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*Transmitted via electronic mail delivery*

**DATE**  
27 March 2026

**SUBJECT**  
Response to DEC's February 27, 2026 Request for Additional Information; Goodyear Manufacturing Plant; DEC ID No. 9-2911-00036

**REFERENCE**  
0771139

Dear Ms. Czechowicz:

On behalf of The Goodyear Tire & Rubber Company's ("Goodyear") Niagara Falls manufacturing facility (the "Facility"), ERM Consulting & Engineering, Inc. ("ERM") is providing this response to the February 27, 2026 letter Request for Additional Information (RAFI) issued by the New York State Department of Environmental Conservation ("NYSDEC", "DEC" or the "Department") concerning the select documents included in the application to modify and renew the Facility's Air State Facility (ASF) Permit (DEC ID No. 9-2911-00036) (hereafter the "Permit").

For the Department's ease of review, we have provided the following table that lists each of the Department's comments and Goodyear's corresponding response to each comment.

DEC Comment	Goodyear Response
<u>AERMOD Air Dispersion Modeling Protocol &amp; Part 212 Analysis</u>	
<p>DEC Comment 1. With the revised permit application package, please submit a revised AERMOD air dispersion modeling protocol &amp; Part 212 analysis (protocol). Within the revised protocol, please add a section that includes the point-by-point responses to the comments on the protocol provided by NYSDEC. This section shall include the responses provided as "Comments on the Air Quality Modeling Protocol, dated August 1, 2025" with the September 15, 2025 Air State Facility application and the responses to the comments provided in this letter.</p>	<p>Goodyear Response: In its September 15, 2025 Air State Facility application, Goodyear included a revised AERMOD Air Dispersion Modeling Protocol &amp; Part 212 Analysis (the "Protocol") that incorporated the Department's comments on the Protocol in its August 1, 2025 correspondence. Attachment A to this response letter is a revised Protocol that includes those revisions to the Protocol and the revisions to the Protocol requested in the Department's February 27, 2026 RAFI letter.</p>

DEC Comment	Goodyear Response
<p>DEC Comment 2. Please add a section to the revised modeling protocol that discusses the cumulative inhalation cancer risk of aniline and o-toluidine. Aniline and o-toluidine are cancer-causing chemicals that have similar physical and chemical properties. Consequently, in the modeling report, please provide an estimation of the cumulative inhalation cancer risk of aniline and o-toluidine by doing the following:</p> <ul style="list-style-type: none"> <li>i. Model aniline and o-toluidine individually.</li> <li>ii. Estimate the inhalation cancer risk of aniline (<math>Risk_A</math>) and o-toluidine (<math>Risk_{O-T}</math>) using the following equations:</li> </ul> $Risk_A \text{ (unitless)} = C_A \text{ (}\mu\text{g/m}^3\text{)} \div AGC_A \text{ (}\mu\text{g/m}^3\text{)}$ $Risk_{O-T} \text{ (unitless)} = C_{O-T} \text{ (}\mu\text{g/m}^3\text{)} \div AGC_{O-T} \text{ (}\mu\text{g/m}^3\text{)},$ <p>where <math>C_A</math> and <math>C_{O-T}</math> are the annual maximum modeled concentrations of aniline and o-toluidine, respectively, and <math>AGC_A</math> and <math>AGC_{O-T}</math> are the annual guideline concentrations of aniline and o-toluidine, respectively.</p> <ul style="list-style-type: none"> <li>iii. Estimate the cumulative inhalation cancer risk (<math>Risk_T</math>) of aniline and o-toluidine using the following equation:</li> </ul> $Risk_T = Risk_A + Risk_{O-T}$ <p>If <math>Risk_T</math> is less than a one-in-a-million inhalation cancer risk (i.e., <math>1 \times 10^{-6}</math>), no further action is needed. If <math>Risk_T</math> is greater than <math>1 \times 10^{-6}</math>, Goodyear shall:</p> <ul style="list-style-type: none"> <li>i. Demonstrate the degree of air cleaning requirements specified in 6 NYCRR Part 212 are being met for both contaminants, or</li> <li>ii. Successfully demonstrate the use of Toxics Best Available Control Technology (T-BACT) for emission sources of aniline and o-toluidine.</li> </ul> <p>For the above scenarios, <math>Risk_T</math> is allowed to be a 10-in-a-million inhalation cancer risk (i.e., <math>1 \times 10^{-5}</math>).</p>	<p>Goodyear Response: The AERMOD Protocol &amp; Part 212 Analysis has been updated to include a section/discussion that addresses the Department's request to conduct a cumulative inhalation cancer risk of aniline and o-toluidine following the methodology provided in the February 27, 2026 RFAI letter. Please note that while neither aniline nor o-toluidine exceeds their respective annual maximum emission limit (MELs) and are not required to be subject to modeling, Goodyear has opted to include both of these air contaminants in its modeling analysis to demonstrate that the facility-wide emissions of these air contaminants are predicted to not cause offsite impacts above their AGCs.</p>

DEC Comment	Goodyear Response
<p>DEC Comment 3. Table 4-1 and Table 4-2: Please include the calculated numerical values for the maximum actual emissions for each contaminant.</p>	<p>Goodyear Response: Tables 4-1 and 4-2 of the updated AERMOD Protocol (Attachment A) have been revised to include the maximum actual emissions for each air contaminant.</p>
<p>DEC Comment 4. Table 4-2: CAS# 122-39-4 has no toxicity classification assigned to it. Therefore, please change its toxicity class to "None". Chemicals with a moderate toxicity classification or no toxicity classification are given an environmental rating of B. CAS# 68953-84-4 is not listed in DAR-1. All chemicals emitted by process operations and not listed in DAR-1 need to be reviewed by the Air Toxics Section (ATS). The results of the ATS's review of CAS# 68953-84-4 are provided in comment 6.</p>	<p>Goodyear Response: Table 4-2 has been updated to reflect the "None" toxicity classification for CAS# 122-39-4, the toxicity classification for CAS# 68953-84-4 has been assigned a "Moderate" classification and a "B" environmental rating; and the AGC and SGC for this air contaminant that was assigned by the DEC's Air Toxics Section (ATS) has also been incorporated into Table 4-2.</p>
<p>DEC Comment 5. Table 4-2: The EPA TANKS input data provided to NYSDEC on December 23, 2025 included cresol (o) (2-methyl-phenol) and mixed xylidines. These contaminants are not included in the AERMOD protocol. If cresol (o) (2-methyl-phenol) or mixed xylidines are being emitted by process operations, please include these contaminants in the Part 212 analysis/ AERMOD protocol and list them in Table 4-2.</p>	<p>Goodyear Response: The use of cresol (o) (2-methyl-phenol) and mixed xylidines has been eliminated from manufacturing of products at the Facility that included these constituents. As such, there is no need to include these constituents in the Facility's air emissions inventory or in the revised AERMOD Protocol &amp; Part 212 Analysis.</p>

DEC Comment	Goodyear Response														
<p>DEC Comment 6. Table 5-1: Nailax's CAS number is 68953-84-4, and it is not listed in DAR-1. As stated in comment 4, all chemicals emitted by process operations and not listed in DAR-1 need to be reviewed by the ATS. The results of the ATS's review are below.</p> <table border="1" data-bbox="167 583 846 642"> <thead> <tr> <th>Chemical Name</th> <th>CAS #</th> <th>AGC (µg/m<sup>3</sup>)</th> <th>SGC (µg/m<sup>3</sup>)</th> <th>Toxicity Classification</th> <th>MEL (lbs/yr)</th> <th>Env. Rating</th> </tr> </thead> <tbody> <tr> <td>Nailax</td> <td>68953-84-4</td> <td>4.0</td> <td>2,400</td> <td>MODERATE</td> <td>100</td> <td>B</td> </tr> </tbody> </table> <p>Appendix D-1 of the protocol shows that the facility-wide actual annual emission rate for Nailax is 44 lbs/yr, which is less than its MEL of 100 lbs/yr. Therefore, modeling is not required for this chemical. Please include the results of the ATS's review in Section 5.1 in the revised protocol.</p>	Chemical Name	CAS #	AGC (µg/m <sup>3</sup> )	SGC (µg/m <sup>3</sup> )	Toxicity Classification	MEL (lbs/yr)	Env. Rating	Nailax	68953-84-4	4.0	2,400	MODERATE	100	B	<p>Goodyear Response: Table 5-1 has been updated to include the CAS number for Nailax and the results of ATS's review and assignment of an AGC and SGC have been incorporated into Tables 4-1 and 4-2 and Section 5.1 of the revised AERMOD Protocol &amp; Part 212 Analysis (Attachment A)</p>
Chemical Name	CAS #	AGC (µg/m <sup>3</sup> )	SGC (µg/m <sup>3</sup> )	Toxicity Classification	MEL (lbs/yr)	Env. Rating									
Nailax	68953-84-4	4.0	2,400	MODERATE	100	B									
<p>DEC Comment 7. Figure 5.3: Please add the recycling tanks description following Figure 5.3: Unreacted raw material from the product manufacturing process is recovered and recycled back into the manufacturing process. The recycle material composition varies based on the variability of recovered and recycled unreacted raw materials from the batch manufacturing process, but recent recycled raw material composition testing conducted at the Facility provides the average weight percentages of the following raw materials:</p> <ul style="list-style-type: none"> <li>● 33.09% O-Xylene</li> <li>● 13.28% Aniline</li> <li>● 13.12% Phenol</li> <li>● 22.49% O-Toluidine</li> <li>● 0.61% Hydroquinone</li> <li>● 2.93% Nailax</li> <li>● 1.88% Water</li> </ul>	<p>Goodyear Response: The description of the recycling tanks and the listing of the average weight percentages of raw materials has been added to the text following Figure 5.3 of the revised AERMOD Protocol (Attachment A).</p>														

DEC Comment	Goodyear Response
<p>DEC Comment 8. Section 4: Please evaluate the future Greenhouse Gas (GHG) emissions resulting from this project and add a discussion comparing the current GHG emissions to future GHG emissions. The expected change in GHG emissions resulting from the operation of the thermal oxidizer should be included.</p>	<p>Goodyear Response: Section 4 of the revised CLCPA Analysis (Attachment B) has been revised to include Table 2 and discussion that predicts the predicted minor increase in GHG emissions resulting from the operation of the 4 MMBtu/hr natural gas-fired regenerative thermal oxidizer (RTO). Note that while the addition of the RTO to the facility's operations will result in a modest increase in GHG emissions, emissions of certain HTACs currently will by the Facility will be reduced dramatically to achieve compliance with the Part 212 requirements.</p>
<p>DEC Comment 9. Section 4.4: Please quantify the estimated 2050 GHG emissions.</p>	<p>Goodyear Response: Discussion has been added in Section 4.4 of the Revised CLCPA (Attachment B) that now includes an estimate of GHG emissions for calendar year 2050.</p>
<p>DEC Comment 10. Section 6: Per DEP 24-1, "co-pollutants" include all regulated air contaminants. However, the analysis only discusses HAP emissions from the facility. Please add information and discussion regarding other pollutants emitted from the facility.</p>	<p>Goodyear Response: The tables included in Section 6 of the updated CLCPA Analysis (Attachment B) have been revised to include other regulated air contaminants emitted by the Facility.</p>
<p>DEC Comment 11. Section 6.1: The analysis indicates that there are no published HAP emission factors for diesel/gasoline vehicles. However, as discussed in the mobile emissions addendum to DEP 24-1, the AFLEET tool can be used to determine co-pollutant emissions from vehicle traffic, including gasoline and diesel vehicles. The AFLEET tool does not calculate HAP emissions, but as discussed in the comment above, the 7(3) analyses should include all co-pollutants. Please revise this section to include all co-pollutants.</p>	<p>Goodyear Response: Section 6.1 of the CLCPA (Attachment B) has been revised to reflect the application of the AFLEET Online tool to estimate co-pollutant emissions for onsite vehicles fueled by gasoline and diesel fuel. As stated in Goodyear's response to DEC Comment 11, the 7(3) analysis has been revised to include all co-pollutants in Tables 3 and 4.</p>

DEC Comment	Goodyear Response
<p>DEC Comment 12. Appendix F-2: On the bottom row of the Facility-Wide Direct Actual GHG Emissions tables, “The Total Direct Emissions as CO<sub>2</sub>e” are mislabeled as “Total Upstream Emissions as CO<sub>2</sub>e” for each calendar year.</p>	<p>Goodyear Response: The label on the bottom row of the Facility-wide Direct Actual Emissions tables in Appendix F-2 of the CLCPA (Attachment B) has been corrected.</p>
<p>DEC Comment 13. Appendix F-2: Please revise the emission calculations or provide an explanation for the discrepancies described below. Please note that changing the emission totals will affect the “Grand Total CO<sub>2</sub>e” values and the emissions reported in Table 1 of Section 4.2.1.</p> <p>a. Appendix F-2; 2020: Carbon dioxide equivalents (CO<sub>2</sub>e) upstream emission totals associated with methane (CH<sub>4</sub>) are reported as 2,835 MT /year. NYSDEC has calculated 1,179 MT/year.</p> <p>b. Appendix F-2; 2021, 2022, 2023, and 2024: Both the CO<sub>2</sub>e direct emission totals and upstream emission totals associated with methane are significantly different from what NYSDEC has calculated.</p> <p>For example, in the 2021 Combustion Emissions table, 1,693 MT/year of CO<sub>2</sub>e was reported as the total direct emissions associated with CH<sub>4</sub>. 13.5 MT/year was calculated by NYSDEC.</p> <p>(CH<sub>4</sub> from Natural Gas) + (CH<sub>4</sub> from Propane) + (CH<sub>4</sub> from Diesel) + (CH<sub>4</sub> from Gasoline) = CH<sub>4</sub> total</p> <p>0.16 MT CH<sub>4</sub> + .0009 MT CH<sub>4</sub> + .00008 MT CH<sub>4</sub> + .00003 MT CH<sub>4</sub> = .161 MT CH<sub>4</sub> total</p> <p>0.161 MT CH<sub>4</sub> * 84 (GWP) = 13.5 MT CO<sub>2</sub>e/year from Methane.</p>	<p>Goodyear Response: These discrepancies were caused by a cell reference error in the MS Excel workbook, which was carrying through to other calculations and causing errors in the final calculations. The calculation errors in Appendix F-2 of the revised CLCPA (Attachment B) have been corrected.</p>

DEC Comment	Goodyear Response
<u>Best Available Control Technology (BACT) Evaluation</u>	
<p>DEC Comment 14. Section 5.2.1: Please provide references to the sources used to find the optimal exhaust flow range and used to assert that reduced VOC control efficiency occurs when exhaust flow rates are outside the optimal exhaust flow range.</p>	<p>Goodyear Response: A footnote reference has been added to the discussion on the optimal exhaust gas flow range has been included in Section 5.2.1 of the updated Sparkler Filter BACT Analysis (Attachment C). The reference has also been added to the References Section of the Study report.</p>
<p>DEC Comment 15. "Option 2: Carbon Adsorption": Please add a justification or provide the source for 10% adsorption efficiency used in the calculations.</p>	<p>Goodyear Response: The justification/source for the use of the 10% adsorption efficiency used in the calculations has been added the BACT Analysis Report</p>
<p>DEC Comment 16. "Option 2: Carbon Adsorption": Please revise the "Based on Total Annualized Cost" cost effectiveness value. The "Annualized Capital Cost" is accounted for in the "Total Annualized Cost" and should not be included in the calculation.</p> <p>Based on Total Annualized Cost = Annualized Capital Cost/tons/year</p> <p>Based on Total Annualized Cost= \$81,675.96/year/.005 tons/year</p> <p>Based on Total Annualized Cost = \$16,335,192/ton</p>	<p>Goodyear Response: The cost calculations have been revised to reflect the Department's comment in the updated BACT Analysis (Attachment C).</p>

On behalf of Goodyear, ERM appreciates the Department's review of the ASF application and supporting documents. If you have any questions concerning the information included in this Response to the Department's February 27, 2026 RFAI letter, please contact me at +1.585.387.0510 or via email at [david.murtha@erm.com](mailto:david.murtha@erm.com).

