable to leaks from components subject to the control requirements of Subpart TT (subsection (e))).

Greif will not require an adjusted standard from Section 218.108, "Exemptions, Variations, and Alternative Means of Control or Compliance Determinations" for the adjusted standard from Section 218.986(a) to become effective at the state level. Section 218.108 provides:

> Notwithstanding the provisions of any other Sections of this Part:
>
> a) Any exemptions, variations or alternatives adopted by the Board pursuant to Section 28, 28.1 or 35 of the Act to the control requirements, emission limitations, or test methods set forth in this Part shall be effective only when approved by the USEPA as a SIP revision.

While the Agency will need to request the United States Environmental Protection Agency's ("USEPA") approval of any Board-approved adjusted standard from Section 218.986(a) in the form of a SIP revision, the adjusted standard will be effective at the state level immediately upon granting by the Board. *See In the Matter of: Petition of Alumax Inc. for an Adjusted Standard from 35 Ill. Adm. Code Part 218*, AS 92-13, Slip. Op. at 4 (September 1, 1994); *see also, In the Matter of Reasonably Available Control Technology for Major Sources Emitting Volatile Organic Materials in the Chicago Ozone Nonattainment Area: 25 Tons,* R93-14, Slip. Op. (Second Notice) at 5-6 (November 18, 1993).

B. Nature of the Regulation of General Applicability – Section 104.406(b)

The Board promulgated 35 Ill. Adm. Code Part 218 to implement Section 182(b)(2) of the Clean Air Act, 42 U.S.C. § 7511a(b)(2), which, among other things, requires individual states with severe non-attainment areas to adopt RACT regulations applicable to sources of VOM emissions within the non-attainment area. *See RACT for Chicago Ozone*, R93-14, Slip Op. (Final Rule) at 2. As mandated by the Clean Air Act, the Board promulgated Part 218, including Subpart TT. *Id.*

C. Level of Justification – Section 104.406(c)

The regulations of general applicability from which Greif seeks an adjusted standard do not specify a level of justification for an adjusted standard. Accordingly, the level of justification is that generally applicable to all adjusted standards. *See* 415 ILCS 5/28.1 (Authorizing the Board to grant an adjusted standard upon adequate proof of the following: (1) the factors relating to the petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to the petitioner; (2) the existence of those factors justifies an adjusted standard; (3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and (4) the adjusted standard is consistent with applicable federal law.).

D. Facility and Process Description – Section 104.406(d)

Greif operates a fiber drum container manufacturing facility in Naperville, DuPage County, Illinois. DuPage County is part of the Metropolitan Chicago Interstate Air Quality Control Region. 40 C.F.R. § 81.14. This area is designated as a non-attainment area for ozone (1-hour and 8-hour standard) under 40 C.F.R. § 81.314.

The Naperville facility employs about 90 hourly and salaried people. Fiber drum manufacturing began at the Naperville plant in April 1988. Greif's Naperville facility manufactures fiber drums ranging in size from six (6) gallons to seventy-five (75) gallons. In general, fiber drums are produced by cutting fiber material to the appropriate length, forming it into a cylinder and attaching a top and bottom to the cylinder. Some of the fiber drums require the addition of a polyethylene drum liner to meet customer specifications, particularly for storage and transport of food-grade products.

Greif conducts QC testing of the drum liners as follows: (1) as a drum moves along the conveyor belt toward the QC spray station it triggers a sensor on the guide rail causing the conveyor belt to stop; (2) a mechanical wand drops into the drum and releases the QC test fluid; (3) the mechanical wand retracts, the conveyor belt is restarted and the drum is conveyed 45 feet to the QC inspection station where the interior is visually inspected for pinholes (if pinholes are present, the ethanol causes a brown spot to appear, enabling the line inspector to detect the pinhole); (4) the drum is conveyed 120 feet to a drying oven where most of the remaining test fluid is evaporated; (5) after leaving the drying oven any remaining fluid is vacuumed from the drum and the drum is wiped dry. The QC test fluid evaporates slowly, resulting in VOM emissions throughout the process. *See* RACT Survey at Section 1.0.

