NARRATIVE

TO: Heather Brown
FROM: Wendy Troemel
DATE: May 4, 2022

Facility Name: Janssen Pharmaceutical, Inc.
AIRS No.: 059-00024
Location: Athens, GA (Clarke County)
Application #: 28296
Date of Application: February 15, 2022

Background Information

Janssen Pharmaceutical, Inc. is an existing synthetic minor pharmaceutical production source operating under Air Quality Permit No. 2834-059-0024-S-05-0 issued August 1, 2016, and Permit Amendment No. 2834-059-0024-S-05-1 issued September 27, 2017. The facility is limited by the Permit to emissions not to equal or exceed: 10 tons annually of any single HAP; 25 tons annually of any combination of HAPs; and 100 tons annually each of NOX, PM, VOC, CO, or SO2.

Purpose of Application

Application No. 28296 was received on February 15, 2022. A public advisory was issued on March 4, 2022 and ended on April 1, 2022. No comments were received.

Janssen plans to modify the facility by removing existing Boilers A & B, rated at 6.28 MMBtu/hr each, and replacing them with Boilers E & F, rated at 14.5 MMBtu/hr (300 hp) each. The facility also plans to install a N2O4 production line, consisting of a reactor vessel, several cooling and storage vessels, and a wet scrubber SR001.

Process Description

Both new boilers will fire natural gas with fuel oil backup during natural gas curtailment periods only. They both will utilize low NOx burners in order to comply with Georgia Rule 391-3-1-.02(2)(III).

Due to supply chain issues, Janssen plans to install a N2O4 line for internal use only (not for sale). The N2O4 line will operate as a R&D capacity for the first 12-24 months while the product goes through product testing and approval before starting as a full-scale production likely in 2024. The process involves oxidizing anhydrous ammonia with superheated air using a palladium-catalyst mesh to form NO2, which is cooled, dewatered, chilled, and condensed to form N2O4. Caustic scrubber SR001 will be used for worker safety, to reduce NO2 emissions, and for controlling emissions of any unreacted ammonia during startup.
It is a continuous operation, with 4 startups per year. Startup is estimated to last 30 minutes, during which any unreacted ammonia will be sent to the scrubber.

During the R&D phase, the facility anticipates making 1,000 lbs, which equates to 0.09 tons of uncontrolled NO₂ emissions. Once the facility has approval to produce, production is expected to be 50 tons/year, at 208 days/year. Maximum production would be 105 tons/year. Uncontrolled NO₂ emissions are 16 tons/year; actual controlled emissions are expected to be less than 1 ton/year.

**Equipment List**

The following equipment will be installed as a result of this modification.

Also, the description of “700 hp boiler” will be replaced with “Boiler D” throughout the Permit.

<table>
<thead>
<tr>
<th>Source Code</th>
<th>Description</th>
<th>Source Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₂O₄</td>
<td>N₂O₄ production line</td>
<td>SR001</td>
<td>Wet Scrubber</td>
</tr>
</tbody>
</table>

**Fuel Burning Equipment**

<table>
<thead>
<tr>
<th>Source Code</th>
<th>Input Heat Capacity (MMBtu/hr)</th>
<th>Description</th>
<th>Installation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>14.5 MMBtu/hr</td>
<td>Natural gas Boiler, Fuel oil backup</td>
<td>2022</td>
</tr>
<tr>
<td>F</td>
<td>14.5 MMBtu/hr</td>
<td>Natural gas Boiler, Fuel oil backup</td>
<td>2022</td>
</tr>
</tbody>
</table>

**Emissions Summary**

The facility utilized AP-42 factors for natural gas and fuel oil usage in the new boilers, 8,760 hr/yr on natural gas and 720 hr/yr on fuel oil. Janssen uses 15 ppm ultra-low sulfur fuel oil, versus the 0.5% by weight sulfur requirement. Plantwide potential emissions for SO₂ is based on the maximum amount of permitted fuel oil at 2.5 MMgal/year, which does not change (although they actually use much less). Actual SO₂ emissions will change due to the larger new boilers.