Sincerely,



David T. Murtha, QEP, CVI. TWIC  
Consulting Director

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ATTACHMENT A REVISED AERMOD AIR DISPERSION  
MODELING PROTOCOL & PART 212  
ANALYSIS



# AERMOD Air Dispersion Modeling Protocol & Part 212 Analysis

Goodyear Niagara Falls Facility; DEC ID  
No. 9-2911-00036

PREPARED FOR



The Goodyear Tire & Rubber  
Company

DATE

27 March 2026

REFERENCE

0771139



## DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.

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AUTHOR	Robert Van Kleeck, David Murtha, QEP
CLIENT NAME	The Goodyear Tire & Rubber Company

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Revised Final	002	Nancy Zhou	David Murtha	Gary Keating	03.27.2026	Revisions for DEC RFAI Comments February 2026



# AERMOD Air Dispersion Modeling Protocol & Part 212 Analysis

Goodyear Niagara Falls Facility; DEC ID No. 9-2911-00036  
0771139



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## ACRONYMS AND ABBREVIATIONS

Acronym	Description
AGC	Annual Guideline Concentrations
ASF	Air State Facility Permit
CFR	Code of Federal Regulations
CH <sub>4</sub>	Methane
CLCPA	Climate Leadership and Community Protection Act
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide Equivalents
DAC	Disadvantaged Community

Acronym	Description
DAR-21	Division of Air Resources (21: NYSDEC Program Policy, "The Climate Leadership and Community Protection Act and Air Permit Applications", dated December 14, 2022)
DEP 24-1	Division of Environmental Permits (24-1: NYSDEC Program Policy, "Permitting and Disadvantaged Communities," dated May 8, 2024)
eGRID	Emissions & Generation Resource Integrated Database
ERM	ERM Consulting & Engineering, Inc.
GHG	Greenhouse Gas
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HTAC	High Toxicity Air Contaminant
kWh	Kilowatt-hours
lb/yr	Pounds per year
LED	Light-emitting diode
MACT	Maximum Achievable Control Technology
MT	Metric tonnes
N <sub>2</sub> O	Nitrous Oxide
NYCRR	New York Code, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
O-T	ortho-Toluidine
PM	Particulate Matter
POTW	Publicly Owned Treatment Works
PTE	Potential-to-Emit
PVC	Polyvinyl Chloride
RTO	Regenerative Thermal Oxidizer
SGC	Short-term guideline concentration
tpy	Tons per year
USEPA	United States Environmental Protection Agency

Acronym	Description
VFD	Variable Frequency Drives
VOC	Volatile Organic Compounds

## 1. INTRODUCTION

On behalf of The Goodyear Tire and Rubber Company (Goodyear), ERM submits this Air Dispersion Modeling Protocol and 6 NYCRR Part 212 Applicability Assessment and Goodyear's manufacturing Facility located in the City of Niagara Falls, New York (Facility or Project henceforth) with DEC ID 9-2911-00036. This air dispersion modeling protocol is submitted as part of a permit application for renewal of and modification to the Facility's Air State Facility (ASF) permit.

The majority of the emission sources at the Facility qualify as "process emission sources" that are subject to the requirements of Title 6 of the New York Codes, Rules and Regulations, Part 212 (6 NYCRR Part 212). This regulation includes (but is not limited to) requirements for compound-specific air contaminants (commonly referred to as air toxics) from process emission sources that are subject to permitting. Per 6 NYCRR Part 212-1.1, a facility that has process emission sources must demonstrate compliance with the revised requirements of Part 212 upon issuance of a new or modified permit or registration, or upon issuance of a renewal for an existing air permit or registration.

This document evaluates the applicability of 6 NYCRR Part 212-2 to the facility's emission sources and processes and describes the air dispersion methodology that will be used to evaluate the potential short-term and annual ambient impacts of the emission sources that are subject to Part 212-2. This document has been prepared to fulfill the submission requirements for an air dispersion modelling protocol.

## 2. BACKGROUND

On 14 June 2015, revisions to 6 NYCRR Part 212 (Part 212") became effective that included significant changes to the regulation of air toxics. Tables 3 & 4 of §212-2.3 indicate that air dispersion modeling must be performed to demonstrate that the maximum offsite air concentration is less than the applicable National Ambient Air Quality Standard (NAAQS) or Annual Guideline Concentration (AGC)/Short-term Guideline Concentration (SGC) values. The results of the air dispersion modeling are used to support the environmental rating for each air contaminant, as well as determine the degree of air cleaning required. A subsequent revision to Part 212 became effective on 25 February 2021.

On 10 August 2016, the New York State Department of Environmental Conservation (NYSDEC) also revised and issued NYSDEC Policy DAR-1 ("Guidelines for the Evaluation and Control of Ambient Air Contaminants Under 6 NYCRR Part 212") to provide additional guidance regarding Part 212 implementation and compliance. A subsequent revision to DAR-1 became effective on 12 February 2021.

Table 2 of §212-2.2 provides a list of 61 air contaminants that the NYSDEC has established as "High Toxicity Air Contaminants" (HTACs). For compounds that are regulated as HTACs, §212-2.1(a) states that the facility "shall either limit the actual annual emissions from all process operations at the facility so as to not exceed the mass emission limit listed for the individual HTAC; or demonstrate compliance with the air cleaning requirements for the HTAC as specified in <<Table 4 of §212-2.3(b)>> for the environmental rating assigned to the contaminant by the

department.". For compounds that do not qualify as an HTAC, §212-2.1(b) indicates that the facility "shall not allow emissions of <<the>> contaminant to violate the requirements specified in...Table 3 – Degree of Air Cleaning Required for Criteria Air Contaminant, or...Table 4 – Degree of Air Cleaning Required for Non-Criteria Air Contaminants...for the environmental rating assigned to the contaminant by the department."

For process emission sources that are subject to a Federal New Source Performance Standard (NSPS), §212-1.5(e)(1) states that the Part 212 requirements for the air contaminants that are regulated by the standard are satisfied if the facility owner or operator can demonstrate that the facility is compliant with the NSPS. For process emission sources that are subject to a Federal National Emission Standard for Hazardous Air Pollutants (NESHAP), §212-1.5(e)(2) indicates that the Part 212 requirements for the air contaminants that are regulated by the standard are satisfied if the facility owner or operator can demonstrate that the process emission source is in compliance with the relevant Federal regulation. For those NESHAPs regulating HTACs, the facility owner or operator must provide a Toxic Impact Assessment (TIA) demonstrating that the maximum offsite ambient air concentration is less than the [respective] Annual Guideline Concentration/Short-term Guideline Concentration (AGCs/SGCs) and that emissions are less than the Persistent, Bioaccumulative (PB) trigger for the respective air contaminant.

Based upon an evaluation of the emissions from the Facility, an air dispersion modeling analysis is required for the Facility's Part 212-regulated emissions. The resulting predicted ambient impacts from the modeling analysis will be compared against the respective AGCs/SGCs for each compound.

Section 4.0 of this document provides a detailed discussion regarding the process used to identify the emission sources and contaminants that are subject to Part 212. Section 5.0 provides an air quality modeling protocol that provides ERM's proposed methodology for the air dispersion modeling evaluation.

## 3. FACILITY DESCRIPTION

### 3.1 FACILITY LOCATION

The Facility is located at 5500 Goodyear Drive, in the City of Niagara Falls, Niagara County, New York. The Facility is situated on a 29-acre parcel of land approximately 300 by 500 meters at its widest portions. Access to the Facility is limited by perimeter fencing and security gates.

The Facility is bounded to the south by other manufacturing facilities and to the north by private businesses. To the immediate west of the facility are rail lines and undeveloped land. To the east is 56<sup>th</sup> street and subsequent residential areas.

Significant activities that are located near the Goodyear facility include the following:

- A residential neighborhood, directly across 56<sup>th</sup> street on the eastern property line;
- A daycare facility (Safari Kids Club Daycare), is located approximately 2 kilometers to the west of the Facility;

- A school (Cataract Elementary School), is located approximately 1 kilometer to the east of the Facility;
- A hospital (Niagara Falls Memorial), is located about 4 kilometers to the west of the Facility; and
- An assisted living facility (Niagara Rehabilitation) is located approximately 4.2 kilometers to the west of the Facility.

### 3.2 FACILITY OPERATIONS

The Facility specializes in the manufacture of an antioxidant product that enhances the durability and performance of rubber, particularly in production of vehicle tires. The primary manufacturing equipment associated with the ASF Permit includes pre-mix tanks, a centrifuge, drum flaker, remelt tank, a replacement Tri-Mer® wet scrubber, a new Regenerative Thermal Oxidizer (RTO), and Elimination Tanks. The Facility also has nine tanks that are equipped with conservation vents and used to store raw materials and recycled material used in the manufacturing process. Additionally, the Facility has an onsite wastewater treatment system that removes organics using solvents and a packed-bed air stripper.

Air emission controls at the Facility include activated carbon systems, a vapor recovery system, fabric filters, condensers, a replacement wet scrubber and a new regenerative thermal oxidizer.

## 4. AIR CONTAMINANT EMISSIONS SUBJECT TO 6 NYCRR PART 212

The following steps were used to identify the air contaminants subject to Part 212 that require air dispersion modeling:

1. Identify permitted emission sources that do not qualify as a “process emission sources”;
2. Identify process emission sources that are not subject to Part 212;
3. Identify process emissions that are not subject to Part 212;
4. Identify process emissions that are “conditionally exempt” from Part 212;
1. Classify contaminant emissions as Particulate Matter (PM), Volatile Organic Compound (VOC), Hazardous Air Pollutant (HAP), and high toxicity air contaminant (HTAC) per 6 NYCRR 212-2.2 Table 2;
5. Evaluate maximum annual HTAC emissions from Part 212-regulated process emission sources;
6. Confirm that there are no air contaminant emissions that are regulated by a New Source Performance Standard (NSPS) or National Emissions Standard for Hazardous Air Pollutants (NESHAP);
7. Identify non-HTACs with emissions less than 100 lb/yr; and
8. Identify contaminant emissions that require air dispersion modeling.

The following subsections provide the details for each of the steps identified in this analysis for the permitted processes and emission sources. For this step-by-step analysis, Appendices B-1 and B-2 were used.

Appendix B-1 presents the matrix of emission units, processes, and emission sources reflected in the ASF permit (with additional changes noted via red underlining and strikethrough) and reflects those emission sources that are potentially subject to Part 212. Appendix B-2 provides the maximum annual emission rates for the identified contaminants. The emission values represent the worst-case, annual emission rate for each emission source. For those emission sources that are equipped with emission control, the maximum annual emission rates reflect the maximum emission rate after control.

For those emission sources identified in Appendix B-1 that require modeling, Appendix B-2 provides the maximum hourly emission rate for each emission source or emission point in the process. The emission values represent the worst-case hourly emissions for each emission source. For those emission sources that are equipped with emission control, the maximum hourly emission rates reflect the maximum emission rate after control.

#### 4.1 IDENTIFICATION OF PERMITTED EMISSION SOURCES THAT DO NOT QUALIFY AS A "PROCESS EMISSION SOURCES"

Based upon a review of the processes and emission sources identified in the ASF Permit, all emission sources qualify as "process emission sources". With the exception of sources that are classified as exempt from permitting in accordance with the requirements of Part 201-3.2 and 201-3.3, there are no pieces of equipment that qualify as permissible "stationary combustion installations".

#### 4.2 IDENTIFICATION OF PROCESS EMISSIONS THAT ARE "CONDITIONALLY EXEMPT" FROM PART 212

Under §212-1.4, emissions of VOCs and particulates generated by certain types of regulated processes could be conditionally exempted from Part 212, provided that the NYSDEC does not determine that these air contaminants warrant an environmental rating of "A". For this type of conditional exemption, the NYSDEC requires that air dispersion modeling be performed to demonstrate that the facility emissions of each speciated VOC do not exceed their respective AGC or SGC; only then can the environmental rating identified for each compound in DAR-1 be deemed to be an appropriate rating.

The Goodyear Facility is not eligible for any of the conditional exemptions included in §212-1.4.

#### 4.3 CLASSIFICATION OF AIR CONTAMINANT EMISSIONS AS PARTICULATE MATTER (PM), VOLATILE ORGANIC COMPOUND (VOC), HAZARDOUS AIR POLLUTANT (HAP), AND HIGH TOXICITY AIR CONTAMINANT (HTAC)

Each contaminant was evaluated to determine whether it met any of the following definitions:

- Particulates;

- Volatile Organic Compound (VOC);
- Hazardous Air Pollutant (HAP); and
- High Toxicity Air Contaminant (HTAC) per 6 NYCRR 212-2.2 Table 2.

The regulatory classifications for each contaminant are included in Appendix B-1 and B-2.

#### 4.4 IDENTIFICATION OF GENERAL PARTICULATE EMISSIONS THAT MAY NOT WARRANT A HIGH TOXICITY (“A”) CLASSIFICATION

There are processes at the Goodyear Facility that result in particulate emissions. These particulates include organic compounds as well as other compounds.

Emissions of “B”-rated particulates will be regulated by the particulate standard of §212-2.4(a). Based upon information provided by the NYSDEC, the Department requires that air dispersion modeling be performed to demonstrate that the facility emissions of each speciated particulate do not exceed the applicable AGC or SGC; only then can the environmental rating identified for each compound in DAR-1 be deemed to be an appropriate rating.

For this modeling evaluation, all known compounds comprising “particulate” were identified and speciated for modeling.

