



VIA FEDERAL EXPRESS

September 29, 2022
Department of Natural Resources and Environmental Control
Office of the Secretary
Attn: Assistant to the Environmental Appeals Board
89 Kings Highway
Dover, Delaware 19901

**Subject: Appeal of Order No. 2022-A-0017
DuPont Nutrition USA, Inc. - Newark Site**

Secretary Garvin:

International Flavors and Fragrances (IFF), operating as DuPont Nutrition USA, Inc. (DuPont), is in receipt of the Notice of Administrative Penalty Assessment and Secretary's Order (No. 2022-A-0017), dated September 8, 2022, and received September 12, 2022. In accordance with the Public Hearing and Appeal Rights section of this order, IFF is submitting this appeal of the order.

In summary the IFF/DuPont appeal is based upon the following points:

1. DNREC personnel were at the facility during the testing, and based on conversations held that day, the facility and their third-party tester believed the change in the analysis from total hydrocarbons (THC) to non-methane hydrocarbons (NMHC) was acceptable.
2. DuPont believed the facility complied with permit requirements following the completion of the 1/28/2020 test, and continued to operate the Barr & Murphy burner in good faith.
3. DuPont continued to work to improve burner performance by engaging numerous combustion experts, and sharing with DNREC the results of periodic emission monitoring of the burner to demonstrate compliance.
4. DNREC raised the THC limit that was initially included in the permit after determining the burner was not able to meet the initial limits, as they were established by DNREC using the incorrect EPA AP-42 emission factor.

The following sections provide details on the points the facility is appealing.

- **DNREC position:**
 - Background paragraph 4 – Despite knowing the spray dryer was not operating in compliance with the permitted THC emission limits, Respondent continued to operate the spray dryer in full production until October 27, 2020.
 - Finding of Fact 8 – The Department used raw data from the January 28, 2020, stack test to calculate the THC results and determined that THC emissions still exceeded permitted limits with an emission rate of 0.41 lb/hr.

International Flavors & Fragrances Inc.
1301 Ogletown Road
Newark, DE 19711

- Finding of Fact 9 – On September 1, 2020, the Department informed Respondent of its failure to report stack test results for THC for the spray dryer as well as the results of the Department’s calculations using the raw data that showed the spray dryer was not in compliance with the permitted THC emission limit.
- Finding of Fact 10 – Despite knowing the spray dryer was not in compliance with the permitted THC emission limit, Respondent continued to operate the spray dryer until November 11, 2020.

IFF response: DuPont Nutrition USA, Inc. completed a performance test on the Barr & Murphy spray dryer on January 28, 2020, with the report submitted to DNREC on February 24, 2020. During the testing, observed THC concentrations were potentially above the permit limit. This issue was discussed with the DNREC representative on site for the test, and it was understood by both DuPont and their testing contractor Arcadis that testing would continue with an evaluation of NMHC rather than THC; therefore, the facility continued to test following this plan. As such, the report was submitted with an evaluation of NMHC to demonstrate compliance. It was not until DNREC contacted DuPont on September 1, 2020, with their contention that the facility did not successfully complete the performance test that the facility became aware that there was a potential issue. The facility continues to maintain that the January 28, 2020, stack test is valid. Volatile organic compound (VOC) emissions, a criteria pollutant, were in compliance per the January 28, 2020, stack test. Aside from the Regulation 1102 permit, there are no specific regulatory standards for THC (which includes methane emissions) from this type of natural gas fired combustion source.

The site believed emissions of all pollutants evaluated were within permit limits as noted in the February 24, 2020, Compliance Stack Test Report. Further, in the April 3, 2020, NOV issued by DNREC for the performance test on January 22, 2020, DNREC was noted as reviewing the report of the January 28, 2020, test, and gave no indication that any problems had been identified. Additionally, in an e-mail from DNREC received on Thursday, September 22, 2022, the Department stated that it is policy to not provide notification to the facility if a performance test was deemed to demonstrate compliance, and only to notify the facility in the event of a failure. As the facility did not receive any notification about the test status until September 1, 2020, the facility assumed the test was deemed passing, as would be assumed based upon DNREC’s policy.

During the more than six months between the performance test report submittal and the notification of potential issues by DNREC, DuPont continued to operate the Barr & Murphy dryer in good faith, believing that the January 28 test showed the facility complying with all permit conditions. Between September 1, 2020, and November 11, 2020, the Barr & Murphy dryer operated less than 50% of the potential operating hours, running 839 hours out of a possible 1,728 hours.

Of those 839 operating hours, 33% occurred between September 1 and September 14, when DuPont was in discussion with DNREC about the disagreement over whether the January 28 performance test showed compliance, and what was required of the facility. Part of the remaining operating time was spent troubleshooting and attempting to bring the burner into compliance with the permit limits. As part of the troubleshooting efforts, DuPont sought

assistance from burner integrator Stetler and Brink (S&B), burner manufacturer Maxon, equipment supplier Dedert, and in-house combustion equipment experts. Additionally, DuPont made equipment adjustments, such as installation of a mixing plate, to address the high emission levels. Many of these activities require the burner to be operating for the adjustments to be made, and each requires that the burner run to assess whether the implemented change had the desired effect. With each unsuccessful adjustment attempt, additional run time was required so other troubleshooting adjustment activities could be attempted and evaluated.