In addition to the QC Test Process described above, permitted VOM emission sources at the Naperville facility include a caulk applicator, the paint spray booth and ink printing. Each of these sources has a source-specific annual VOM limit in the FESOP, and the aggregate of those VOM limits is 1.4 tpy. Because the plant's emissions have historically been less than 25 tpy, the facility has not previously been subject to Subpart TT and does not employ any equipment to capture or destroy VOM emissions.

E. Investigation of Compliance Alternatives: Methods for Reducing VOM Emissions from Greif's Quality Control Testing Process Emission Unit – Section 104.406(e)

Relevant provisions of Section 218.986 would require Greif to capture and control at least 81 percent of VOM emissions from the QC Test Process through the application of emission capture and control equipment. Greif investigated multiple compliance alternatives and the corresponding costs for each alternative. *See* RACT Study at Section 3. As discussed below, the RACT Study demonstrates that dilution of the QC test fluid with water is the only technically

feasible and economically reasonable alternative. This alternative also can be implemented without increased health and safety risks and without additional emissions that may potentially offset the benefits of any associated VOM reductions.

1. *Capture Systems*

Greif's fiber drums with polyethylene liners are sprayed with the QC test fluid, conveyed 45 feet to the QC test station for visual inspection and then conveyed 120 feet to the drum paint oven to evaporate most of the QC test fluid. The QC test fluid evaporates while the drums are being sprayed, transported for and awaiting inspection and then conveyed to the drum paint oven. Any remaining test fluid is vacuumed or wiped from the drums and to the extent it still contains VOM, may still be emitting VOM. An effective capture system would require a tunnel enclosure covering the 165 foot conveyer system from the QC spray station to the inspection station and, later, to the drum paint oven. *See* RACT Study at Section 3.1. Enclosures also would be needed for the hood at the QC spray station and the opening of the drum paint oven to ensure adequate capture of emissions. *Id.* Ducting to the associated control device(s) also would be required from the QC Test Process hood, the conveyor tunnel enclosure and the drum paint oven. *Id.* This type of capture system is assumed for each control method discussed below. The capital and annual operating costs for the capture system are included within the cost summary for each control system.

2. *Control Technologies.*

Greif's RACT Study includes a thorough evaluation of the following add-on control technologies: (a) recuperative thermal incinerator; (b) carbon adsorption; and (c) biofilter and material substitution. *Id.* at Section 3.2. As detailed below, each of these potential control

systems are economically unreasonable, have inherent characteristics that could partially offset the environmental benefits of VOM reduction and/or have potentially harmful safety impacts.

a. **Recuperative Thermal Incinerators**

Thermal incinerators heat an exhaust stream to a temperature sufficiently high to oxidize (burn) VOM in the exhaust. Thermal recuperative oxidizers have a heat exchanger that preheats the incoming air by recuperating heat from the exiting air. *Id.* at Section 3.2.1. As the incoming air passes on one side of the metal tube or plate, hot clean air from the combustion chamber passes on the other side of the tube or plate. Heat is transferred to the incoming air through the process of conduction using the metal as the medium of heat transfer. This system has heat recovery as great as 60 percent and therefore requires less natural gas than traditional incinerators to boost the combustion temperatures to 1600°F (the required temperature to ensure complete destruction of VOM). *Id.*

While a recuperative thermal incinerator can be more cost-effective than a traditional incinerator, it requires a large amount of natural gas as compared to other control options (fuel must be used even when the QC Test Process is not operating to maintain the thermal oxidizer at temperature). *Id.* Frequent operation cycles in thermal oxiders cause condensation corrosion and thermal deterioration of the insulation which requires ongoing maintenance costs. *Id.* at Section 1.0. In addition, the large amount of natural gas required to operate thermal oxidizers generates NOx and CO emissions and small quantities of VOM and HAPs, which would partially offset any benefits obtained from the associated VOM reduction. *Id.*

The RACT Study concludes that total capital costs of the capture system and the recuperative thermal incinerator control technology at Greif's Naperville facility would be

$1,752,000 with annualized capital and operating costs of $17,672 per ton of VOM controlled. *See* RACT Study at Table 4-1.