#### 4.5 EVALUATION OF MAXIMUM ANNUAL HTAC EMISSIONS FROM PART 212-REGULATED PROCESS EMISSION SOURCES

The following HTACs may be emitted by the Facility’s process emission sources. These compounds are identified in Table 2 (HTAC List) of §212-2.2 with the specified Mass Emission Limits shown below. For those HTAC’s where the maximum annual emissions are greater than the maximum emission limit (MEL) value, an air dispersion modeling analysis will be required. Otherwise, for those HTACs that are less than the MEL value, air dispersion modeling is not required.

Table 4-1: Total Emissions of HTACs from Part 212-Regulated Process Emission Sources

HIGH TOXICITY AIR CONTAMINANT (HTAC)	CAS NO.	ORIGIN OF EMISSIONS	MASS EMISSION LIMIT (lb/yr)	PB TRIGGER	MAXIMUM ACTUAL EMISSIONS (lb/yr)	GREATER OR LESS THAN MEL
Ortho-Toluidine	95-53-4	Process	100	---	279	> MEL
Aniline	62-53-3	Process	1,000	---	319	< MEL

#### 4.6 IDENTIFICATION OF CONTAMINANT EMISSIONS THAT ARE REGULATED BY AN NSPS OR NESHAP

For process emission sources that are subject to a federal NSPS, §212-1.5(e)(1) states that that the Part 212 requirements for the air contaminants that are regulated by the standard are satisfied if the facility owner or operator can demonstrate that the process emission source is in compliance with the NSPS. The Goodyear Facility has emission sources that are subject to 40 CFR Part 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels.



With the capping provisions included in the ASF permit, the Goodyear Facility is not subject to any federal NESHAP requirements.

#### 4.7 IDENTIFICATION OF NON-HTACS WITH EMISSIONS LESS THAN 100 lb/yr

Per Section V-A of DAR-1, a Part 212 evaluation must include each non-HTAC air contaminant emitted at a rate *greater* than 100 lb/yr facility-wide. As shown in Appendix B-1, the maximum annual emissions of the non-HTAC compounds identified below are less than 100 lb/yr except for Ortho-Xylene. Emissions of these air contaminants are subject to Part 212, however, are also presumed to be in compliance with the requirements of Table 4 of §212-2.3. (Air dispersion modeling is not required for these compounds).

Table 4-2: Total Emissions of Non-HTACs from Part 212-Regulated Process Emission Sources (Contaminants Greater Than or Less Than 100 lb/yr)

AIR CONTAMINANT	CAS NO.	PHYSICAL STATE	TOXICITY CLASS	MAXIMUM ACTUAL EMISSIONS (lb/yr)	GREATER OR LESS THAN MEL (100 LB/YR)
Phenol	108-95-2	solid	Moderate	24	< 100
ortho-Xylene	95-47-6	liquid	Moderate	11,634	> 100
Hydroquinone	123-31-9	solid	Moderate	20	< 100
Diphenylamine	122-39-4	solid	None	2.26	< 100
Hydrogen chloride	07647-01-0	gas	Moderate	644	> 100
Nailax**	68953-84-4	solid	Moderate	44	< 100

\*\*DAR-1 does not identify a toxicity classification for this chemical. Nailax emitted by process operations is not a listed chemical in DAR-1, Appendix A. NYSDEC DAR's Air Toxics Section (ATS) reviewed this chemical and provided the AGC and SGC in this table and assigned a classification of "Moderate" to this chemical.

#### 4.8 IDENTIFICATION OF AIR CONTAMINANT EMISSIONS THAT REQUIRE AIR DISPERSION MODELING

Air dispersion modeling is required for the following types of air contaminants that are regulated by or are potentially regulated by Part 212-2:

- HTACs that are emitted at a rate greater than their respective Mass Emission Limit (MEL).
- Air contaminants that are emitted at a rate greater than 100 lb/yr and are not regulated by an applicable NESHAP.

If an air contaminant is subject to a NESHAP, and all emissions of the contaminant from the facility's process emission sources originate solely from NESHAP sources, the air contaminant does not require modeling. Otherwise, if emissions of an air contaminant originate from both NESHAP sources and non-NESHAP sources, the contaminant emissions from all regulated sources (including the NESHAP sources) must be included in the air dispersion model.

According to the criteria above, some contaminants emitted by the facility would not require modeling. Nonetheless, air dispersion modeling will be completed for all known contaminants.

The following table provides a summary of the emission points, emission sources and air contaminants that require air dispersion modeling.

Table 4-3: Emission Points & Contaminants that Require Part 212 Air Dispersion Modeling

EMISSION POINT ID	EMISSION SOURCE ID(s)	EMISSION SOURCE DESCRIPTION	AIR CONTAMINANT(s) (CAS No.)
Fugitives	Fugitives (Equipment Components)	Fugitive emissions from the facility-wide manufacturing process equipment components	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2)
0C2E0	0C2E0	Air Stripper	Ortho-xylene (00095-47-6)
3393A	3393	Sparkler Filter	Hydroquinone (00123-31-9)
32034	3034	Sparkler Filter	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2) Diphenylamine (00122-39-4) Nailax (68953-84-4)
000N2	0F0N2	Packaging Dust Collector	PM

EMISSION POINT ID	EMISSION SOURCE ID(s)	EMISSION SOURCE DESCRIPTION	AIR CONTAMINANT(s) (CAS No.)
000N3	000N3	Drum Flaker (Tri-Mer Scrubber/RTO)	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2) Diphenylamine (00122-39-4) Hydroquinone (00123-31-9) Hydrogen Chloride (07647-01-0)
		Elimination Tank #1(Tri-Mer Scrubber/RTO)	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2) Diphenylamine (00122-39-4) Hydroquinone (00123-31-9) Hydrogen Chloride (07647-01-0)
		Elimination Tank #2(Tri-Mer Scrubber/RTO)	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2)



EMISSION POINT ID	EMISSION SOURCE ID(s)	EMISSION SOURCE DESCRIPTION	AIR CONTAMINANT(s) (CAS No.)
000N4	0F0N4	Conveyor Dust Collector	Diphenylamine (00122-39-4) Nailax (68953-84-4)
32009	3009	Sump Holding Tank	Ortho-toluidine (00095-53-4) Aniline (00062-53-3) Phenol (00108-95-2)
F0101	0F101	o-Xylene Storage Tank	Ortho-xylene (00095-47-6)
F0103	0F103	Recycle material storage tank	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2)
F0104	0F104	Recycle material storage tank	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2)
F0106	0F106	Aniline storage tank	Aniline (00062-53-3)
F0107	0F107	Recycle material storage tank	Ortho-toluidine (00095-53-4) Ortho-xylene (00095-47-6) Aniline (00062-53-3) Phenol (00108-95-2)



EMISSION POINT ID	EMISSION SOURCE ID(s)	EMISSION SOURCE DESCRIPTION	AIR CONTAMINANT(s) (CAS No.)
F0108	F0108	ortho-Toluidine storage tank	Ortho-toluidine (00095-53-4)
F0109	OF109	Aniline storage tank	Aniline (00062-53-3)
F0110	F0110	ortho-Toluidine storage tank	Ortho-toluidine (00095-53-4)
F0112	F0112	ortho-Toluidine storage tank	Ortho-toluidine (00095-53-4)
F1862	F1862	Solvent Extraction Condenser	Ortho-xylene (00095-47-6)

## 4.9 FUGITIVE EMISSIONS MODELING

Calculations of fugitive emissions involve a combined measurement and emissions estimation methodology. Fugitive emissions of ortho-toluidine were calculated using saturation value methodology, as detailed in ERM's technical memo to the NYSDEC and titled "Ortho-toluidine Fugitive Emission Estimation Approach" dated May 9, 2025 and updated August 29, 2025 that more accurately estimates the equipment component fugitive emissions. The fugitives were calculated based on the Correlation Approach found in the 1995 US EPA document, *Protocol for Equipment Leak Emissions Estimates*.

Through the correlation approach, Goodyear collaborated with Alliance Technical Group to conduct a Leak Detection and Repair (LDAR) assessment of all components at the facility on June 21 through June 23, 2025. This evaluation aimed to deliver a more accurate estimation of the actual fugitive emissions of O-T, aniline and phenol at the facility for the US EPA's Toxic Release Inventory (TRI) reporting and future modeling efforts. The results from the LDAR assessment are outlined in Appendix A. The majority of components did not show any leaks during the assessment. For components with a measured screening value, emissions were determined using the equations provided in Table 2-9 of the US EPA Protocol document. In instances where no emissions were detected, calculations utilized the "default zero" emission rates specified in Table 2-11 of the US EPA Protocol document. By employing this method, the mass fraction of O-T indicates that the total calculated fugitive emissions for O-T is 19.2 pounds per year (lb/yr), aniline is 4.41 lb/yr, phenol is 1.77 lb/yr and o-Xylene is 7.08 lb/yr. The variables utilized in these calculations are detailed in Table 1. Table 2 illustrates the vapor mass fraction used to speciate the VOC emissions and compute O-T emissions.

## 5. AERMOD AIR DISPERSION MODELING PROTOCOL

Based upon the evaluation performed in Section 4.0, an air dispersion modeling assessment must be performed to evaluate the short-term and annual ambient impacts of emissions of two compounds from the facility's Part 212-regulated emission sources: Ortho-toluidine and ortho-xylene. Other pollutants that fell below their respective MEL will be included out of an abundance of caution.

This section provides a discussion regarding the air dispersion modeling approach.

### 5.1 OVERVIEW OF MODELING METHODOLOGY

The ambient concentration of air contaminants are estimated using a dispersion model applied in conformance to applicable guidelines. The methodology proposed in this protocol is based on policies and procedures contained in the USEPA Guideline on Air Quality Models (GAQM, 40CFR Appendix W, 17 January 2021), and NYSDEC Policy "DAR-10 : NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis" (1 September 2020).

The key elements of the air quality impact analysis will be as follows:

- Use the latest version of AERMOD (v.24142) with the regulatory default options in the rural mode;
- Use of surface meteorological data collected at the National Weather Service (NWS) observation station at Niagara Falls International Airport, Niagara Falls, NY (WBAN No. 04724) and upper air data from the NWS observation station in Buffalo, NY (WBAN No. 14733) for the period 2020-2024. These data will be obtained from the NYSDEC;
- Conduct air quality modeling to quantify the magnitude and location of model predicted concentration of Part 212-regulated emissions from the Facility, and
- Compare the predicted impacts of modeled air contaminants to the applicable Annual Guideline Concentration (AGC) and Short-term Guideline Concentration (SGC) values identified in the AGC/SGC tables of NYSDEC's "DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212" (12 February 2021).

Table 5-1 provides a summary of the compounds that are listed in DAR-1 with AGC and/or SGC values. Note that Nailax is not a listed contaminant in DAR-1 Appendix A's AGC/SGC Tables. Since Nailax is not a listed chemical, NYSDEC's Division of Air Resources, Air Toxics Section (ATS) evaluated Nailax for the development of an AGC and SGC. The information in Table 5-1 provides a summary of the AGC/SGC values listed in DAR-1, including the AGC/SGC for Nailax that was developed by ATS.

Table 5-1: Summary of AGC/SGC Values Listed in NYSDEC Policy DAR-1

Air Containment	CAS NO.	HTAC?	MEL (lbs/yr)	SGC ( $\mu\text{g}/\text{m}^3$ )	AGC ( $\mu\text{g}/\text{m}^3$ )
Aniline	00062-53-3	Y	1,000	---	0.63
Diphenylamine	00122-39-4	N	100	---	24
Phenol	00108-95-2	N	100	5,800	20
Ortho-Toluidine	00095-53-4	Y	100	---	0.02
Ortho-Xylene	00095-47-6	N	100	22,000	100
Hydrogen Chloride	07647-01-0	N	100	2,100	20
Hydroquinone	00123-31-9	N	100	--	2.4
Nailax	68953-84-4	N	100	2,400	4.0

As shown in Table 5-1, aniline and ortho-toluidine are HTACs with assigned AGCs. In accordance with DAR-1 Section V.B a cumulative inhalation cancer risk assessment of the HTAC emissions from aniline and ortho-toluidine will be incorporated into the modeling analysis using the following procedure.

1. Aniline and o-toluidine will be modelled individually (as defined above);
2. The inhalation cancer risk of aniline ( $\text{Risk}_A$ ) and o-toluidine ( $\text{Risk}_{O-T}$ ) will be estimated using the following equations:

$$\text{Risk}_A (\text{unitless}) = C_A (\mu\text{g}/\text{m}^3) + \text{AGC}_A (\mu\text{g}/\text{m}^3)$$

$$\text{Risk}_{O-T} (\text{unitless}) = C_{O-T} (\mu\text{g}/\text{m}^3) + \text{AGC}_{O-T} (\mu\text{g}/\text{m}^3)$$

where  $C_A$  and  $C_{O-T}$  are the annual maximum model-predicted concentrations of aniline and o-toluidine, respectively, and  $\text{AGC}_A$  and  $\text{AGC}_{O-T}$  are the annual guideline concentrations of aniline and o-toluidine, respectively.

3. Estimate the cumulative inhalation cancer risk ( $\text{Risk}_T$ ) of aniline and o-toluidine using the following equation:

$$\text{Risk}_T = \text{Risk}_A + \text{Risk}_{O-T}$$

If  $\text{Risk}_T$  is less than a one-in-a-million inhalation cancer risk (i.e.,  $1 \times 10^{-6}$ ), no further action is needed. If  $\text{Risk}_T$  is greater than  $1 \times 10^{-6}$ , Goodyear shall:

- Demonstrate the degree of air cleaning requirements specified in 6 NYCRR Part 212 are being met for both contaminants, or
- Successfully demonstrate the use of Toxics Best Available Control Technology (T-BACT) for emission sources of aniline and o-toluidine.

Note that the Risk<sub>T</sub> of 10-in-a-million inhalation cancer risk (i.e.,  $1 \times 10^{-5}$ ) is allowed.

The results of the cumulative inhalation cancer risk assessment will be included in the combined AERMOD modelling and Part 212 Analysis Report.