The burner did not operate at all on the following dates:

- September 28 – 29
- October 7
- October 11 – 15 (plant-wide annual maintenance shutdown)
- October 29
- October 31
- November 3 – 10

The process remained shut down after November 11 until the revised permit was issued on December 1, 2020.

- **DNREC Position**

- Conclusion 3 – For the failure to test for THC per the stack test protocol and report results for THC for the January 28, 2020 spray dryer stack test, Respondents is found to be in violation of Condition 4.1; Condition 4.1.4.2.3 and Condition 4.1.4.2.4 of Permit: APC-1992/0259-OPERATION (NO_x RACT)(Amendment 02).

IFF Response: During the performance of the January 28, 2020, performance test, the potentially elevated THC results were discussed with the DNREC staff members on site and other DNREC personnel who were contacted to discuss the situation. Based upon these discussions, DuPont and their testing contractor Arcadis believed that the report submitted on February 24, 2020, was sufficient to meet all requirements of the facility's operating permit and the approved testing protocol as discussed verbally during the performance test.

- **DNREC Position**

- Conclusion 2 – Respondent is found to be in violation of the hourly THC emission limit of 0.37 lb/hr for the spray dryer set forth in Condition 2.1.2 of Permit: APC-1992/0259-OPERATION (NO_x RACT)(Amendment 02), when stack testing conducted on January 22, 2020, resulted in an estimated emission rate of 19 lb/hr.
- Conclusion 4 – Respondent is found to be in violation of the hourly THC emission limit of 0.37 lb/hr for the spray dryer set forth in Condition 2.1.2 of Permit: APC-1992/0259-OPERATION (NO_x RACT)(Amendment 02), when Department calculations using raw data from the January 28, 2020, stack test, showed an emission rate of 0.41 lb/hr.

IFF Response: DuPont submitted a permit modification application on June 26, 2018, to replace the existing Barr & Murphy spray dryer burner. This application did not include any proposed limits for THC, based upon an evaluation that determined there were no applicable Federal

standards and that the DNREC VOC standard did not apply. This determination was consistent with the permit for the burner installed at that time, as it did not have a limit for THC or VOC. When the construction permit was issued on May 6, 2019, it included a limit of 0.37 lb/hr and 1.62 tons per rolling 12 months for THC. This limit was determined by DNREC based upon EPA's AP-42 Emission Factors for boilers combusting natural gas (Table 1.4-2).

$$11 \frac{\text{lb THC}}{\text{MMscf}} \times 34 \frac{\text{MMBtu}}{\text{hr}} \times \frac{1 \text{ scf}}{1,020 \text{ BTU}} = 0.37 \frac{\text{lb THC}}{\text{hr}}$$

For comparison, the 2017 stack test resulted in an average THC emission rate of 0.4 lb/hr. This burner was a 30 MMBtu/hr, while the low nitrogen oxide (low-NO_x) burner installed in 2019 is a 34 MMBtu/hr burner. The DNREC limit established in the permit issued May 6, 2019, was less than the values seen in the stack test on a smaller piece of equipment with a different design (low-NO_x v. not low-NO_x). The limit that DNREC established was significantly more restrictive than the 2017 test would indicate was appropriate. It also did not include any contingency, as is typical when establishing permit limits, to account for variability in operations.

The previous burner was a different design and was not low-NO_x. It minimizes carbon monoxide (CO) and THC emissions but with higher NO_x generation. Low-NO_x burners, such as the one installed in 2019, are designed to control air and fuel mixing in a manner to create more branched and larger flames. This reduces the flame temperature, which results in significantly less NO_x formed in the process. The current burner minimizes NO_x emissions, but in doing so generates higher CO and THC emissions. Therefore, this test point was not appropriate for use in establishing a permit limit on a low-NO_x burner. Applying an emission limit from one technology to another does not follow good engineering practice.

The emission factor for VOCs in AP-42 Table 1.4-2 has a "C" rating and the factor for total organic carbon (TOC) has a "B" rating. AP-42 factors are graded on accuracy and reliability from E to A, with E being the least and A being the most. From the introduction to AP-42 found at <https://www.epa.gov/sites/default/files/2020-09/documents/c00s00.pdf>:

Average emissions differ significantly from source to source and, therefore, emission factors frequently may not provide adequate estimates of the average emissions for a specific source. The extent of between-source variability that exists, even among similar individual sources, can be large depending on process, control system, and pollutant. Although the causes of this variability are considered in emission factor development, this type of information is seldom included in emission test reports used to develop AP-42 factors. As a result, some emission factors are derived from tests that may vary by an order of magnitude or more. Even when the major process variables are accounted for, the emission factors developed may be the result of averaging source tests that differ by factors of five or more.

Emission factors with a "C" rating are, at best, average, and therefore cannot be assumed to be the maximum emission factor at which any piece of equipment in this category may operate. However, this factor was applied by DNREC as the maximum for this burner.