b. **Carbon Adsorbers**

Carbon adsorbers are used to control systems with low to medium VOM emission concentrations. *See* RACT Study at 3.2.2. A carbon adsorber typically consists of two or more beds of activated carbon – one treats the exhaust emissions while the other is being regenerated. *Id.* Typically, regeneration involves passing steam through the carbon bed to remove the VOM with the steam, leaving the regenerated carbon to be reused. Carbon adsorbers work best with insoluble VOM, which simplifies the recovery of the VOM from the saturated beds. *Id.* In some cases, distillation is required to separate the VOM materials from the regeneration steam. *Id.*

The QC test fluid is water soluble and would be very expensive to recover from the regeneration fluid. *Id.* In addition, the regeneration fluid likely could be sent to a local sewage district along with Grief's other process wastewaters. *Id.* Most sewer districts use equalization basins to reduce biological oxygen demand loading, which in this context includes VOM, by blowing solvents into the atmosphere; meaning that VOM emissions may not truly be reduced by the use of carbon beds. *Id.* Further, ketones found in the denatured alcohol present an inherent safety risk of fires from reactions between the ketones and the carbon in the beds. *Id.* Although carbon beds that handle ketones utilize water deluge systems to control bed fires, the increased health and safety risks remain. *Id.*

The RACT Study concludes that total capital costs of the capture system and the carbon adsorbers control technology would be $1,170,000. This control option would result in total annualized capital and operating costs of $12,594 per ton of VOM controlled. *See* RACT Study at Table 4-1.

c. **Biofilter and Material Substitution**

Biofilters can be used to reduce VOM emissions without the use of natural gas to burn the hydrocarbons. *See* RACT Study at Section 3.2.3. Bioren has proposed to install a biofilter on the Greif drum plant in Oakville, Ontario, which could potentially reduce VOM emissions from that plant by 70 percent. *Id.* At Naperville, the 81 percent capture and control objective could be met only by combining the biofilter with another control technology or by considering the reductions in VOM emissions from the use of the water diluted test fluid as a capture and control technology reduction. *Id.* A biofilter system has lower operating costs, although the capital costs are comparable to incinerators. *Id.* Biofilters must be heated to maintain destruction activity during winter months and heat for the filter can be supplied by the direct combustion of natural gas, steam or electricity. *Id.* Natural gas used for combustion would increase NOx emissions from the facility, partially offsetting the benefit from reductions in VOM emissions. *Id.*

Based on the RACT Study, total capital costs to install the capture system and the biofilter control technology (which includes use of the water diluted test fluid) is $1,800,000 and annualized capital and operating costs are $11,667 per ton of VOM controlled. *See* RACT Study at Table 4-1.

3. *Material Substitution Options*

a. **QC Test Fluid – Dilution with Acetone**

Greif considered dilution of the QC test fluid with acetone (a non-VOM material) as a possible alternative. However, dilution of the testing fluid with acetone could cause the gasket material sealing the bottom of the drum to the drum walls to dissolve. *See* RACT Study at 3.3.2.

Due to the potential for product damage, diluting the QC testing fluid with acetone is considered technically infeasible. *Id.*

b. **QC Test Fluid – Dilution with Water**

Grief evaluated the operational impact of diluting the QC test fluid with varying amounts of water as a means to reduce VOM emissions. Grief experimented with different ratios of water to denatured alcohol to identify the composition able to reduce VOM emissions to the greatest extent possible while maintaining the ability to visually detect pinholes or other tears or imperfections in the drum linings.

The testing procedure involved intentionally creating pinholes in the liners of five drums before sending them through the QC Test Process. The drums were sprayed with varying modifications of the QC test fluid and visually inspected to determine if the pinholes could be detected within an acceptable time period (here, about 70 seconds). *Id.* at 3.2.1. If the pinholes were detected, the test and the associated test fluid were considered acceptable. *Id.* If the pinholes could not be detected, the fluid was considered a technically infeasible option based on Grief's inability to meet its customers' quality assurance standards. *Id.*

Greif experimented with five potential alternative test fluids. A mixture of 80 percent denatured alcohol and 20 percent water revealed pinholes in each of five test drums within about 5 seconds. *Id.* Based on this result, Greif next experimented with a mixture of 70 percent denatured alcohol and 30 percent water. The 70/30 mixture revealed pinholes in each of five test drums after 7 seconds; but with noticeably lighter staining than with the 80/20 mixture. *Id.* A third test, using a 50 percent denatured alcohol and 50 percent water mixture identified significantly lighter staining around pinholes in each test drum within 45 seconds. *Id.* The test using 40 percent denatured alcohol and 60 percent water failed to identify flaws in the liners

within an acceptable time period. *Id.* Grief then evaluated a 45 percent denatured alcohol and 55 percent water mixture. This mixture detected all of the pinholes within 50 seconds of spraying – although with significantly lighter staining. *Id.* Based on these test runs, Greif determined that 55 percent dilution with water was the highest dilution percentage that would allow the plant to meet its customer's quality assurance requirements.