## 5.2 FACILITY PROPERTY DESCRIPTION

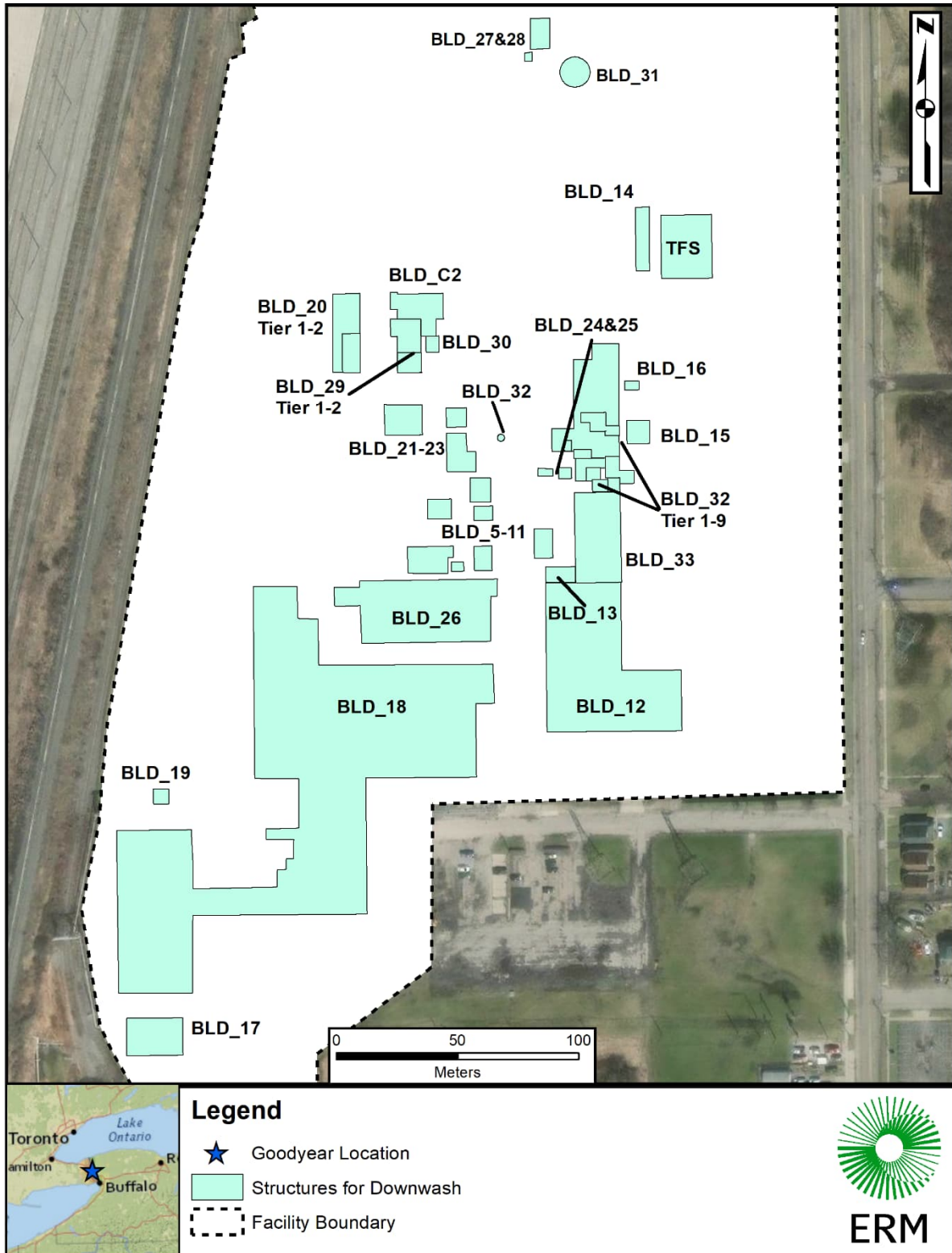
Section 3.1 provides a general overview of the Facility location, boundaries, and surrounding area. The information provided in Section 3.1 is directly relevant to the air dispersion modeling analysis.

The Facility is located at 5500 Goodyear Drive in the City of Niagara Falls, Niagara County, New York. The approximate Universal Transverse Mercator (UTM) coordinates for the facility are 662694.44 meters Easting by 4772372.33 meters Northing (NAD 1983, Zone 17). Figure 5-1 provides a general area map showing the location of the facility and surrounding area, while Figures 5-2 and 5-3 show the buildings within the property boundary as well as the location of the emission points that require Part 212 air dispersion modeling, respectively. Table A-2 in Appendix A lists the structures included in the downwash analysis, which corresponds to the model IDs in Figure 5-2. Maximum length and width are estimated for most structures because they were drawn as polygons and that information is not provided in the Building Profile Input Program (BPIP). A continuous fence and gate will restrict public access to the Facility. Consistent with modeling guidance, impact receptors will be removed from within the Facility's fence line.

Figure 5-1: Location of the Goodyear Facility

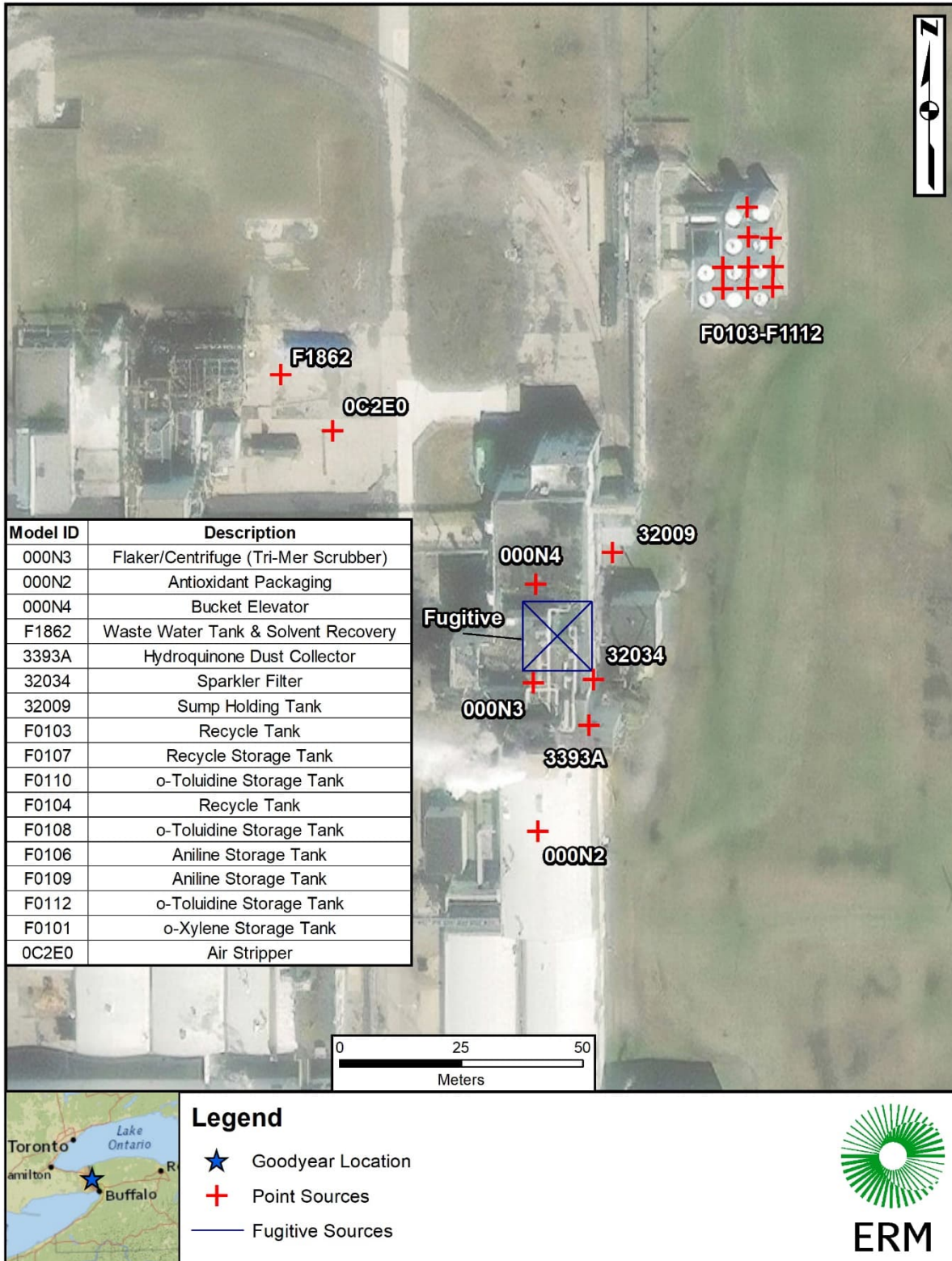


Figure 5-2: Structures at the Goodyear Niagara Falls Facility



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Figure 5-3: Sources at the Goodyear Niagara Falls Facility



In various recycle tanks, unreacted raw material from the product manufacturing process is recovered and recycled back into the manufacturing process. The recycle material composition varies based on the variability of recovered and recycled unreacted raw materials from the batch manufacturing process, but recent recycled raw material composition testing conducted at the Facility provides the average weight percentages of the following raw materials:

- 33.09% O-xylene
- 13.28% Aniline
- 13.12% Phenol
- 22.49% O-Toluidine
- 0.61% Hydroquinone
- 2.93% Nailax

### 5.3 1.88% WATER EMISSION SOURCE CHARACTERIZATION

The Goodyear Manufacturing facility has 16 emission points that require Part 212 air dispersion modeling. All emission points will be modeled as point sources that exhaust vertically; some sources have rain caps or other obstructions to vertical flow. Table 5-2 provides the source characteristics that will be input into the dispersion model. Fugitive emissions will also be addressed in the final modeling submittal, as described in Section 4.2. The approximate location of the fugitive source is indicated in Figure 5-3, with a release height of approximately 14 meters. It will be modeled as a volume source centered at this height; this represents fugitives escaping the top of the main structure in the vicinity of other process sources.

Table 5-2: Point Source Characteristics

Emission Point ID	UTMx (m)	UTMy (m)	Base Elevation (m)	Stack Height (m)	Exit Temp (K)	Exit Velocity (m/s)	Stack Diameter (m)	Capped?
000N2	662675.52	4772301.27	173.64	10.36	297.04	8.62	0.46	Yes
000N3	662674.65	4772331.75	173.64	24.38	306.89	7.88	0.65	No
000N4	662675.11	4772351.95	173.64	18.59	310.78	5.83	0.30	No
32009	662690.91	4772358.44	173.64	15.54	294.26	0.58	0.10	No
32034	662686.96	4772332.42	173.64	16.76	300.93	8.18	0.81	Yes
3393A	662686.04	4772322.99	173.64	17.07	295.37	10.20	0.56	Yes
0C2E0	662633.42	4772383.48	173.64	3.35	294.26	1.17	0.10	No
F0101	662718.59	4772429.54	173.64	8.84	294.00	0.23	0.05	Yes

Emission Point ID	UTMx (m)	UTMy (m)	Base Elevation (m)	Stack Height (m)	Exit Temp (K)	Exit Velocity (m/s)	Stack Diameter (m)	Capped?
F0103	662723.84	4772413.10	173.64	8.84	294.26	0.23	0.05	Yes
F0104	662723.86	4772417.30	173.64	8.84	294.26	0.23	0.05	Yes
F0106	662723.50	4772423.16	173.64	1.22	294.26	0.23	0.05	Yes
F0107	662718.62	4772412.80	173.64	8.84	294.26	0.23	0.05	No
F0108	662718.78	4772417.21	173.64	8.84	294.26	0.23	0.05	Yes
F0109	662713.61	4772417.12	173.64	1.22	294.26	0.23	0.05	Yes
F0110	662713.61	4772412.71	173.64	8.84	294.26	0.23	0.05	Yes
F0112	662718.82	4772423.38	173.64	8.84	294.26	0.23	0.05	Yes
F1862	662622.73	4772395.16	173.64	3.35	294.26	1.17	0.10	No

Appendix A provides a summary of the emission rates that will be used in the air modeling exercise. Values were calculated using the maximum annual emission rate (pounds per year) and maximum hourly emission rate (pounds per hour). Where more than one emission source is exhausted via a common emission point, the emission rate represents the total mass flow from all sources ducted to the emission point.

## 5.4 MODELING METHODOLOGY

### 5.4.1 MODEL SELECTION AND APPLICATION

The latest version of USEPA's AERMOD model (version 24142) will be used to predict the ambient impacts for each modeled air contaminant. Regulatory default options will be used in the analysis.

### 5.4.2 GEOGRAPHIC SETTING – TERRAIN AND LAND USE CHARACTERISTICS

The terrain around the facility and within the modeling domain is generally flat with a slight downward slope towards the south. The Niagara River (located approximately 1.4 kilometers south of the facility) runs through the modeling domain.

The land use surrounding the facility can be generally described as developed land, or more specifically high/medium/low intensity developed land use. Although the area is generally high to medium intensity developed land, the relative percentage of this land use category did not meet the criteria to be classified as "urban" that is described in Section 7.2.1.1(b)(i) of 40 CFR 51 Appendix W (The Guideline on Air Quality Models). The urbanized land use categories (Medium and Urban Development) accounted for about 29.26% of the total land use within three

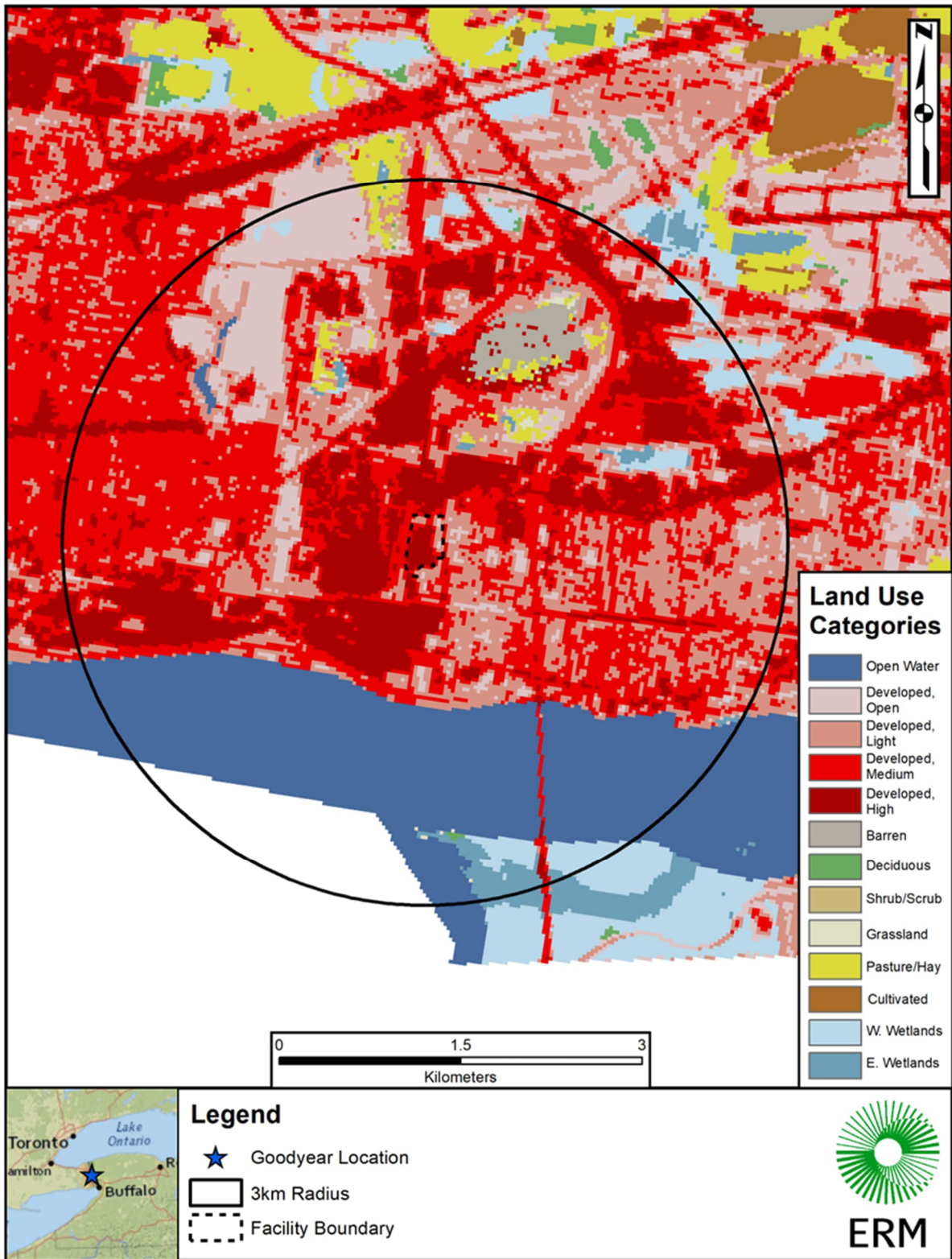
kilometers of the proposed location. Low intensity developed land accounted for about 24% of the total land use area.

