



## **NARRATIVE**

TO: Jeng-Hon Su  
FROM: Dawn Wu  
DATE: April 10, 2024

Facility Name: **Georgia-Pacific Corrugated LLC – McDonough Mailers**  
AIRS No.: 151-00061  
Location: McDonough, GA (Henry County)  
Application #: 29245  
Date of Application: March 25, 2024

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### **Background Information**

Georgia-Pacific Corrugated LLC – McDonough Mailers (hereinafter “facility”) operates a recyclable mailer manufacturing facility located at 1400 Highway 42 South in McDonough, Henry County, Georgia. The facility has been operating under Permit No. 2677-151-0061-S-01-0 which was issued on July 7, 2021.

The facility currently operates two permitted mailer manufacturing lines that produce recyclable padded mailers (RPM) by using a water-based seam adhesive to bond four sheets of paperboard, a water-based expandable adhesive to form beads that function as padding within the layers of each envelope, and a third hot-melt adhesive to form a closure tab. Each line is equipped with roll stands for the paperboard feedstock, machinery to form the mailers and apply the adhesives, a radio frequency (RF) dryer, and a flexographic printer to print limited information (e.g., barcode, logo, description) on the finished mailers.

### **Purpose of Application**

On March 25, 2024, Georgia-Pacific Corrugated LLC – McDonough Mailers submitted an application requesting the construction and operation of a recyclable unpadded mailer manufacturing line (RUM).

The new line for the manufacture of RUM uses a process that is functionally similar (i.e., production of from paperboard using adhesives and flexographic printing) yet simpler and lower emitting than the existing RPM lines. Paperboard feedstock is initially unwound from a roll and subsequently fed to the printing and adhesive application sequence. RUM of various dimensions will be produced; the process is designed to minimize trimmed material by using a feedstock roll width that can be folded and formed to the product dimension such that no trimming and scrap paper handling is necessary.

Product markings (e.g., logo, barcode, recycling instructions) are printed using flexographic printers with up to four colors – typically black plus others as required for product designs – using low-VOC waterborne inks. Non-VOC pH adjuster and anilox cleaners are used to maintain the flexographic printing process. A digital printhead may also be used for printing smaller markings on certain products.

Three adhesives (closure adhesive, side-seam lamination adhesive, bottom-seam adhesive) are applied to form the finished product, each performing a different function within each mailer and applied in varying amounts depending on the adhesive function and mailer size. Compared to the RPM lines, the RUM line does not use any expandable adhesive that would function as padding.

The Public Advisory started on March 27, 2024 and expired on April 26, 2024.

### **Updated Equipment List**

Emission Units			Associated Control Devices	
Source Code	Description	Installation Date	Source Code	Description
RPM1	Recyclable Padded Mailers Line 1	2021	n/a	n/a
RPM2	Recyclable Padded Mailers Line 2	2021	n/a	n/a
RUM1*	Recyclable Unpadded Mailers line 1	2024	n/a	n/a

\*Proposed within current application

### **Emissions Summary**

VOC and HAP emissions result from the application of adhesives from which some of the organic content is retained in the paperboard substrate and the remainder is emitted.

#### **Facility-Wide Emissions** (in tons per year)

Pollutant	Potential Emissions			Actual Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	--	--	--	--	--	--
NO <sub>x</sub>	--	--	--	--	--	--
SO <sub>2</sub>	--	--	--	--	--	--
CO	--	--	--	--	--	--
VOC	<100	<100	0	43.58	<48.02	<4.44
Max. Individual HAP	<10	<10	0	0.89	<0.95	<0.06
Total HAP	<25	<25	0	1.45	<1.51	<0.06
Total GHG (if applicable)	--	--	--	--	--	--

### **Regulatory Applicability**

Georgia Rule 391-3-1-.02(2)(b) Visible Emissions – The new recyclable unpadded mailer manufacturing line is also subject to this rule.

Georgia Rule 391-3-1-.02(2)(e) Particulate Emissions from Manufacturing – The new recyclable unpadded mailer manufacturing line is also subject to this rule.

Georgia Rule 391-3-1-.02(2)(w) VOC Emissions from Paper Coating – Rule(w) also applies to the proposed new recyclable unpadded mailer manufacturing line because the facility is located in Henry County and have actual VOC emissions greater than 15 lb/day. Under applicability criterion (w)11., the prescribed requirements are specified in applicability criterion (w)7. because Henry County and the Atlanta ozone nonattainment area were redesignated to attainment for the 1997 ozone NAAQS prior to January 1, 2015. The more stringent requirements of applicability criterion (w)9. have not been reinstated since meeting the requirements of a contingency plan. As specified in applicability criterion (w)7., the standards of subparagraphs (w)1., 2., and 6. apply.

Georgia Rule 391-3-1-.02(2)(mm) VOC Emissions from Graphics Arts Systems – As specified in applicability criterion (mm)6. for sources in Henry County (among other locations within the 1979 ozone NAAQS 13-county maintenance area), Rule (mm) applies if potential VOC emissions exceed 25 tpy from flexographic printing. Since the new recyclable unpadded mailer manufacturing line uses of low-VOC waterbased flexographic printing inks, potential emissions are unlikely to exceed 25 tpy even if multi-color graphics are printed. According to Application No. 29245, the current VOC PTE from flexographic printing processes is about 4.5 tpy. Therefore, GA Rule (mm) is not applicable to the facility.