NO₂ emissions are controlled in the scrubber using NaOH and Bionoxsolver. The scrubber is a combination scrubber with a venturi educator followed by a packed bed scrubber. The facility assumed a scrubber efficiency of 90%.
Facility-Wide Emissions
(in tons per year)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Potential Emissions</th>
<th>Actual Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before Mod.</td>
<td>After Mod.</td>
</tr>
<tr>
<td>PM/PM$<em>{10}$/PM$</em>{2.5}$</td>
<td>5.58</td>
<td>6.75</td>
</tr>
<tr>
<td>NO$_x$</td>
<td>63.20</td>
<td>64.91</td>
</tr>
<tr>
<td>SO$_2$</td>
<td>89.20</td>
<td>89.20</td>
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<tr>
<td>CO</td>
<td>17.00</td>
<td>23.35</td>
</tr>
<tr>
<td>VOC</td>
<td>&lt;100</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Max. Individual HAP</td>
<td>&lt;10</td>
<td>&lt;10</td>
</tr>
<tr>
<td>(methanol)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total HAP</td>
<td>&lt;25</td>
<td>&lt;25</td>
</tr>
</tbody>
</table>

Regulatory Applicability

**FEDERAL RULES**

**Title V Operating Permit (40 CFR Part 70)**

The facility has accepted several synthetic minor limits of less than 10 tons per year of any individual HAP, less than 25 tons per year of total HAP, and less than 100 tons annually each of NO$_x$, PM, VOC, CO, or SO$_2$ to remove itself from applicability to the Title V program.

**40 CFR 60 Subpart Dc – NSPS for Small Industrial-Commercial-Institutional Steam Generating Units**

Existing Boiler D and new Boilers E and F are subject to 40 CFR 60 Subpart Dc as they are rated between 10 MMBtu/hr and 100 MMBtu/hr and were constructed after June 9, 1989. However, the units are restricted to firing natural gas except during periods of natural gas curtailment, so the PM, opacity, and SO$_2$ emission limitations and associated monitoring do not apply. If they burn fuel oil, it is restricted to 0.5% distillate oil as defined by ASTM D396. The facility will be required to maintain records of monthly fuel usage, submit semi-annual reports stating that any combusted fuel oil is distillate oil, and submit initial notifications for the startup of the new boilers.

**GEORGIA RULES**

**Georgia Rule 391-3-1-.02(2)(b) – Visible Emissions**

Georgia Rule (b) limits the opacity of emissions from any source to less than 40%, unless a more restrictive limit applies. The rule will apply to all process equipment at the facility. Violation of the rule is not likely due to the nature of the process.

**Georgia Rule 391-3-1-.02(2)(d) – Fuel-Burning Equipment**

Georgia Rule (d) contains provisions for PM, opacity, and NO$_x$ emissions from fuel-burning equipment. Existing Boiler D and new Boilers E and F are constructed after January 1, 1972 and have a heat input capacity of greater than 10 MMBtu/hr but less than 250 MMBtu/hr. The filterable PM emissions from each boiler is limited to 0.5(10/R)$^{0.5}$ lb/MMBtu heat input.
Georgia Rule (d) also limits the opacity from the boilers to less than 20% opacity (6-minute average), except for one 6-minute period per hour of not more than 27% opacity. These units will not be subject to the NO\textsubscript{X} limit under 391-3-1-.02(2)(d)4 because the capacity is less than 250 MMBtu/hr.

**Georgia Rule 391-3-1-.02(2)(e) - Particulate Matter Emissions from Manufacturing Processes**
Georgia Rule (e) limits the emissions of particulate matter on a pound per hour basis from a source based on the ton per hour of material input. The rule applies to all process equipment at the facility. Violation of the rule is not likely due to the nature of the process.

**Georgia Rule 391-3-1-.02(2)(g) – Sulfur Dioxide**
Georgia Rule (g) limits the sulfur content of fuel burned in a unit below 100 MMBtu/hr to 2.5 percent or less. The facility will only fire natural gas, with distillate oil as a backup during times of natural gas curtailment, in the boilers, which subsumes this limit and ensures compliance.

**Georgia Rule 391-3-1-.02(2)(n) – Fugitive Emissions**
Georgia Rule (n) limits the opacity of fugitive emissions to 20% and requires the facility to take precautions to prevent dust from becoming airborne. It is not likely this rule would be violated because all operations are in an enclosed building.