Table 5-4 tabulates the results of the National Land Cover Dataset (2016) within 3 kilometers of Goodyear Facility depicted in Figure 5-4. Some of this radius includes uncategorized land use across the international border under Grid Code 0.

Table 5-3: Land Use Analysis Around 3-km of the Goodyear Facility

Grid Code	Grid Code Description	pixel count	Area (km <sup>2</sup> )	Area (%)
0	Missing/Out-of-Bounds:	1,301	1.17	4.14%
11	Open Water:	5,787	5.21	18.42%
21	Developed, Open Space:	3,506	3.16	11.16%
22	Developed, Low Intensity:	7,827	7.05	24.92%
23	Developed, Medium Intensity:	5,104	4.59	16.25%
24	Developed, High Intensity:	4,085	3.68	13.01%
31	Barren Land (Rock/Sand/Clay):	830	0.75	2.64%
41	Deciduous Forest:	195	0.18	0.62%
43	Mixed Forest:	10	0.01	0.03%
52	Shrub/Scrub:	395	0.36	1.26%
71	Grasslands/Herbaceous:	169	0.15	0.54%
81	Pasture/Hay:	578	0.52	1.84%
82	Cultivated Crops:	501	0.45	1.60%
90	Woody Wetlands:	797	0.72	2.54%
95	Emergent Herbaceous Wetland:	325	0.29	1.03%
TOTAL		31,410	28.27	100.00%
URBAN AREA		9,189	8.27	29.26%

Figure 5-4: Land Use Categorizations Around the Goodyear Facility



### 5.4.3 METEOROLOGICAL DATA

Guidance for air quality modeling recommends the use of one year of onsite meteorological data or five years of representative off-site meteorological data. Since onsite data are not available for the Facility, meteorological data available from the National Weather Service (NWS) will be used in this analysis.

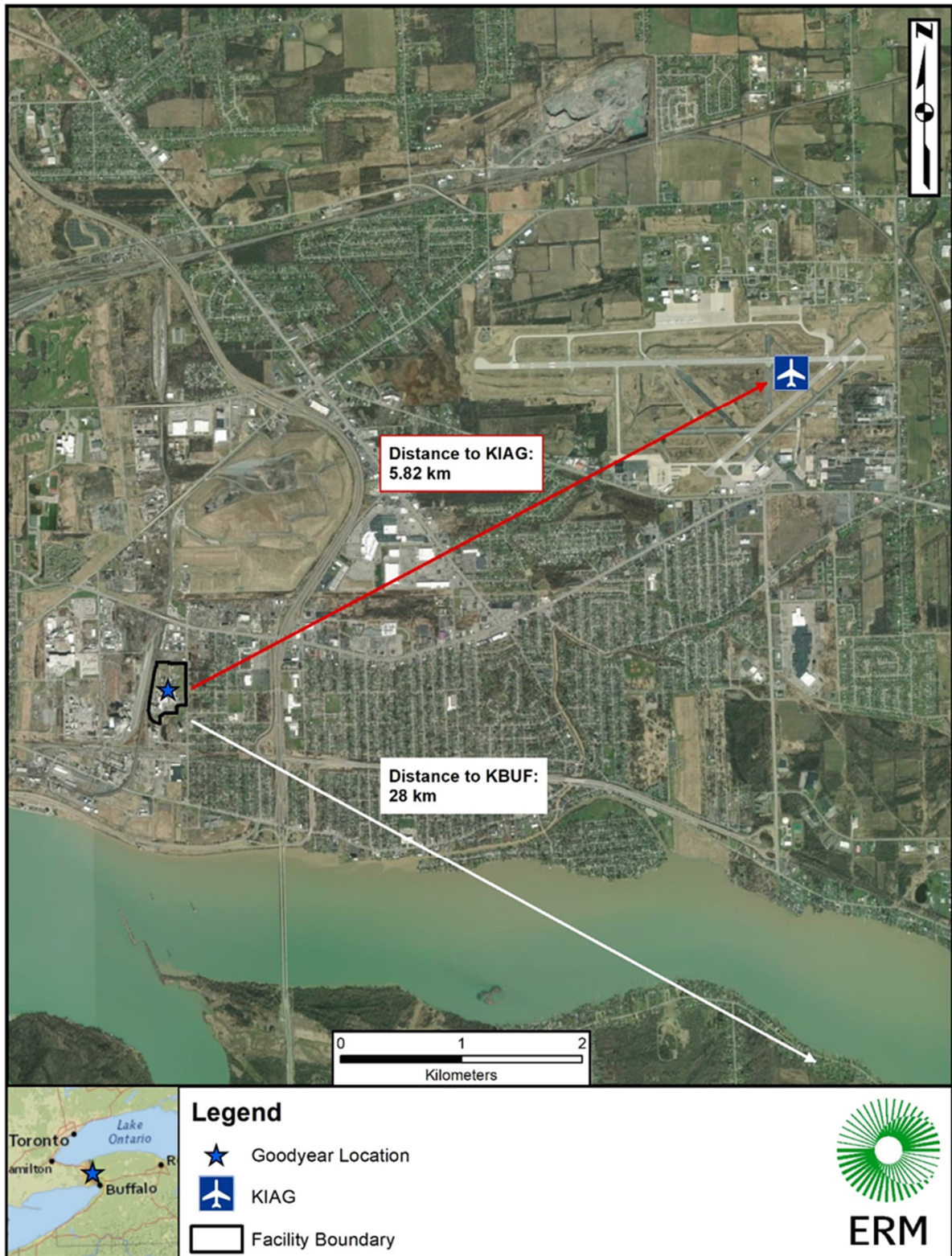
NYSDEC has provided five recent years (2020-2024) of AERMOD-ready pre-processed meteorological data (AERMET v. 24142) using surface observations from Niagara Falls International Airport (KIAG) and upper air data from Buffalo, NY. The relative locations of the Facility and the Niagara Falls International Airport are shown in Figure 5-5. Table 5-5 summarizes the data characteristics of the surface observation site. The 5-year wind rose for the Niagara Falls International Airport is provided in Figure 5-6. The predominant wind direction at this airport is from the southwest (with secondary flow from the east).

Table 5-4: Characteristics of Meteorological Data from the Niagara Falls International Airport

Parameter	Value
Distance from Goodyear	5.82 km
Average Wind Speed	4.54 m/s
Percent Calm Hours	0.68%
Data Completeness	99.61%

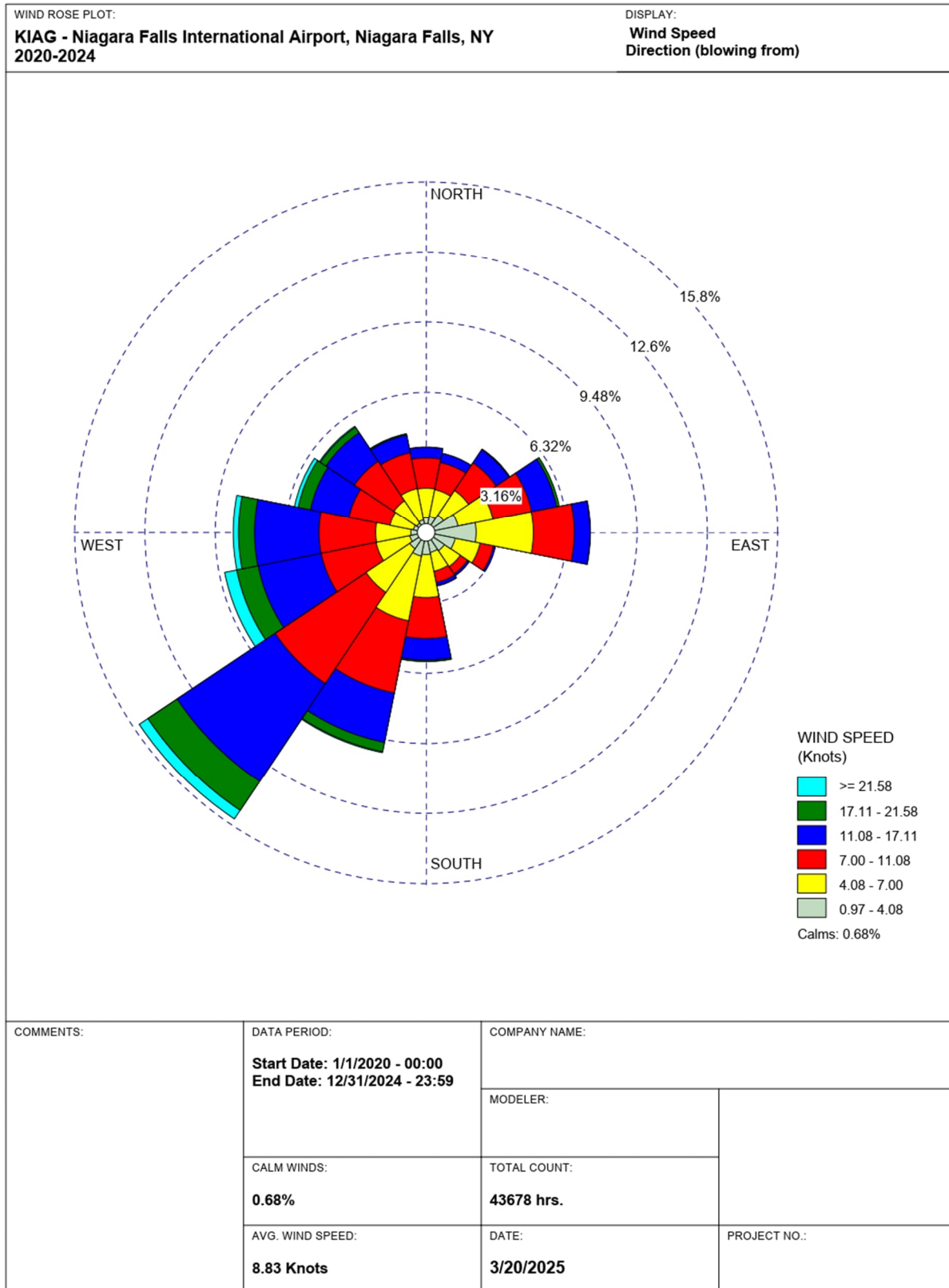
Due to its close proximity to Goodyear, the meteorological data available from Niagara Falls International Airport is suitably representative of conditions at the Facility. ERM proposes to use the five years of processed meteorological data from this airport for the modeling analysis.

Figure 5-5: Location of Goodyear in Relation to Niagara Falls International Airport



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Figure 5-6: 5-year Wind Rose (2020-2024) for Niagara Falls International Airport



#### 5.4.4 RECEPTOR GRID

A comprehensive Cartesian receptor grid extending out to approximately 10 kilometers (km) from the center of the proposed facility will be used in the AERMOD modeling analysis to assess the maximum ground-level concentration of each air contaminant. While it is expected that the 10-km receptor grid will be more than sufficient to resolve the maximum impacts and any potential significant impact area(s), should modeled impacts be found to not be clearly decreasing at the edge of the grid, the review area will be expanded as needed to capture the maximum impacts.

The Cartesian receptor grid will consist of the following receptor spacing, per NYSDEC Modeling Guidance:

- 20-meter spacing along the facility fenceline;
- 70- meter spacing extending from the fenceline to 1 km;
- 100-meter spacing extending from 1 km to 2 km;
- 250-meter spacing extending from 2 km to 5 km; and
- 500-meter spacing extending from 5 km to 10 km.

Figures 5-7 and 5-8 show the near field and far field Cartesian receptor grid, respectively. Receptors were removed in areas across the international border. In addition to the receptor grid, 14 sensitive receptors were identified representing five categories (hospitals, daycare centers, nursing homes, schools, and residences). These sensitive receptors were selected based on proximity to the facility and are located spatially around the property. Table 5-6 provides a summary of these sensitive receptors, while Figure 5-9 shows the location of the sensitive receptors relative to the location of Goodyear. All sensitive receptor addresses are in the City of Niagara Falls, and Figure 5-9 labels receptors by their Receptor No. in Table 5-6.

Terrain elevations from National Elevation Data (NED) from USGS were processed using the most recent version of AERMAP (v.24142) to develop the receptor terrain elevations required by AERMOD. Per DAR-10 Guidance, 1/3 arc second (10m) data was used for assigning these elevations.