There are no area source GACT standards that are applicable.

The potentially applicable MACT rules 40 CFR Part 63 Subpart KK and 40 CFR Part 63 Subpart JJJJ are not applicable because the facility is an area source of HAP emissions.

### **Permit Conditions**

Condition 6.2 in Permit No. 2677-151-0061-S-01-0 requires that the facility conducts a test to determine the VOC retention factor for the expandable adhesive. The condition has been deleted since the test was done in March 2022. The tested VOC retention ratio is 56.63%.

Condition 7.1 in Permit No. 2677-151-0061-S-01-0 requires the facility submits written notification to the Division within 15 days after the startup. Notification of startup of padded mailer production lines RPM1 & RPM2 was received by EPD in December 2021. The condition has been modified to request the facility submit the notification of startup of the new unpadded mailer production line RUM1.

Since the initial testing specified in Condition 6.2 has been completed, and Condition 6.2 has been removed, the content of existing Condition 7.5 that referenced Condition 6.2 would need to be revised. The Division has updated the initial test result in revised Condition 7.5.

### **Toxic Impact Assessment**

Since the facility proposed to construct and operate a new recyclable unpadded mailer manufacturing line, a toxic impact assessment is needed. The Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (revised May 2017) (“Guideline”) prescribes the analytical techniques to determine whether TAP emissions are expected to cause adverse impacts.

The facility expects the RUM line to utilize a different collection of inks and adhesives than the existing two RPM lines, with one exception: the side-seam lamination adhesive. RUM materials have generally low or zero HAP/TAP content.

TAP	Total PTE (ton/yr)	Total PTE (lb/yr)	MER (lb/yr)	BELOW MER?
Acetaldehyde	4.90E-01	9.75E+02	1.11E+03	Yes
Acrylonitrile	3.40E-04	6.80E-01	3.58E+01	Yes
1,4-Dioxane	1.50E-03	2.95E+00	5.31E+03	Yes
Ethylene Oxide	1.50E-04	<b>3.00E-01</b>	<b>8.00E-02</b>	No
Formaldehyde	6.30E-01	<b>1.26E+03</b>	<b>2.67E+02</b>	No
Methanol	6.60E-01	1.31E+03	3.01E+04	Yes
Methyl Methacrylate	3.40E-01	6.79E+02	1.70E+05	Yes
Vinyl Acetate	3.71E+00	7.41E+03	4.87E+04	Yes
Benzene, 1,2,3,4,5,6-hexachloro-	9.30E-03	<b>1.85E+01</b>	<b>4.87E+00</b>	No
Ethanolamine	1.34E+00	2.68E+03	2.21E+04	Yes
Dipropylene Glycol Methyl Ether	7.00E-01	1.39E+03	6.95E+04	Yes

Total emissions including the new RUM line indicate that potential emissions of ethylene oxide, formaldehyde, and hexachlorobenzene (an ink component for RPM flexographic printing) exceed the MER. To demonstrate that facility-wide emissions remain below the AAC, prior modeling analyses were updated by adapting the original dispersion modeling analyses with an emphasis on “as-built” updates to the existing two RPM lines and inclusion of one new RUM line.

The facility performed a refined modeling analysis using the EPA’s Industrial Source Complex Short Term (Version 3) (ISCST3) modeling system following the procedures specified in sections 3, 4, and 6 of Georgia EPD’s guideline.

The following table summarizes the results of the analyses, demonstrating that refined air dispersion modeling simulates MGLC lower than applicable AAC. Therefore, no adverse impacts of TAP are expected.

#### TAP MGLC Assessment

TAP	Averaging Period*	AAC ( $\mu\text{g}/\text{m}^3$ )	Max Modeled Conc. ( $\mu\text{g}/\text{m}^3$ )*	Receptor UTM Zone: <u>16</u>	
				Easting (meter)	Northing (meter)
ethylene oxide	Annual	0.00033	0.00006	765,600.00	3,700,050.00
	15-minute	900	0.0041844	765,500.00	3,699,950.00
formaldehyde	Annual	1.10	0.27219	765,600.00	3,700,050.00
	15-minute	245	19.573356	765,500.00	3,699,950.00
hexachlorobenzene	Annual	0.02	0.00373	765,600.00	3,700,050.00

\*All maximum modeled concentrations are the domain-wide maximum values among the maximum values across 5-years at receptors.

**Summary & Recommendations**

Georgia-Pacific Corrugated LLC – McDonough Mailers in McDonough is considered a synthetic minor source due to the 100 tpy facility wide emission limit on VOC, 25 tpy emission limit on combined HAPs and 10 tpy emission limit on any single HAP. The Public Advisory expired on April 26, 2024. As a synthetic minor source, compliance responsibility is assigned to SSCP. I recommend issuance of Air Permit Amendment No. 2677-151-0061-S-01-1 to the Georgia-Pacific Corrugated LLC – McDonough Mailers in McDonough.

**Addendum to Narrative**

The 30-day public review started on month day, year and ended on month day, year. Comments were/were not received by the Division.

//If comments were received, state the commenter, the date the comments were received in the above paragraph. All explanations of any changes should be addressed below.//