Greif informed the Agency of these test results and began utilizing the diluted QC test fluid in May 2008 to achieve immediate reductions in VOM emissions even though the Agency had not formally approved the substitution. To date, the water-diluted test fluid has allowed the detection of drum defects without harming the product.

After determining that the 45/55 QC test fluid mixture could satisfy appropriate QC standards, Greif conducted additional tests to determine whether the amount of QC test fluid applied to each drum could be reduced. Based on this testing, Greif determined that it could reduce the QC test fluid sprayed into each drum to an amount not to exceed 48 grams.

Diluting the QC test fluid with water and reducing the amount of fluid used also has the potential to reduce annual emissions of VOM from the QC Test Process below the 25 tpy applicability threshold of Section 218.980 and below the 22.8 tpy emissions limit in condition 3 of the FESOP. This has been demonstrated by a significant reduction in overall facility emissions between 2007 and 2008 and the approximate 70% reduction in per drum emissions. In addition, diluting the QC test fluid with water results in lower operating costs. Total capital costs to dilute the QC test fluid with water would be $0 and annualized capital and operating costs are reduced by $541 per ton of VOC controlled. *See* RACT Study at Table 4-1.

4. *Compliance Alternatives Conclusion*

Three capture and control systems would be technically feasible: capture plus recuperative thermal oxiders, capture plus carbon adsorbers and capture plus biofilters and material substitution. While each of these options could achieve the 81 percent capture and control objectives of Subpart TT, the cost/ton of VOM controlled range from $11,667 to $17,672. These costs exceed what the Board has considered reasonable in adopting RACT regulations. *See infra* at Section II(H)(1). Material substitution using acetone is technically infeasible because of product quality issues. Material substitution using 55 percent water and 45 percent denatured alcohol combined with reducing the amount of QC test fluid applied to each lined drum that is tested results in an overall reduction in costs while achieving an approximately 70% reduction in VOM emissions compared to pre-substitution levels.

F. Greif's Proposed Adjusted Standard – Section 104.406(f)

Greif proposes the following adjusted standard for adoption by the Board:

1. The proposed adjusted standard applies to the emission of VOM into the atmosphere from Greif's fiber drum manufacturing facility located at 5 S 220 Frontenac Road in Naperville, DuPage County, Illinois (the Facility).

2. The Facility will reduce VOM emissions from its QC Test Process by using a test fluid composed of no more than 45 percent denatured alcohol by weight and no less than 55 percent water by weight.

3. The Facility will calibrate the QC Test Process equipment to spray no more than an average of no more than 48 grams of QC test fluid per drum with compliance to be measured at least once per calendar quarter by the following procedure.
   a. Weigh a plastic bag on a gram scale to determine the weight of the bag.
   b. Place the plastic bag over the spray head of the wand of the QC Test Process and secure it in place with a rubber band or binder clip.
   c. Cycle the QC Test Process by passing a drum through the process in the normal manner of operation with the plastic bag capturing the QC test fluid. Remove the plastic bag from the spray head of the wand of the QC Test Process and weigh it on the same gram scale used in step a.

d. Calculate the weight of QC test fluid sprayed as the difference between the weight determined in step c and the weight determined in step a.

e. Repeat steps a. through d. for five cycles of the QC Test Process. Calculate the average weight of QC test fluid sprayed per cycle and compare that average to the standard of an average of no more than 48 grams of QC test fluid per drum.

4. All records and logs required by this adjusted standard shall be retained at a readily accessible location at the source for at least five years from the date of entry and shall be made available for inspection and copying by the Agency or USEPA upon request. Any records retained in an electronic format (*e.g.,* computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Agency or USEPA request for records during the course of a source inspection.