Table 5-5: Identification of Sensitive Receptors

Receptor No.	Type	Name	Address	Approximate Distance from Goodyear (km)
1	Hospital	Niagara Falls Medical Center	621 10th St	4.01
2	Daycare	Safari Kids Club Daycare	2745 Niagara St	2.07
3	Daycare	LaSalle Early Childhood Center	8477 Buffalo Ave	3.20
4	Daycare	First Step Child Care Center	2113 Military Rd	2.53
5	Nursing Home	Niagara Rehabilitation-Nursing	822 Cedar Ave	4.28
6	School	Cataract Elementary School	6431 Girard Ave	1.02
7	School	Bloneva Elementary School	2513 Niagara St	2.39
8	School	Gaskill Preparatory School	910 Hyde Park Blvd	2.36
9	School	LaSalle Preparatory School	7436 Buffalo Ave	2.32
10	Residence	Nearby Residence	547 56th St	0.22
11	Residence	Nearby Residence	512 56th St	0.28
12	Residence	Nearby Residence	5631 Girard Ave	0.26
13	Residence	Nearby Residence	5629 Charles Ave	0.31
14	Business	Fred's Your Auto Body Repair	530 56th St	0.26

Figure 5-7: Near-Field Receptor Grid

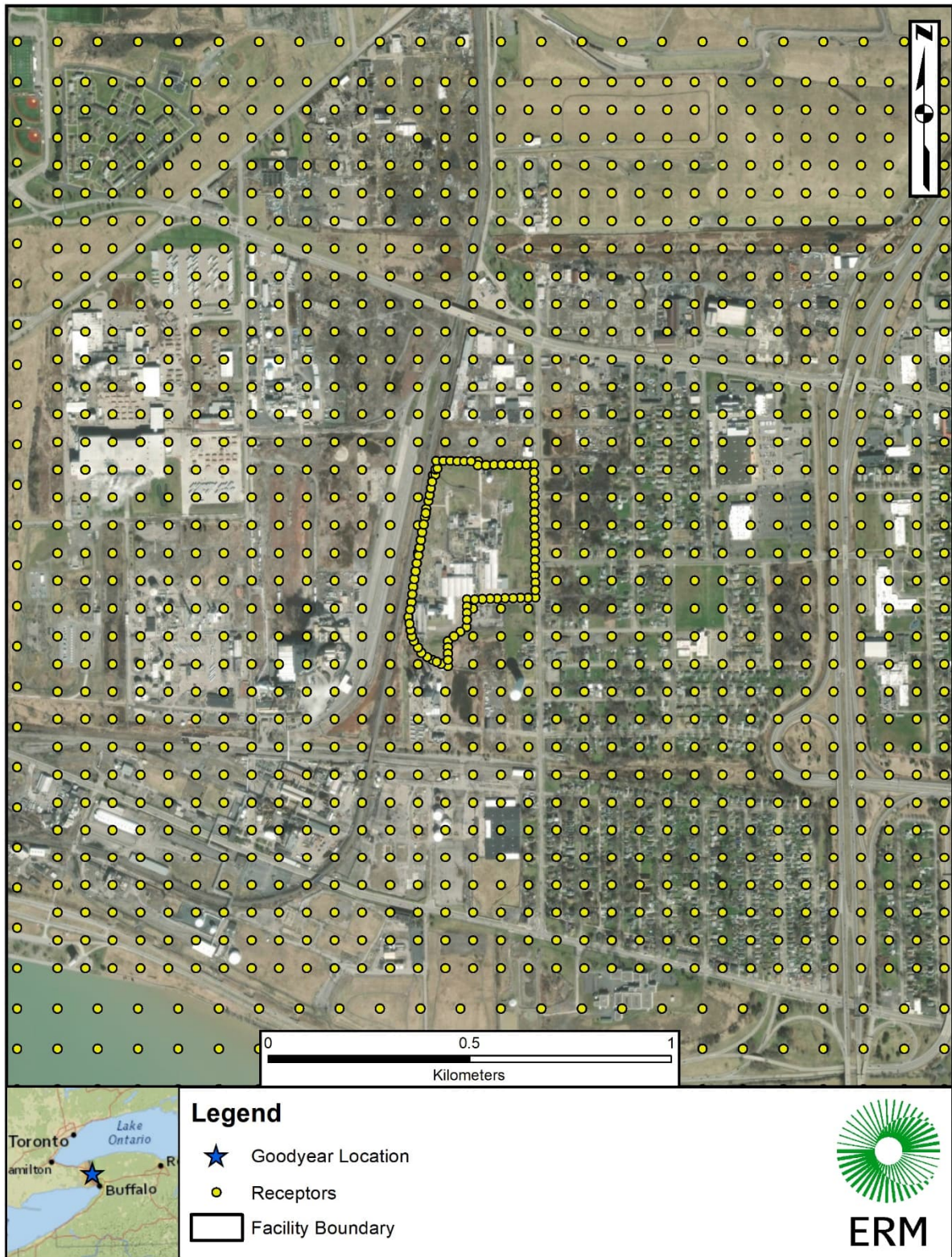


Figure 5-8: Far-Field Receptor Grid

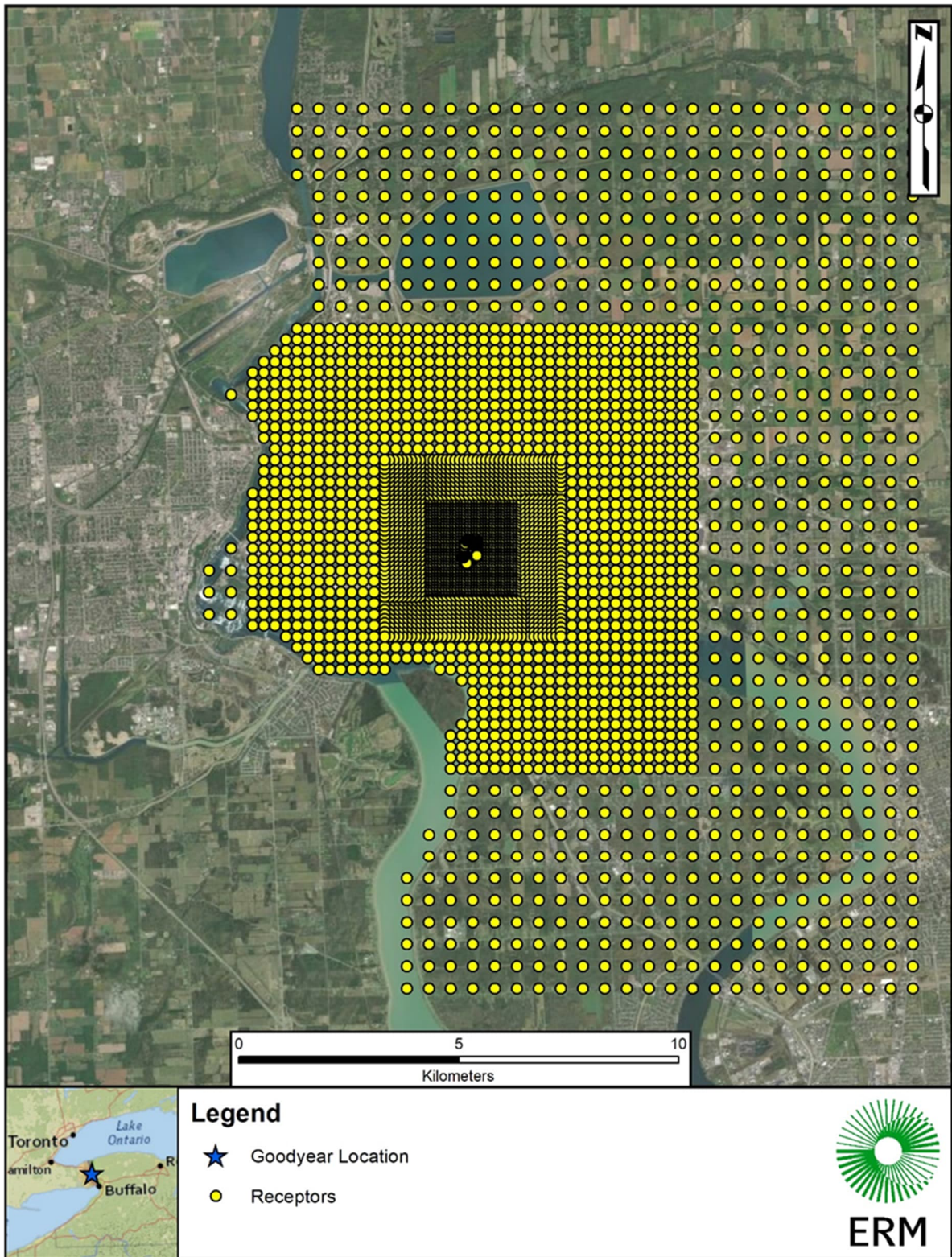
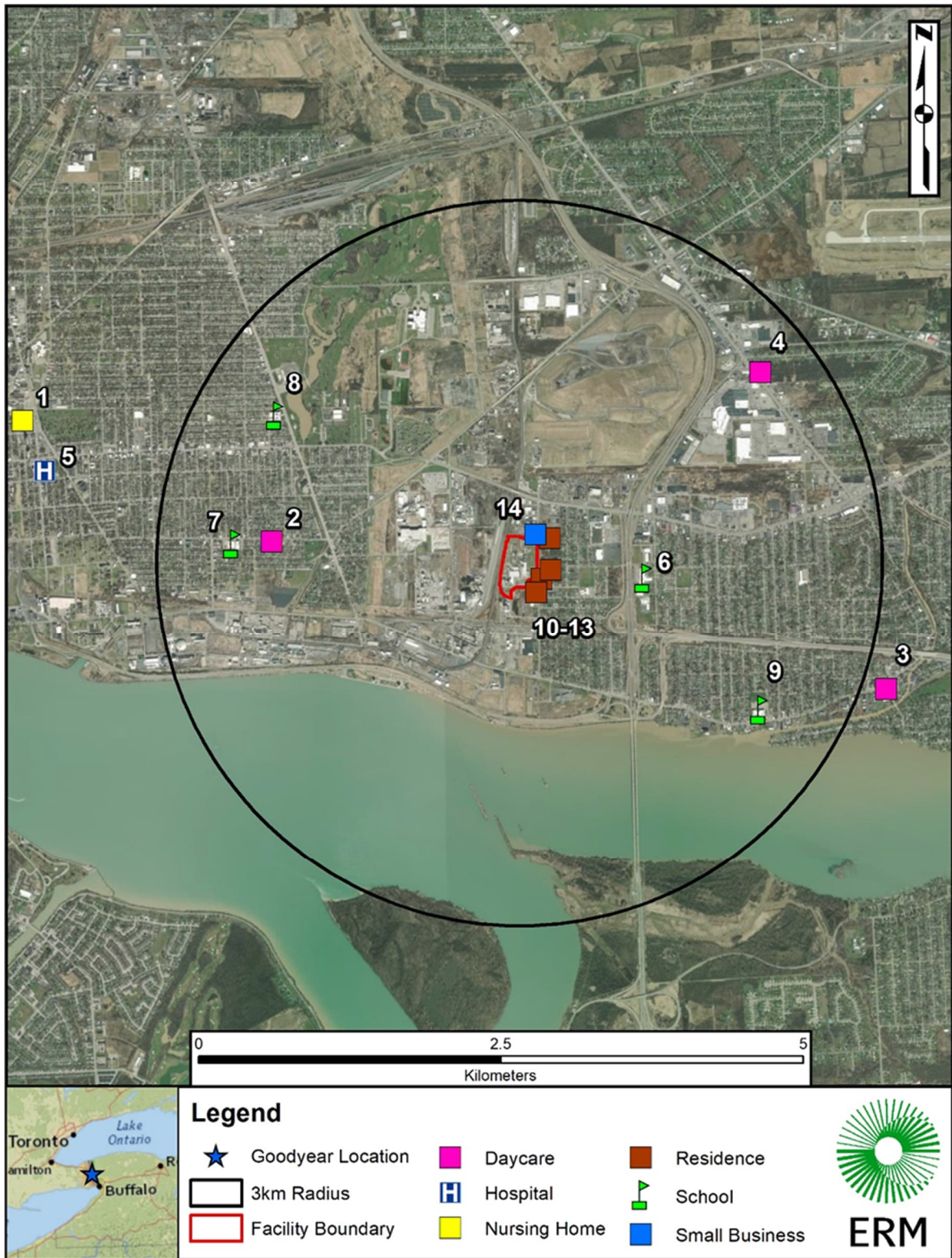


Figure 5-9: Location of Sensitive Receptors



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### 5.4.5 GOOD ENGINEERING PRACTICE (GEP) STACK HEIGHT ANALYSIS

Per 40 CFR 51, stack heights in excess of the Good Engineering Practice (GEP) stack height may not be used to establish emissions limitations. GEP is defined as the greater of 65 m or the formula height, defined by the following:

$$H_{GEP} = H_b + 1.5 L$$

where,

$H_{GEP}$  = formula GEP stack height

$H_b$  = height of nearby building

L = lesser of the height and maximum projected width of adjacent or nearby building

The Building Profile Input Program (BPIP), version 04274, will be used to make the determination on what building(s) affect(s) each modeled point source and the appropriate dimensions of the building to use for each source in the modeling analysis, as well as calculate the formula GEP height for each modeled source.

To determine whether aerodynamic building downwash from any building could affect a stack, the radius of influence from the building will be determined. For purposes of downwash in regulatory dispersion modeling, the radius of influence of a building is a distance referred to as "5L", that is, five times the height or maximum projected width (whichever is less) of the building itself. Any point source located within the 5L distance from a building would potentially be subject to downwash. BPIP was used to make the determination on what building(s) affect a modeled point source and the appropriate dimensions of the building to use in AERMOD's downwash algorithms. Figure 5-2 shows the structure heights and relative location to the sources.

### 5.4.6 PRESENTATION OF MODELING RESULTS

Ground level modeled concentrations will be identified for the appropriate averaging periods for evaluation against the applicable Annual Guideline Concentration (AGC) and Short-term Guideline (SGC) values identified in the AGC/SGC tables of NYSDEC's Policy DAR-1 ("Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212", revised 12 February 2021).

Modeling results will be presented in a tabular format. A modeling archive will be provided to the NYSDEC with the final report.

## 6. REFERENCES

- New York State Department of Environmental Conservation, "DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212", 12 February 2021.
- New York State Department of Environmental Conservation, "DAR -10: NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis", 1 September 2020.
- U.S. Environmental Protection Agency, AERMOD Implementation Guide (EPA-454/b-241-0006) November 2024.
- U.S. Environmental Protection Agency, Guideline on Air Quality Models (GAQM, 40 CFR Appendix W), 17 January 2017.

