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STATE OF ILLINOIS
Pollution Control Board

ILLINOIS POLLUTION CONTROL BOARD

November 8, 2011

IN THE MATTER OF:)
)
PETITION OF GREIF PACKAGING,) AS 11-1
LLC FOR AN ADJUSTED STANDARD) (Adjusted Standard – Air)
FROM 35 ILL. ADM. CODE 218)
SUBPART TT)

2 ORIGINAL

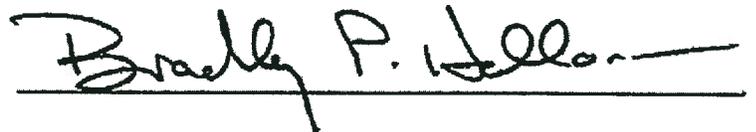
HEARING OFFICER ORDER

On November 8, 2011, all parties participated in a telephonic status conference with the hearing officer. December 20, 2011, was the date agreed to for the hearing in the above-captioned petition. The time and location of the hearing will be noted in the notice of hearing.

The hearing officer directs the petitioner to address the pre-hearing question attached to this order. A written response must be filed 10 days before the hearing.

The parties or their legal representatives are directed to appear at a telephonic status conference with the hearing officer on December 1, 2011, at 11:00 a.m. The telephonic status conference must be initiated by the petitioner, but each party is nonetheless responsible for its own appearance. At the conference, the parties must be prepared to discuss the status of the above-captioned matter and their readiness for hearing.

IT IS SO ORDERED.



Bradley P. Halloran
Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center, Suite 11-500
100 West Randolph
Chicago, Illinois 60601
312.814.8917

**AS 11-1 GREIF PACKAGING, LLC
HEARING QUESTIONS FOR PETITIONER AND IEPA**

35 IAC 104.406(g)

On November 1, 2011, Greif Packaging submitted its “Final Air Quality Impact Analysis of the VOC Emissions from the Greif Packaging Facility in Naperville, Illinois, Using the Scheffe Tables” (Air Quality Impact Analysis or Analysis) in response to the March 21, 2011 Hearing Officer Order. The following questions pertain to the calculations provided in the analysis.

A. Calculation of VOC Emissions for the Air Quality Impact

Page 2 of Greif’s Analysis explains that the Analysis “is intended to compute the air quality impact associated with the differential between the adjusted standard proposed for the Naperville facility and compliance with subpart TT...” (Air Quality Impact Analysis at 2.) The analysis used the following equation to arrive at the differential:

$$[22.8/(1-73.1\%)] * (81\% - 73.1\%) = 6.7 \text{ tons per year (tpy)}$$

where

- 22.8 = Maximum permitted VOC emissions from the QC test process at the Greif Naperville facility
- 73.1% = reduction rate actually achieved during 2009 and 2010 for the adjusted standard
- 81% = reduction rate required by Subpart TT

Based on a review of the information provided, it appears that the differential could be calculated as follows, producing a result that is closer to 1.8 tpy, which is less than 6.7 tpy:

$$[22.8 \text{ tpy} (1-.731)] - [22.8 \text{ tpy} (1-.81)] = 1.8 \text{ tpy}$$

where

- [22.8 tpy (1-0.731)] = VOM emissions with the proposed adjusted standard
- [22.8 tpy (1-0.81)] = VOM emissions based on the Subpart TT reductions

- Would you please clarify the differential VOM emissions to be used to compute the air quality impact?

B. Application of the Scheffe Tables

The Air Quality Impact Analysis relies on the “VOC/NO_x Point Source Screening Tables” by Richard D. Scheffe, September 1988 (Scheffe Method).¹ Page 7 of the Scheffe Method lists three steps for determining an ozone increment for the screening estimate:

- 1- **Determine which column of the screening tables is applicable.** Greif’s Analysis relied on the “Table 2. Urban based ozone increment (pphm) as a function of NMOC [nonmethane hydrocarbon] emissions and NMOC/NO_x ratios.” Greif’s Analysis calculated the annual VOC to NO_x ratio as $6.7 / 0.1992 = 33.63$, where 0.1992 is the 2009 annual NO_x emissions. Under Scheffe Table 2, the Analysis determined the column labeled “> 20.7” NMOC/NO_x ratio was applicable. (Analysis at 2.)