5. The Facility will maintain records of its denatured alcohol usage that will allow the monthly calculation of the amount of denatured alcohol used during the month and the calculation of VOM emissions on a 12-month rolling total basis for comparison to annual VOM limits in the FESOP. To allow these calculations, the Facility will:

a. Record the volume of denatured alcohol held as inventory on the first and last day of each month.

b. Maintain records of the volume of denatured alcohol received at the Facility during each month.

c. The volume of denatured alcohol used for a month shall equal the inventory volume on the first day of the month plus the volume received at the Facility during the month, less the volume in inventory on the last day of the month.

d. The volume used during a month calculated in step c shall be multiplied by the VOM content of the denatured alcohol (in pounds per unit of volume) to compute the weight (in pounds) of VOM emitted during the month.

e. Using the emissions of VOM in pounds calculated for each month in step d, the Facility will compute the 12-month rolling VOM emissions for the QC Test Process and report those results to Facility management.

6. Greif will continue to investigate the availability of alternative QC test fluids with lower VOM content. Greif will incorporate such lower VOM QC test fluids into its QC Test Process provided that the lower VOM QC test fluids allow visual detection of pinholes or other tears or imperfections in the drum linings within an acceptable period of time and does not result in any negative product quality impacts.

7. The proposed adjusted standard will not affect the calculation of Greif's potential Emissions Reduction Market System ("ERMS") baseline or its ERMS allotment if Greif's Naperville plant should participate in the ERMS program.

8. Environmental staff of Greif's parent will conduct a formal training session for Naperville facility personnel on the requirements of the FESOP and the internal procedures for tracking compliance with FESOP conditions.

9. Emissions and operation of the QC Test Process shall not exceed the following limits:

	(Tons/Mo)	(Tons/Yr)
VOM Usage	2.3	22.8
VOM Emissions	2.3	22.8

These limits are based on the maximum material usage and the maximum VOM content. Compliance with the annual limit for the QC Test Process shall be determined from a running total of 12 months of data.

G. Quantitative and Qualitative Description of Greif's Impact on the Environment Before and After the Proposed Adjusted Standard – Section 104.406(g)

1. *Air Quality Impact Analysis of Greif's Operations*

Application of the proposed adjusted standard will allow Greif to reduce VOM emissions from the QC Test Process by about 70% on a per drum basis compared to pre-change levels. While this reduction is less than the 81 percent capture and control requirement of Section 218.986(a), the proposed adjusted standard will allow Grief to reduce VOM emissions below levels required by its FESOP and the threshold for Subpart TT applicability.

The emissions of VOM from the QC Test Process at the Naperville plant will have a minimal impact on air quality. In 2009, state-wide VOM point source emissions were 54,668 tons. *See* Illinois Annual Air Quality Report 2009, Table C-5 (IEPA November 2009) (available at www.epa.state.il.us/air/air-quality-report/2009/air-quality-report-2009.pdf) (2010 data was not available at the time Greif filed its Amended Petition). Thus, even at the maximum permitted emissions levels for the Naperville plant (22.8 tpy based on condition 3 of the FESOP), VOM

emissions from the QC Test Process would amount to about 0.04% of state-wide point source emissions. Similarly, 2009 VOM point source emissions for the Metropolitan Chicago area were 11,884. *See* September 8, 2010 E-mail from EPA.FOIA.BOA@ Illinois.gov to Susan Charles responding to Freedom of Information Act request, attached as Exhibit B. Assuming maximum emissions permitted under the FESOP for the Naperville plant, VOM emissions from the QC Test Process would amount to only 0.19% of Metropolitan Chicago point source emissions.