APPENDIX A – PART 212 SOURCE EMISSIONS AND STRUCTURES FOR DOWNWASH

Table A-1: Summary of Emission Rates used in Modeling Analysis

EP ID	Aniline (CAS 00062-53-3)		Ortho-toluidine (CAS 00095-53-4)		Phenol (CAS 00108-95-2)		Ortho-xylene (CAS 00095-47-6)		Diphenylamine (CAS 00122-39-4)	
	MAX ANNUAL (lbs/yr)	HOURLY (lbs/hr)	MAX ANNUAL (lbs/yr)	HOURLY (lbs/hr)	MAX ANNUAL (lbs/yr)	HOURLY (lbs/hr)	MAX ANNUAL (lbs/yr)	HOURLY (lbs/hr)	MAX ANNUAL (lbs/yr)	HOURLY (lbs/hr)
FUG	4.38E+00	5.00E-04	1.93E+01	2.20E-03	1.75E+00	2.00E-04	7.08E+01	8.08E-03	0.00E+00	0.00E+00
000N2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
000N3	9.39E+01	1.07E-02	4.78E+01	1.02E-02	2.00E+01	2.28E-03	2.04E+03	2.33E-01	5.62E+01	6.41E-03
000N4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E+00	3.10E-04
32009	4.38E-01	5.00E-05	1.75E-01	2.00E-05	3.50E-01	4.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32034	1.55E+02	1.77E-02	6.33E+00	5.32E-02	7.76E+01	8.86E-03	3.10E+01	3.54E-03	6.21E+01	7.09E-03
3393A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OC2E0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.38E+03	5.00E-01	0.00E+00	0.00E+00
F0101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E+04	1.62E+00	0.00E+00	0.00E+00
F0103	3.50E-01	4.00E-05	1.75E-01	2.00E-05	1.75E-01	2.00E-05	1.05E+01	1.20E-03	0.00E+00	0.00E+00
F0104	3.50E-01	4.00E-05	1.75E-01	2.00E-05	1.75E-01	2.00E-05	1.05E+01	1.20E-03	0.00E+00	0.00E+00
F0106	1.33E-01	6.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F0107	3.50E-01	4.00E-05	1.75E-01	2.00E-05	1.75E-01	2.00E-05	1.05E+01	1.20E-03	0.00E+00	0.00E+00
F0108	0.00E+00	0.00E+00	1.06E+00	2.84E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F0109	1.33E-01	6.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F0110	0.00E+00	0.00E+00	1.06E+00	2.84E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F0112	0.00E+00	0.00E+00	7.29E-01	1.95E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F1862	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E+03	2.10E-01	0.00E+00	0.00E+00



Table A-2: Summary of Structures Included in Downwash Analysis

Building ID	Tier Number	Tier Height (m)	Maximum X-Length (m)	Maximum Y-Length (m)	Diameter (m)
BLD_5	1	3	10	7.6	--
BLD_6	1	3	8	9.1	--
BLD_7	1	3	8.2	5.5	--
BLD_8	1	3	7.5	11.7	--
BLD_9	1	3	19	10.7	--
BLD_10	1	3	5.5	3.7	--
BLD_11	1	3	7.7	9.5	--
BLD_12	1	6	55.5	61.5	--
BLD_13	1	3	12.2	6.6	--
BLD_14	1	3	5.9	26	--
BLD_15	1	3	9.4	9.4	--
BLD_16	1	3	5.9	3.6	--
BLD_17	1	3	23	15.3	--
BLD_18	1	6	103	103	--
BLD_19	1	3	6.3	6.3	--
BLD_20	1	3	11.2	32.2	--
	2	6	7.2	15.8	--
BLD_21	1	3	15.6	12.3	--
BLD_22	1	3	8.4	8	--
BLD_23	1	3	12	15.8	--
BLD_24	1	3	6.1	3.2	--
BLD_25	1	3	5.3	4.3	--
BLD_26	1	6	67.4	25.6	--
BLD_27	1	3	8	12.7	--
BLD_28	1	3	3	3.7	--
BLD_29	1	3	12.5	21.8	--
	2	6	10	8	--
BLD_30	1	3	5	6.6	--

Building ID	Tier Number	Tier Height (m)	Maximum X-Length (m)	Maximum Y-Length (m)	Diameter (m)
BLD_31	1	8.84	--	--	12.44
BLD_32	1	3	5.9	5.5	--
	2	11.02	5	5.6	--
	3	14.02	12.3	9.1	--
	4	14.02	47.4	27.8	--
	5	17.02	12	7.5	--
	6	17.02	7.3	3.6	--
	7	17.02	3	4.4	--
	8	17.02	11.7	8.4	--
	9	18.52	6.3	5.1	--
BLD_33	1	10.36	19	37.3	--
BLD_34	1	8.84	--	--	2.94
BLD_C2	1	10.67	21.8	17.4	--
TFS	1	8.23	21	26	--



APPENDIX B GOODYEAR RESPONSES TO DEC COMMENTS  
AUGUST 2025 RFAI ON THE AERMOD  
PROTOCOL AND PART 212 ANALYSIS



Responses to Comments on the Air Quality Modeling Protocol, dated August 1, 2025

*NYSDEC Comment No. 1: Protocol Table 5-1 must be updated to list every Part 212 contaminant emitted at the facility, each contaminant's facility-wide emission rate (in lbs/yr) and mass emission limit (MEL), as well as their Annual Guideline Concentrations (AGCs), Short-Term Guideline Concentrations (SGCs), and whether an air contaminant is an HTAC. This table should clearly identify which contaminants exceed their MEL levels and would therefore need to be modeled. For any Part 212 contaminants emitted at the facility but not listed in Part 212-2.2 Table 2 or DAR-1 AGC/SGC tables, the applicant should seek guidance from NYSDEC Air Toxics section by emailing DAR.AirToxics@dec.ny.gov..*

Goodyear Response: Table 5-1 has been updated to identify HTACs, facility-wide emission rates, MELs, AGCs, and SGCs. The Revised AERMOD Protocol can be found in Appendix D.

*NYSDEC Comment No. 2: Section 1: Please include the Facility's DEC ID in the revised modeling submission.*

Goodyear Response: The DEC ID# 9-2911-00036 has been added to the revised Protocol.

*NYSDEC Comment No. 3: Section 3.2 states there are "several tanks" at the property used to store raw materials and recycled material [...]". Please specify the exact number of tanks used and how many are to be included in modeling.*

Goodyear Response: There are a total of nine tanks used at the Facility to store raw material and recycled material. All nine tanks are included in the Revised AERMOD Protocol and properly identified on the Figures contained within the Revised AERMOD Protocol.

*NYSDEC Comment No. 4: The applicant states in sections 3.2 and 4.1 that they manufacture an "antioxidant product." If the "antioxidant product" and/or any of its ingredients are emitted by process operations, please include them in the Part 212 Evaluation described in comment 1)*

Goodyear Response: The antioxidant product, known as Nailax or Polystay 100®, is emitted as particulate matter from the Facility. The AERMOD Protocol has been updated to reflect these emissions and incorporated into the Part 212 evaluation contained within the Revised AERMOD Protocol.

*NYSDEC Comment No. 5: Section 4.1: The last sentence indicates that the ortho-toluidine (CAS# 95-53-4) fugitive emissions provided in this protocol are not final. Note that any changes in the fugitive emissions in the updated modeling protocol or report/modeling will have to be clearly explained and highlighted.*



Goodyear Response: As discussed in Goodyear's response to NOIA Comment No. 10 above, Goodyear retained a third-party contractor to conduct a fugitive emissions measurement program for facility-wide equipment components in light liquid and heavy liquid service. The results of that program have been used to update the fugitive emissions calculations for other air contaminants, including o-xylene, aniline, and DPA. ERM's May 5, 2025 technical memorandum that was submitted to the Department has been replaced with a revised memorandum, dated August 29, 2025, that is included in Appendix C. The updated fugitive emissions calculations have also been included in the updated AERMOD Air Dispersion Modeling Protocol found in Appendix D.

*NYSDEC Comment No. 6: The last paragraph of Section 4.1 states that facility-wide ortho-toluidine (OT) emissions, including the fugitives, were estimated to be 171 lbs/yr. Per Table 5-3, OT emissions add up to ~171 lbs/yr without the fugitives. According to this table, source F0112 adds another 6.062 lbs/yr. Please make sure the emission amounts are consistent throughout the protocol.*

Goodyear Response: Appendix C includes the revised facility-wide air emissions calculations including Fugitive Emissions. With the revised application package, air emission amounts have been revised for consistency across the application documents.

*NYSDEC Comment No. 7: Sections 4.1 and 5.0: There is a discrepancy between these sections and Table 5-1. Specifically, these sections do not mention diphenylamine (CAS# 122-39-4) or xylidine (CAS# 1300-73-8), both of which are in Table 5-1. Neither diphenylamine nor xylidine are HTACs. Therefore, these chemicals will need to be modeled if their facility-wide annual emission rate exceeds 100 lbs/yr.*

Goodyear Response: Diphenylamine (DPA) has been added to the relevant sections. Xylidine has been eliminated from use at the Facility since 2022, when the Facility ceased production of Polystay® 200 and AZ. For this reason, xylidine was removed from the Revised AERMOD Protocol. The Revised AERMOD Protocol is set forth in Appendix D.

*NYSDEC Comment No. 8: Section 5.1 and 5.4.3 should be updated to affirm the latest five years of surface KIAG and upper-air KBUF data, which is 2020-2024, will be used. The AERMOD-ready meteorological data is available from the NYSDEC by request to DAR.Meteorology@dec.ny.gov.*

Goodyear Response: The Revised AERMOD Protocol has been updated with the latest meteorology data provided by NYSDEC.

*NYSDEC Comment No. 9: Section 5.2: Figures 5-1 and 5-2 show the parking lot as being within the facility boundary. However, the parking lot on the southeast edge of the property is not included within the facility's fenced-in area. Receptors will need to be placed within the parking lot.*



Goodyear Response: The figures included in Section 5.2 of the Revised AERMOD Protocol have been updated to exclude the southeast parking lot from the fenced-in area of the Niagara Falls Facility, and the receptor grid has been updated to include the southeast parking lot area.

*NYSDEC Comment No. 10: In Table 5-2, please include the base elevations for each of the stacks.*

Goodyear Response: The base elevations have been added to Table 5-2.

*NYSDEC Comment No. 11: Please label the facility structures shown in the map included as Figure 5-2 by their names to be used in modeling. Additionally, provide a table with the dimensions (maximum length, width, height, tiers as needed) of all buildings within the facility boundary.*

Goodyear Response: Figure 5-2 has been updated accordingly. Table A-2 has been added with the building inputs used by BPIP. Maximum length and width are estimated because most structures were not drawn as rectangular tiers.

*NYSDEC Comment No. 12: Figure 5-3: In the "Description" column, please specify what is being recycled in emission points F0103 and F0104 and state the composition of the recycled material stored in emission point F0107.*

Goodyear Response: There is not sufficient room to add this information to Figure 5-3, but unreacted raw material from the product manufacturing process is recovered and recycled back into the manufacturing process. The recycle material composition varies based on the variability of recovered and recycled unreacted raw materials from the batch manufacturing process, but recent recycled raw material composition testing conducted at the Facility provides the average weight percentages of the following raw materials:

- 33.09% O-Xylene
- 13.28% Aniline
- 13.12% Phenol
- 22.49% O-Toluidine
- 0.61% Hydroquinone
- 2.93% Nailax
- 1.88% Water

*NYSDEC Comment No. 13: Figure 5-3: Seven emission points are shown in the storage tank cluster on the northeast side of the facility, but ten storage tanks are shown in the aerial image on which the points are superimposed. Please clarify what the remaining three tanks are used for and if they do/do not need to be modeled.*

Goodyear Response: The tanks in the storage tank cluster include nine permitted tanks and one tank with no emissions. The tanks are as follows:

- Two aniline storage tanks (F-1009 and F-1106)
- Three recycle storage tanks (F-1103, F-1104, and F0107)



- Three ortho-toluidine storage tanks (F-1108, F-1110, and F-1112)
- One o-xylene storage tank (F-1101)
- One ferric chloride storage tank. Note that this tank is not equipped with a conservation vent and the tank is considered a non-emitting storage tank based on the vapor pressure of the stored material.

The figure has been updated accordingly and the Revised AERMOD Protocol can be found in Appendix D.

*NYSDEC Comment No. 14: Section 5.3: It is not clear what type of source option will be used for modeling of the fugitive ortho-toluidine. Will this be an area source with a release height of 14 meters, or a volume source? Please provide an explanation of how fugitive ortho-toluidine emissions will be modeled.*

Goodyear Response: The fugitive emissions from the equipment component measurement (LDAR) study for o-toluidine, aniline, DPA, and o-xylene will be modeled as a volume source at approximately the building roof height.

*NYSDEC Comment No. 15: Table 5-2: Emission point F0112 (ortho-toluidine tank) is included in Table 5-3 but is not included in Table 5-2. Please update Table 5-2 to include emission point F0112.*

Goodyear Response: Table 5-2 has been updated in the Revised AERMOD Protocol to include Emission point F0112.

*NYSDEC Comment No. 16: All Table 5-2 stack parameters and Table 5-3 emission rates used in the modeling analysis will need to be reviewed and approved by a DEC engineer prior to use in the modeling analyses.*

Goodyear Response: Goodyear recognizes and understands this requirement.

*NYSDEC Comment No. 17: Table 5-3: Please add another row showing the total facility-wide maximum annual emission rate and the facility-wide maximum hourly emission rate of each chemical. There is a discrepancy between Tables 5-1 and 5-3. Table 5-1 mentions diphenylamine (CAS# 122-39-4) and xylidine (CAS# 1300-73-8), while Table 5-3 does not. Neither diphenylamine nor xylidine are HTACs. These chemicals will only need to be modeled if their facility-wide annual emission rate exceeds 100 lbs/yr.*

Goodyear Response: Table 5-3 has been updated and moved to an Appendix to the Revised AERMOD Protocol due to its size. As mentioned in the response to Air Modeling Protocol Comment No. 7, xylidine is no longer used at the Facility and has been removed from the Protocol. Diphenylamine (DPA) has been added to Table 5-1.



*NYSDEC Comment No. 18: In Section 5.4.4., please specify the resolution of the terrain elevations from the USGS National Elevation Data (NED) used. Per DAR-10 modeling guidance, we recommend 1/3 arc second (10 m) resolution.*

Goodyear Response: The AERMOD Protocol assigned all elevations using the 1/3 arc second data (10m) resolution. This clarification has been added to the Revised AERMOD Protocol.

*NYSDEC Comment No. 19: The air stripper associated with the wastewater recovery, emission source OC2EO, is referenced in Section 3.2 of the modeling protocol, and o-xylene is to be modeled per Section 4.1. Please include emission source "OC2EO" in Table 5-2 and Table 5-3.*

Goodyear Response: Emission source OC2EO, the wastewater packed air stripper, has been added to Tables 5-2 and 5-3 of the Revised AERMOD Protocol.

\*\*\*\*\*

On behalf of Goodyear, ERM appreciates the Department's input on the air permit renewal supplemental documents. If you have any follow-up questions, please reach out to myself (XX), or XX of Goodyear (XX).