- **DNREC Position:**

- Assessment of Penalty 5 – Economic Benefit or Savings Resulting from the Violation(s): Respondent incurred a significant economic benefit in finished good sales by operating the spray dryer in full production for 9 months after the second failed stack test of January 28, 2020. A significant penalty was assessed for this matter based on the economic benefit in the profit on finished good sales.

IFF Response: The Newark site dryers manufactures products that feed a variety of industries including the pharmaceutical industry. The Barr & Murphy dryer makes pharmaceutical products at times that cannot be produced on other equipment in Newark or at other IFF sites. Customers usually cannot substitute these products for other products due to regulations in the pharmaceutical industry. Some of the end uses of products manufactured are as part of Covid test kits, children's chewable tablets, liquid formulations, and nasal sprays. As stated above in previous responses, operations of the spray dryer at all times was in good faith and at no time was the "economic benefit" considered as a reason to continue operation as the site believed it was in compliance. In fact, the site incurred a significant negative economic impact and some delay in supplying our customers as a result of not operating from November 11 – December 1, 2020, while waiting for DNREC to review and issue the permit for the higher THC limit currently in effect.

Additional Key Points:

- Following the notification by DNREC that they believed the facility failed the performance test in September 2020, DuPont undertook an additional informal investigation of the burner operation and associated testing data. At that time, it was found that even when the burner was down and the system was not in operation, there was a THC concentration in the stack of 2 – 3 ppm. In October 2020, an informal survey was conducted of the surrounding area using a portable THC meter. This survey found THC levels of 2 – 5 ppm at the Lowe's home improvement store approximately 1 mile east of the DuPont facility and at the Wawa convenience store approximately 1 mile west of the DuPont facility. At the time of this survey, the wind was not blowing from DuPont toward either of these locations. The facility notified Delmarva Power, the site's natural gas supplier. Delmarva then conducted their own survey of the facility and the area and could not pinpoint the origin of the THC. The findings from these informal surveys are indicative of a source of THC separate from DuPont. The Barr & Murphy burner is not capable of destroying any THC in ambient air, and any THC in the combustion air will be passed through the burner and be detected in the stack. The ambient level of THC in the local area must be considered when evaluating the results of the stack test.

During the January 28, 2020, performance test, the average THC concentration in the stack for each of the test runs was:

- Run 1 – 5.94 ppmv, dry, at 34,568 dscfm
- Run 2 – 6.61 ppmv, dry, at 33,449 dscfm
- Run 3 – 6.54 ppmv, dry, at 34,322 dscfm
- Average THC 0.41 lb/hr, as calculated by DNREC

September 29, 2022

Secretary Garvin

Page 6 of 6

If an ambient concentration of 2 ppm is subtracted from the tested concentration, the results of the test runs would have been:

- Run 1 – 3.94 ppmv, dry, at 34,568 dscfm, 0.245 lb/hr THC
- Run 2 – 4.61 ppmv, dry, at 33,449 dscfm, 0.287 lb/hr THC
- Run 3 – 4.54 ppmv, dry, at 34,322 dscfm, 0.29 lb/hr THC

In summary, as seen by these calculations, the ambient THC levels should be considered when evaluating burner performance.

- On December 1, 2020, DNREC issued a revised permit for the Barr & Murphy burner, which increased the THC limit to 1.38 lb/hr and 6.05 tons per rolling 12 months. Ultimately, these permit values are an acknowledgement that the initial permit values were inappropriate for the application and clearly incorrect. At no time was the dryer operated above what was eventually determined to be the correct and appropriate permit values for the application. The site worked along with DNREC to resolve the situation as promptly and earnestly as possible. A fine for exceedance of the incorrect permit values while working closely with the agency to address the situation and establish correct higher limits does not seem appropriate.

The Newark Facility continues to operate the Barr & Murphy Spray Dryer in compliance with the facility's Title V operating permits and associated Regulation 1102 permits, including APC-1992/0259-OPERATION (NO_x RACT) (Amendment 3).

Considering the above, IFF/DuPont does not believe the penalty "is proportional to the violations" or serves the stated intent of deterring "Respondent and those similarly situated from engaging in future violations". The facility spent time and money working toward ensuring compliance with the permit limit, through working with burner and combustion specialists, additional logging of emissions levels in the stack on at least a monthly basis, and several weeks of downtime when it was found that the permit limit incorrectly set by DNREC could not be met. The monthly monitoring data were provided to DNREC in the facility's semi-annual deviation reports and annual compliance certification to demonstrate the operation of the burner was meeting permit limits. The 2022 data also were provided to DNREC by e-mail on August 30, 2022.

If you have any questions or require any additional information, please contact Gwen Lawless at gwendolyn.lawless@iff.com or 302-466-4449.

Sincerely,



Gregory Sherman
Plant Manager

c: Angela Marconi, DNREC
Karen Mattio, DNREC
Luke Stirparo, DNREC
Tom Webster
Christine Lhulier

International Flavors & Fragrances Inc.
1301 Ogletown Road
Newark, DE 19711