The Board previously has found that adjusted standards from Subpart TT from sources with much higher VOM emissions would have no significant impact on air quality. *See, e.g., In the Matter of: Petition of Ford Motor Co. (Chicago Assembly Plant) for an Adjusted Standard from 35 Ill. Adm. Code Section 218.986,* AS 00-6, Slip. Op. at 5 (April 6, 2000) (uncontrolled emissions of 390 tpy would have no significant impact on air quality or human health); *In the Matter of: Petition of Alumax, Inc. for an Adjusted Standard from 35 Ill. Adm. Code Part 218,* AS 92-13, Slip. Op. at 9 (Sept. 1, 1994) (excess uncontrolled emissions of 76 tpy would not significantly impact air quality). The Board also has shown a particular concern for capture and control technologies, such as incinerators, that create alternate emissions, *e.g.,* NOx, which also contribute to ozone formation or hazardous waste generation that offset any environmental gains from reducing VOM emissions. *See, e.g., Alumax,* AS 92-13, Slip. Op. at 7 (Board granted adjusted standard where control technologies created offsetting emissions of NOx and VOM); *In the Matter of: Joint Petition of Quantum Chemical Corporation, USI Division (and the Illinois Environmental Protection Agency) for an Adjusted Standard from Parts of 35 Ill. Adm. Code 218.966 and 218.986,* AS 92-14, Slip. Op. at 9 (Board granted adjusted standard where use of control technology would emit NOx which, like VOM, contributes to ozone formation, that would partially offset the benefits of VOM reduction).

2. *Cross-Media Environmental Impacts Resulting from an Adjusted Standard.*

None. Greif's waste and wastewater generation is independent of VOM emissions from the QC Test Process; therefore, no change in the nature or volume of waste and wastewater is anticipated.

H. Justification – Section 104.406(h)

Where, as here, the regulation of general applicability does not specify a level of justification required for a petitioner to qualify for an adjusted standard, Section 28.1(c) of the Illinois Environmental Protection Act, 415 ILCS 5/28.1(c), authorizes the Board to grant an adjusted standard upon adequate proof of the following: (1) the factors relating to the petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to the petitioner; (2) the existence of those factors justifies an adjusted standard; (3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and (4) the adjusted standard is consistent with applicable federal law.

1. *Factors Relating to Greif are Substantially and Significantly Different.*

The factors relating to Greif's ability to reduce VOM emissions are substantially and significantly different from any the Board may have relied on in adopting Subpart TT. First, the Board did not rely on any specific industry factors in adopting Subpart TT and, therefore, the factors associated with Greif's operations are necessarily "substantially and significantly" different. Second, Grief's ability to manage VOM emissions by diluting its QC test fluid and limiting the amount of QC test fluid sprayed into each drum is substantially and significantly different from factors the Board may have relied on in deciding to require capture and control

methods for managing VOM emissions. Third, even if Greif could not manage VOM emissions by dilution of the QC test fluid, the physical design of Greif's operations and the slow-evaporation of its QC test fluid are unique factors impacting and significantly limiting Greif's ability to capture and control VOM emissions through add-on controls. Fourth, the costs to achieve the 81 percent capture and control requirement of Section 218.986(a) would exceed the threshold cost level the Board previously has found to be economically reasonable.

a. **The Board Did Not Consider Factors Involving the Drum Manufacturing Business in Adopting Subpart TT.**

Subpart TT of Part 218 is essentially a "catch-all" applicable to VOM sources that are not governed by other subparts of Part 218. In adopting Subpart TT, the Board did not consider factors relating to any specific industry or practice – including the fiber drum manufacturing business. Rather, the purpose of Subpart TT was to cover sources that had not otherwise been specifically considered. *See* 35 Ill. Adm. Code § 218.980(a) and (b). The Board previously has reasoned that, because it did not consider any specific factors in adopting Subpart TT, virtually any factors specific to an industry or specific source not otherwise addressed in Part 218 would be "substantially and significantly different." *See Ford Motor Company (2000),* AS 00-6, Slip. Op. at 5.

In *Ford Motor Company*, the Board considered an adjusted standard petition in which Ford sought an alternative emissions control plan to address solvent cleanup operations at its Chicago assembly plant. *Id.* Slip Op. at 1. The Board stated that Subpart TT applies to VOM sources with certain characteristics that are not governed by other subparts of Part 218 and, in adopting Subpart TT, the Board did not consider factors relating to any specific industry or practice. *Id.* Slip. Op. at 5. The Board then ruled that, because factors relating to Ford's cleaning

operations were not considered in adopting Section 218.986(a), the requirement to demonstrate significantly different factors "is therefore met." *Id.*

b. **Greif's Ability to Manage VOM Emissions Through Dilution of its QC Test Fluid and Limitations on the Amount of QC Test Fluid Used Constitute Substantially and Significantly Different Factors.**