If the revised differential of 1.8 tpy calculated above is used, the NMOC/NO_x ratio appears to be $1.8 \text{ tpy} / 0.1992 = 9.036$. Based on this, the column in Table 2 labeled “5.2 – 20.7” appears to be applicable instead.

- 2- **Calculate annual NMOC emissions rates in tpy from maximum daily rate.** Greif’s Naperville facility maximum permitted annual VOC emissions is 22.8 tpy. No maximum daily rate is indicated, so the maximum permitted annual rate is used. (Analysis at 2.)
- 3- **Interpolate linearly to produce an interpolated ozone increment.** Page 2 of Greif’s Analysis used linear interpolation to calculate an ozone increment of 1.47 ppb associated with the increase of 6.7 NMOC tpy by using the “> 20.7” column of the Scheffe Table 2 and the following equation:

$$(1.1 \text{ pphm} * 0.01 \text{ pphm/ppb}) * (6.7 \text{ tpy} / 50 \text{ tpy}) = 1.47 \text{ ppb}$$

Consistent with the Scheffe method, it appears the linear interpolation could be calculated as follows::

$$y_2 = \frac{(x_2 - x_1)(y_3 - y_1)}{(x_3 - x_1)} + y_1$$

where the x-axis is the NMOC Emissions (tpy) and the y-axis is the Ozone Increment (pphm)

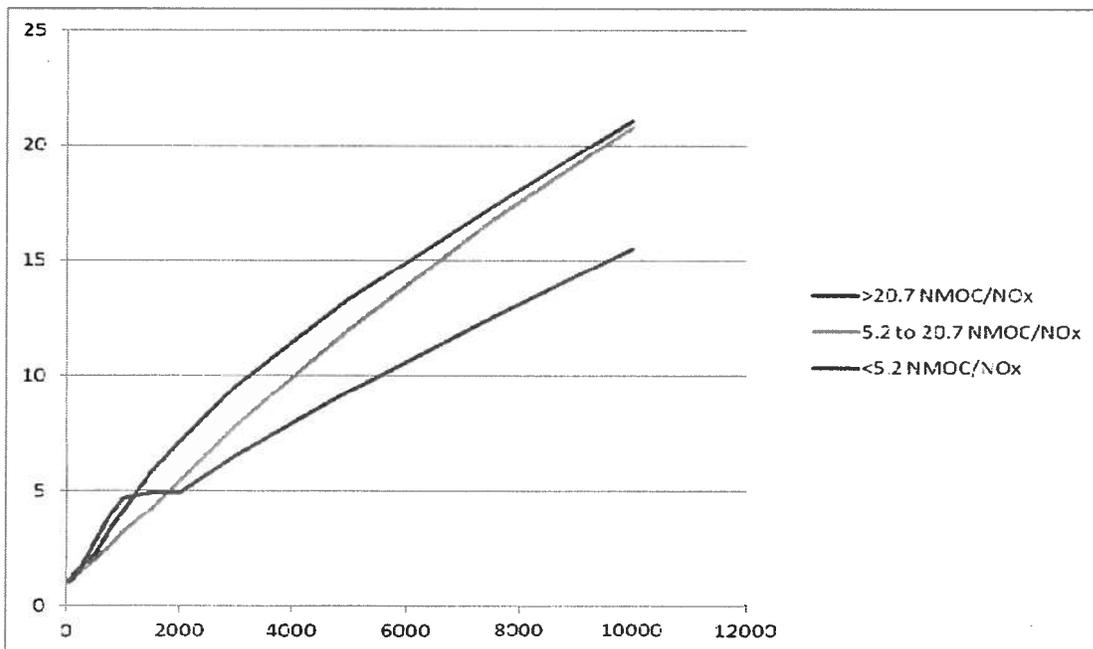
Graphed below is the Scheffe Table 2, demonstrating that each column has a different slope.