**Georgia Rule 391-3-1-.02(2)(lll) – NO\textsubscript{X} Emissions from Fuel-Burning Equipment**
Georgia Rule (lll) limits NO\textsubscript{X} emissions from boilers with a heat input capacity between 10 and 250 MMBtu/hr installed after May 1, 1999 in specific counties (Clarke County included). The boilers at this facility are limited to 30 ppm at 3% O\textsubscript{2} on a dry basis during the months of May through September every year.

*NOT APPLICABLE OR EXEMPTED FROM*

**40 CFR 63 Subpart GGG – NESHAP for Pharmaceutical Production**
As this facility is a minor source for HAP, this rule does not apply.

**40 CFR 63 Subpart JJJJJ – Area Source NESHAP for Industrial, Commercial, and Institutional Boilers**
40 CFR 63 Subpart JJJJJ applies to each boiler at area sources of HAP. However, under §63.11195(e), gas-fired boilers, as defined in §63.11237, are not subject to Subpart JJJJJ. Under §63.11237, a gas-fired boiler is defined as “any boiler that burns gaseous fuels,” which includes natural gas. Gas-fired boilers also include those units that burn oil during curtailment. Because the boilers at the facility meet this definition, they are not subject to 40 CFR 63 Subpart JJJJJ.

**40 CFR 63 Subpart VVVVV – Area Source NESHAP for Chemical Manufacturing**
There is no HAP present in the N\textsubscript{2}O\textsubscript{4} production line; therefore this rule does not apply.

**40 CFR 60 Subpart G and Ga – NSPS for Nitric Acid Plants**
While the process to make N\textsubscript{2}O\textsubscript{4} is similar to the process to make nitric acid, the N\textsubscript{2}O\textsubscript{4} production unit does not meet the definition of a nitric acid production plant. This rule does not apply.

**Georgia Rule 391-3-1-.02(2vvv) – Volatile Organic Liquid Handling and Storage**
This rule does not apply in Clarke County.
Permit Conditions

Permit Condition 2.4 was modified to include the 2 new boilers that are subject to the requirements of Georgia Rule 391-3-1-.02(2)(III).

Permit Condition 2.5 was modified to include the 2 new boilers that are subject to the PM and opacity requirements of Georgia Rule 391-3-1-.02(2)(d).

Permit Condition 2.6 was modified to include the 2 new boilers that are subject to 40 CFF 60 Subpart Dc.

Permit Condition 2.7 was modified to include the 2 new boilers that are restricted to firing only 0.5% weight sulfur fuel oil under 40 CFF 60 Subpart Dc.

New Permit Condition 2.8 restricts all boilers on site (including the 2 new boilers) to firing natural gas only in order to remove the facility from applicability to 40 CFR 63 Subpart JJJJJJ.

Permit Condition 4.1 was modified to require the facility to operate the new SR001 scrubber at all times the associated process equipment is in operation.

Permit Conditions 5.2 and 5.3 were modified to include the monitoring parameters and values for the new SR001 scrubber.

Permit Condition 5.6 was modified to include the new boilers for the annual NOX tune-up required under Georgia Rule (III).

Permit Condition 7.5 was modified to include the new boilers in the monthly fuel usage records requirements under 40 CFR 60 Subpart Dc.

New Permit Condition 7.10 outlines the recording requirements for using fuel oil in the boilers.

New Permit Condition 7.11 requires the facility to follow 40 CFR 60 Subpart Dc for notification of construction and startup of the new boilers.

New Permit Condition 7.12 requires the facility to provide notification of operation of the new N2O4 line.

Toxic Impact Assessment

A Toxic Impact Assessment was not performed as the N2O4 line and new boilers involve only a trace of HAP-containing materials (in the natural gas usage). The largest HAP emission is hexane at an estimated 1.8 tpy and the hexane MER is 85 tpy.
Summary & Recommendations

I recommend issuance of Permit Amendment No. 2834-059-0024-S-05-2 to Janssen Pharmaceutical, Inc. which is located at 1440 Olympic Drive in Athens (Clarke County). This permit allows for the replacement of existing Boilers A and B (rated at 6.28 MMBtu/hr each) with new Boilers E and F (rated at 14.5 MMBtu/hr each) that fire natural gas with fuel oil backup; the construction and operation of a N₂O₄ production line for in-house use, including a wet scrubber (SR001) and several vessels. The SSCP will continue to be responsible for compliance and inspection of this facility. The platform was reviewed for accuracy.