Even if the Board had considered factors impacting the capture and control of VOM emissions at drum manufacturers when it promulgated Section 218.986(a), it did not consider Greif's unique QC Test Process, the particular complexity of constructing capture equipment over an extended conveyor line or the ability to manage VOM emissions by diluting the QC test fluid with water and limiting the amount of QC test fluid applied to each drum. Construction of effective capture equipment is further complicated by the need to maintain physical access to the drums for visual inspection. This means the conveyor line cannot be totally enclosed to maximize capture. These factors are substantially and significantly different from emission units where material substitution is not possible and the construction and operation of emission capture equipment is less extensive.

c. **Greif's QC Test Process is Substantially and Significantly Different from Other Manufacturing Activities Considered by the Board.**

In addition, even assuming, *arguendo,* that capture and control could be an economically reasonable option, Greif's specific system would be complicated by the physical location of different production activities within the Naperville plant, the slow evaporation of the testing fluid and the need for Greif to inspect drums visually after the QC test fluid has been sprayed into the drum. The testing fluid begins to evaporate while being sprayed in the QC spray station. Evaporation continues while the drum is being conveyed to and awaiting QC inspection and also as the drums are conveyed from the inspection area to the drum paint oven and, possibly, even

afterward. Because the lined drums must be accessible for visual inspection by plant staff, complete enclosure of the drum conveyor line is not possible. These factors would require large capture systems, including a hood at the QC spray station, at the opening of the drum paint oven and along the conveyor used to transport the drums from the spray station to the inspection area and from the inspection area to the drum oven. *See* RACT Study at Section 1.0. The need to construct and operate a capture system this complex and this large likely was not considered by the Board in adopting Subpart TT and will significantly impact Greif's costs to control VOM emissions. *See infra at* Section II(H)(2).

d. **Costs of Achieving RACT Control Standard Exceed those Considered by Board in Setting RACT Standard.**

In addition, as reflected in the RACT Study, feasible technologies to achieve the 81 percent combined capture and control objective of Section 218.986(a) would require costs per ton of annual VOM removed ranging from $11,667 to $17,672. These costs exceed the threshold cost level the Board previously has found to be economically unreasonable. *See In the Matter of: Petition of Formel Industries, Inc. for an Adjusted Standard from 35 Ill. Adm. Code. 218.401(a), (b) and (c),* AS 00-13, Slip. Op. at 9 (January 18, 2001) (Board granted adjusted standard and the Agency agreed that costs of $10,911 - $18,041 per ton of VOM reduced were economically unreasonable); *Ford Motor Company (2000),* Slip. Op. at 5 (citing *In re: Petition of Louis Berkman,* AS 97-5 (Dec. 4, 1997) *aff'd sub nom EPA v. PCB,* 308 Ill. App. 3d 741, 746 & 752-53, 721 N.E.2d 723, 726-27 & 731 (2d Dist. 1999) (for proposition that costs exceeding $1,734 in 1996 dollars per ton of reductions was economically unreasonable); *In the Matter of: Joint Petition of Reynolds Metals Company and the Illinois Environmental Protection Agency for an Adjusted Standard from 35 IAC 218.980,* AS 91-8 (Sept. 21, 1995) (Board found $40,000 per ton of VOM reduced to be economically unreasonable).

2. *The Existence of These Factors Justifies an Adjusted Standard.*

The intent of the regulations promulgated under 35 Ill. Adm. Code Part 218 is to implement RACT for VOM emission sources in the Chicago ozone non-attainment area. *See In the Matter of Petition of Ford Motor Company (Chicago Assembly Plant) for an Adjusted Standard from 35 Ill. Adm. Code 218.986,* AS 02-3, Slip. Op. at 4 (November 21, 2002). Greif's RACT Study demonstrates that use of the water-diluted test fluid as an adjusted standard reduces emissions from the QC Test Process below the applicability threshold for Subpart TT[3] and below applicable FESOP limits while reducing costs. The existence of these factors demonstrates that dilution of the QC test fluid constitutes RACT and justifies the granting of the instant request.