¹ <http://ndep.nv.gov/bapc/permitting/download/model/scheffe.doc>

Table and Graph based on the Scheffe Table 2: Urban based ozone increment (pphm) as a function of NMOC emissions and NMOC/NOx ratios.

		Ozone Increment (pphm, parts per hundred million)		
NMOC Emissions (tons/ yr)	NMOC/NOx (tons NMOC / tons NOx, PPMC/PPM)	>20.7 NMOC/NOx	5.2 to 20.7 NMOC/NOx	<5.2 NMOC/NOx
50		1.1	1.1	1
75		1.2	1.1	1.1
100		1.3	1.2	1.1
300		1.8	1.6	1.9
500		2.2	2	2.8
750		3.3	2.6	3.9
1000		4.1	3.2	4.7
1500		5.8	4.2	4.9
2000		7.1	5.4	4.9
3000		9.5	7.8	6.5
5000		13.3	12	9.3
7500		17.3	16.7	12.5
10000		21.1	20.8	15.5

Multiply pphm by 0.01 to obtain ppm



The example on page 9 of the Scheffe Method linearly interpolates the ozone increment from the two closet points as graphed from Table 2. However, Grief's emissions differential is lower than the lowest point in the table or on the graph. The Scheffe Table 2 and the resulting graph do not go to zero for either the NMOC emissions or the ozone increment, but a 0 pphm ozone increment would correspond to a 0 tpy NMOC emission. Therefore, for the purposes of a linear interpolation, the two closet points to the 1.8 tpy revised value above would be 0 and 50 NMOC Emissions, with an ozone increment between 0 and 1.1 pphm under the "5.2 – 20.7" column.

Based on this, the following equation could be used to linearly interpolate the ozone increment associated with 1.8 tpy NMOC emissions and 9.036 NMOC/NOx ratio:

$$y_2 = \frac{(x_2 - x_1)(y_3 - y_1)}{(x_3 - x_1)} + y_1$$

where:

$$y_1 = 0$$

$$y_2 = ? \text{ (ozone increment associated with NMOC emissions)}$$

$$y_3 = 1.1$$

$$x_1 = 0$$

$$x_2 = 1.8$$

$$x_3 = 50$$

yields:

$$\{[(1.8-0)(1.1-0)] / (50-0)\} + 0 = 0.0396 \text{ pphm}$$

$$0.0396 \text{ pphm} * 0.01 = 0.000396 \text{ ppm}$$

$$0.000396 \text{ ppm} * 1000 \text{ ppb} / \text{ppm} = 0.396 \text{ ppb}$$

It appears that the ozone increment associated with an increase of 1.8 tpy differential could be closer to 0.396 ppb rather than the 1.47 ppb that Greif associated with an increase of 6.47 tpy in its Analysis.

- Would you please clarify your analysis of the ozone increment?

C. Impact on Illinois Ability to Attain the 1-hour and 8-hour Ozone NAAQS

Pages 2 and 3 of the analysis conclude that adding 1.47 ppb to the highest of the fourth highest ozone measurements would not result in any exceedances of the 120 ppb 1-hour standard or 75 ppb 8-hour average ozone national Ambient Air Quality Standards (NAAQS).

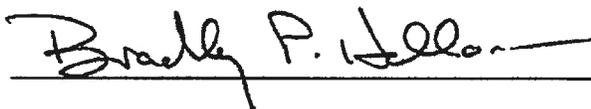
- Based on your comments regarding the revised calculations postulated above, would you please restate whether the impact of Greif's proposed adjusted standard would cause or contribute to violations of the NAAQS for ozone or delay efforts to attain the NAAQS in a timely manner?

CERTIFICATE OF SERVICE

It is hereby certified that true copies of the foregoing order were mailed, first class, on November 8, 2011, to each of the persons on the service list below.

It is hereby certified that a true copy of the foregoing order was hand delivered to the following on November 8, 2011:

John Therriault
 Illinois Pollution Control Board
 James R. Thompson Center
 100 W. Randolph St., Ste. 11-500
 Chicago, Illinois 60601



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