3. *The Requested Standard Will Not Result in Adverse Health Effects.*

The requested adjusted standard will have little, if any, adverse impact on human health or the environment. In 2009, state-wide VOM point source emissions were 54,668 tons. *See Illinois Annual Air Report* at Table C-5 (2010 emission data was not available at the time Greif filed its Amended Petition). Thus, even at the maximum permitted emission levels for the Naperville plant (22.8 tpy based on condition 3 of the FESOP), VOM emissions from the QC Test Process would amount to less than 0.04% of state-wide point source emissions and only 0.19% of Metropolitan Chicago emissions. The Board has previously found that adjusted standards from Subpart TT from sources with much higher VOM emission levels would have no significant impact on air quality. *See, e.g., Alumax,* AS 92-13, Slip. Op. at 9; *Ford Motor Company (2000),* AS 00-6, Slip. Op. at 5.

[3] Greif understands that Subpart TT is a "once in-always in" rule. 35 Ill. Adm. Code Section 218.980(c). However, the fact that the diluted QC test fluid will bring emissions below the applicability threshold is of some significance because the Board certainly did not consider sources with uncontrolled emissions less than the threshold being subject to Subpart TT.

The Board has granted numerous exemptions to the 81 percent capture and control requirement in Subpart TT in cases where the annual VOM emissions that were exempted from Section 218.986(a) were significantly greater than those proposed by Greif. *See, e.g., Ford Motor Co. (2000)*, AS 00-6, Slip. Op. at 3 (even with uncontrolled emissions of 390 tpy of VOM, the Board found no significant impact on air quality or human health); *Quantum Chemical Corporation,* AS 92-14, Slip. Op. at 10 (Board agreed that operation of emission units resulting in over 260 tpy of VOM was small compared to the total VOM emissions in the Chicago ozone non-attainment area and would have no measurable impact on air quality); *Alumax*, AS 92-13, Slip. Op. at 9 (Board found the foregone emission reductions of 76 tpy from not achieving 81 percent control would not significantly impact human health).

Moreover, the Board previously has found that a control plan resulting in an overall emissions reduction constitutes a ***positive*** environmental impact. *See Ford Motor Company (2002),* AS 02-3, Slip. Op. at 4. In *Ford*, the Board found that a 50 tpy reduction of VOM emissions (from 390 tpy to 340 tpy – or 13%) was "significant" and would have a "positive impact on air quality." *Id.* Here, dilution of the QC test fluid and limitation on the amount of QC test fluid used per drum is producing roughly a 70% reduction of VOM emissions – an even greater reduction on a percentage basis than what was at issue in the *Ford* petition.

4. *The Requested Standard is Consistent with Federal Law.*

Section 110 of the federal Clean Air Act, 42 U.S.C. § 7410, grants individual states the authority to promulgate a plan for implementation, maintenance and enforcement of air quality standards, subject to approval by USEPA. Based on the RACT Study, the proposed adjusted standard constitutes RACT for the Greif facility, and is therefore consistent with the federal Clean Air Act. A state may revise its SIP, again subject to USEPA approval. 42 U.S.C. § 7410.

Greif will work with the Agency to submit a SIP revision to USEPA that is consistent with any adjusted standard granted by the Board.

J. Hearing – Section 104.406(j)

Greif requests a hearing in this matter.

K. Supporting Documentation – Section 104.406(k)

1. RACT Study, attached to this Petition as Exhibit A.

2. FOIA Response from Illinois Environmental Protection Agency, Bureau of Air, attached to this Petition as Exhibit B.

III. CONCLUSION

Greif requests that the Board grant the proposed adjusted standard as an alternative to the RACT regulations adopted by the Board in Subpart TT. To require Greif to comply with the requirements of 35 Ill. Adm. Code Subpart TT, Section 218.986(a), would result in substantial economic hardship to Greif with no corresponding environmental benefit. Certain compliance options examined by Greif could have the reverse effect of creating increased emissions of other pollutants and environmental detriment. Finally, add-on controls are unreasonably expensive, provide little, if any, environmental benefit and certain control options may result in increased health and safety risks.

WHEREFORE, Greif, Inc. requests that the Board grant Greif the proposed adjusted standard from 35 Ill. Adm. Code, Subpart TT, Section 218.986(a), as that rule applies to the emissions of VOM from Greif Packaging LLC's operations in Naperville, Illinois.

Respectfully submitted,

GREIF, INC. AND
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