Sincerely,



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Hong Kong	South Korea
India	Spain
Indonesia	Switzerland
Ireland	Taiwan
Italy	Thailand
Japan	UAE
Kazakhstan	UK
Kenya	US
Malaysia	Vietnam
Mexico	

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ATTACHMENT B REVISED CLIMATE LEADERSHIP &  
COMMUNITY PROTECTION ACT (CLCPA)  
ANALYSIS



# Climate Leadership & Community Protection Act (CLCPA) Analysis

Air State Facility (ASF) Permit  
Modification and Renewal Application;  
DEC ID No. 9-2911-00036/00151

PREPARED FOR



The Goodyear Tire & Rubber  
Company

DATE  
27 March 2026

REFERENCE  
0771139



## DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.

DOCUMENT TITLE	Climate Leadership & Community Protection Act (CLCPA) Analysis
DOCUMENT SUBTITLE	Air State Facility (ASF) Permit Modification and Renewal Application; DEC ID No. 9-2911-00036/00151
PROJECT NUMBER	0771139
DATE	27 March 2026
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AUTHOR	David Murtha, QEP
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# Climate Leadership and Community Protection Act (CLCPA) Analysis

## Air State Facility (ASF) Permit Modification and Renewal Application

The Goodyear Tire & Rubber Company

DEC Permit ID No. 9-2911-00036/00151

ERM Project No. 0771139



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## Acronyms and ABBREVIATIONS

Acronym	Description
AGC	Annual Guideline Concentrations
ASF	Air State Facility Permit
CFR	Code of Federal Regulations
CH <sub>4</sub>	Methane
CLCPA	Climate Leadership and Community Protection Act
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide Equivalents
DAC	Disadvantaged Community
DAR-21	Division of Air Resources (21: NYSDEC Program Policy, "The Climate Leadership and Community Protection Act and Air Permit Applications", dated December 14, 2022)
DEP 24-1	Division of Environmental Permits (24-1: NYSDEC Program Policy, "Permitting and Disadvantaged Communities," dated May 8, 2024)
eGRID	Emissions & Generation Resource Integrated Database
ERM	ERM Consulting & Engineering, Inc.
GHG	Greenhouse Gas
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HTAC	High Toxicity Air Contaminant
kWh	Kilowatt-hours
lb/yr	Pounds per year
LED	Light-emitting diode
MACT	Maximum Achievable Control Technology
MT	Metric tonnes
N <sub>2</sub> O	Nitrous Oxide
NYCRR	New York Code, Rules and Regulations

### Acronyms and ABBREVIATIONS

NYSDEC	New York State Department of Environmental Conservation
O-T	ortho-Toluidine
PM	Particulate Matter
POTW	Publicly Owned Treatment Works
PTE	Potential-to-Emit
PVC	Polyvinyl Chloride
RTO	Regenerative Thermal Oxidizer
SGC	Short-term guideline concentration
tpy	Tons per year
USEPA	United States Environmental Protection Agency
VFD	Variable Frequency Drives
VOC	Volatile Organic Compounds



## 1. FACILITY OVERVIEW

The Goodyear Tire & Rubber Company owns and operates a manufacturing site located at 5500 Goodyear Drive in the City of Niagara Falls, New York (Facility). The Facility was originally built in 1946 for polyvinyl chloride (PVC) manufacturing and began production of rubber antioxidant products in 1957. Although PVC production was discontinued in 1996, the Facility continued to manufacture an antioxidant product. The Facility is located on 28 acres of land encompassing 210,000 square feet of building space that contains three reactor systems and two finishing lines.

## 2. SCOPE

As part of the Air State Facility (ASF) Permit (DEC Permit ID No. 9-2911-00036/00151) renewal and modification application (Updated July 17, 2025), the New York State Department of Environmental Conservation (NYSDEC) requires Goodyear to prepare and submit a Climate Leadership and Community Protection Act (CLCPA) analysis that includes information regarding the renewal and modification of the equipment changes and emission calculations, an AERMOD air dispersion modeling protocol, a Public Participation Plan (PPP) pursuant to CP-29, and an analysis following the procedures described in Division of Air Resources (DAR) Program Policy DAR-21 and Division of Environmental Permits (DEP) Program Policy DEP-24-1. This CLCPA analysis fulfills the requirement for Goodyear to submit a CLCPA addressing Section 7(2) and Section 7(3) as discussed in the following sections.

## 3. REGULATORY BACKGROUND

### 3.1 AIR PERMIT

The Facility has an ASF Permit, which became effective on June 15, 2009, and was modified on April 21, 2011, with no expiration date assigned by the NYSDEC. Permit conditions cap facility-wide potential emissions to less than major source thresholds through production limits. Specifically, volatile organic compounds (VOCs) are limited to less than 50 tons per year (tpy), total hazardous air pollutants (HAPs) are limited to less than 25 tpy, and o-xylene is limited to less than 10 tpy. Emissions testing correlates these limits with a production limit of 3,450 batches annually.

Goodyear is seeking to modify and renew the Facility's existing ASF Permit. In 2018, the NYSDEC DAR requested Goodyear apply to renew the ASF Permit in accordance with regulatory updates to Title 6 of the New York Code, Rules, and Regulations (6 NYCRR) Part 201 to establish 10-year term limits to ASF permits issued by the NYSDEC.

During the review of the ASF Permit renewal application, the NYSDEC requested Goodyear conduct air emissions testing of select emissions equipment and emission points (i.e., stacks). Goodyear conducted emissions testing in 2022 to fulfill NYSDEC's request. The results of the



testing programs indicated that emissions of ortho-Toluidine (O-T) and other materials emitted to the atmosphere by the Facility were predicted, through air dispersion modeling performed by the NYSDEC, to exceed their respective Annual Guideline Concentrations (AGCs) and Short-term Guideline Concentrations (SGCs) established by the NYSDEC in its Program Policy DAR-1: *Guidelines for the Evaluation and Control of Air Contaminants Under 6 NYCRR Part 212*.

On January 14, 2025, Goodyear entered into an Order on Consent (Order No. R9-20241125-128, hereafter referred to as the "Order") with the NYSDEC, requiring Goodyear to submit an Air Pollution Control Engineering Study (the "Study") to the NYSDEC within 60 days of the effective date of the Order. The Order required the Study to include the details and schedule needed for the design, procurement, installation, commissioning, and performance emissions testing of the upgraded emission sources and permanent control technology.

The Study conducted by Goodyear proposed to replace the existing Tri-Mer Whirl Wet® Scrubber with a new scrubber and incorporate a new Regenerative Thermal Oxidizer (RTO) into the air emissions control systems for the equipment that exhausts through the current scrubber and to redirect the air emissions from Elimination Tank No. 2 through the RTO as well. Once these upgraded air emissions control systems are in place, the resultant facility-wide air emissions profile from the Goodyear Facility is expected to demonstrate compliance with the regulatory requirements of New York Part 212 for Air Emissions from Process Sources.

The Order also requires Goodyear to submit to the NYSDEC, within 45 days of the Department's approval of the Study, an application including the information regarding the renewal and modification of the air permit detailing equipment changes and emission calculations, an AERMOD modeling protocol, a Public Participation Plan pursuant to CP-29, and a CLCPA analysis following the procedures described in DAR 21 and DEP 24-1.

### 3.2 CLCPA

In July 2019, Governor Andrew Cuomo signed the CLCPA, Chapter 106 of the Laws of 2019. When issuing permits, Section 7(2) of the CLCPA requires all state agencies to consider "whether such decisions are inconsistent with, or will interfere with, the attainment of the statewide greenhouse gas (GHG) emission limits established in Article 75 of the environmental conservation law." On 14 December 2022, the NYSDEC issued the final version of NYSDEC Program Policy DAR-21, which provides guidance for preparing a CLCPA analysis in support of an air permit application.

For purposes of the CLCPA, GHG emissions are calculated on a twenty-year global warming potential ("GWP20") and statewide GHG emissions including upstream out-of-state GHG emissions associated with the generation of electricity imported into the State, or the extraction, transmission, and use of fossil fuels imported into the State, and any downstream emissions attributable to the project.

Under section 7(3) of the CLCPA, the NYSDEC is required to "prioritize reductions of GHG emissions and co-pollutants in Disadvantaged Communities (DAC)" and in considering and issuing



permits, “shall not disproportionately burden disadvantaged communities”. If a facility is located in or potentially impacts a DAC, it is understood that the CLCPA analysis should provide calculations for all co-pollutants. Under § 75-0101 of the Environmental Conservation Law, “co-pollutants” are defined as “hazardous air pollutants produced by GHG emission sources”, where a “greenhouse gas emission source” is defined as “any anthropogenic source or category of anthropogenic sources of greenhouse gas emissions, determined by the department: (a) whose participation in the program will enable the department to effectively reduce greenhouse gas emissions; and (b) that are capable of being monitored for compliance.” On May 8, 2024, the NYSDEC issued the final version of NYSDEC Program Policy DEP 24-1, which outlines the analysis required for permit applications associated with facilities located in or could potentially impact a nearby DAC.

## 4. CLCPA ANALYSIS

In accordance with the NYSDEC, the following sections detail the requirements of the CLCPA analysis.

### 4.1.1 SECTION 7(2) DAR-21

Per Section 7(2) DAR-21, this analysis addresses “any new or modified emission sources that have the potential-to-emit GHG, including increases and decreases in emissions of GHG from existing equipment. In addition, the analysis includes any upstream, downstream, and indirect emissions known to be attributable to the project, including upstream out-of-state emissions from fossil fuel production, transmission, and imported electricity.”

### 4.1.2 SECTION 7(3) DEP 24-1

In accordance with CLCPA Section 7(3) DEP 24-1, this analysis also includes review of “Increases in GHG emissions or co-pollutants resulting from a project associated with any new, modified, or renewed emission sources, including those from stationary or mobile sources directly related to and essential to the proposed action, and those from existing equipment or facilities...”. The requested renewal does not involve any new sources of GHGs or co-pollutants or any increases in GHGs or co-pollutants. This CLCPA analysis has been performed for all sources of GHG emissions and co-pollutants at the Facility.

## 4.2 CLCPA EMISSION CALCULATIONS

The following sections assess the Facility’s greenhouse gas emissions as carbon dioxide equivalents (CO<sub>2</sub>e) (based on GWP20 factors included in Part 496) and its consistency with the CLCPA pursuant to CLCPA Section 7(2); and assess the Facility’s co-pollutant emissions pursuant to CLCPA Section 7(3).

Because the Goodyear Facility is located in a DAC, consistent with DEP 24-1, calculations were completed for co-pollutants (Hazardous Air Pollutants). Emissions of all co-pollutants were



calculated on a potential-to-emit (PTE) basis, past actual basis, and future projected annual emissions basis.

#### 4.2.1 GHG EMISSIONS

The Facility's GHG emissions are associated with building and process heating, propane forklifts, off-road vehicle diesel, and vehicle fleet gasoline. Per DAR-21, "the past actual emissions are defined as the highest 24-month average GHG emissions during the five years preceding the date the permit application was received unless another period is more representative". Based on this, the five-year period of calendar years 2020 – 2024 was reviewed and the baseline period was determined to be 2021-2022 with average emissions of 4,918 MT of CO<sub>2</sub>e. Table 1 shows the summary of greenhouse emissions from different fuel sources at the Niagara Falls Facility.

All calculations of CO<sub>2</sub>e are based on the 6NYCRR 496 GWP20 factors.



# ERM

TABLE 1 ACTUAL ONSITE EMISSIONS OF GHGS (2020-2024)

YEAR	Fuel	Quantity (Gas/Fuel) MMBtu/yr	Direct Onsite	Upstream	Total
			CO <sub>2</sub> e Emissions* MT/yr	CO <sub>2</sub> e Emissions* MT/yr	CO <sub>2</sub> e Emissions* MT/yr
2020	Natural Gas	40,808	2,535	1,152	3,687
	Propane	249			
	Gasoline	10			
	Diesel	14			
2021	Natural Gas	52,578	3,286	1,479	4,765
	Propane	296			
	Gasoline	10			
	Diesel	28			
2022	Natural Gas	48,794	3,051	2,019	5,070
	Propane	318			
	Gasoline	10			
	Diesel	24			
2023	Natural Gas	48,364	3,025	1,153	4,178
	Propane	294			
	Gasoline	18			
	Diesel	44			
2024	Natural Gas	44,219	2,767	1,247	4,014
	Propane	351			
	Gasoline	13			
	Diesel	14			

\*Emission calculations have been updated to reflect the factors in the 2025 Statewide GHG Emissions Report, Appendix A, NYSDEC. December 2025.



### 4.3 FACILITY POTENTIAL TO EMIT GREENHOUSE GAS EMISSIONS

Per the requirements of DAR-21 emissions of GHGs were calculated on a PTE basis, including upstream and direct emissions. The PTE calculations include the estimated maximum natural gas usage for a new RTO that will be installed in early 2026; 2,828 MT of the total CO<sub>2</sub>e PTE are from the RTO. Table 2 provides the summary of calculated PTE GHGs. Detailed calculations of GHG PTE are provided in Appendix B-1.

TABLE 2 PTE OF GHG EMISSIONS

Fuel Type	Potential to Emit GHGs, without RTO (MT of CO <sub>2</sub> e/year)	Potential to Emit GHGs, with RTO (MT of CO <sub>2</sub> e/year)
Natural Gas	6,700	9,545
Propane	60	60
Gasoline	3	3
Diesel	8	8

### 4.4 CY2030 AND CY2050 PROJECTIONS OF GHG EMISSIONS

For calendar year 2030, Goodyear expects that its GHG emissions will remain consistent with the current year GHG emissions profile (about 4,000 MT per year of CO<sub>2</sub>e emissions), with minor adjustments that will reduce the actual GHG emissions as energy reduction initiatives and projects are implemented.

For calendar year 2050, Goodyear expects that its GHG emissions will remain consistent with the calendar year 2024 GHG emissions profile (about 4,000 MT per year of CO<sub>2</sub>e emissions). The Niagara Falls facility's GHG emissions are expected to continue to be reduced as the Company implements its net-zero GHG emissions and sustainability initiatives across its global footprint, including initiatives related to operations at the Niagara Falls Facility. However, at this time it is difficult to quantify the CO<sub>2</sub>e emissions that would result from such initiatives. To avoid overstating the potential GHG emissions reductions, Goodyear's current projections for CY2050 will remain consistent with CY2024 GHG emissions calculations.

## 5. IDENTIFICATION OF ALTERNATIVES AND MITIGATION

Goodyear is committed to lowering GHG emissions and energy consumption through various mitigation and reduction projects. In 2021, Goodyear announced its climate ambition, which includes a goal to reach net-zero Scope 1, 2 and certain Scope 3 greenhouse gas emissions by



2050, as well as a commitment to achieve near-term science-based targets by 2030, including reducing Scope 1 and 2 emissions by 46 percent and certain Scope 3 emissions by 28 percent, as compared to a 2019 baseline. Goodyear publishes an Annual Corporate Responsibility Report — charting the company's progress towards its sustainability goal. This is something the company has done since 1996. The most recent Corporate Responsibility Report and more information on Goodyear's commitment to sustainability can be found at [Goodyear.com/responsibility](https://www.goodyear.com/responsibility). The initiatives described below related to the Niagara Falls Facility reinforce that commitment.

### 5.1 RECENT AND ONGOING MITIGATION EFFORTS

Goodyear implemented a re-lamping program beginning in 2019 to replace facility-wide light bulbs with light-emitting diode (LED) lamps to improve energy efficiency and lower overall carbon emissions. Re-lamping in the warehouse was completed in 2023 by replacing 4-foot fluorescent bulbs with LED lamps. Seventy-five percent (75%) of the metal halide bulbs in the production area were replaced with LED lamps and in some cases the lighting fixtures were replaced. Outside lighting is currently in the process of being replaced with LED alternatives. To date Goodyear has replaced 1,300 4-foot fluorescent light bulbs with LED lamps, 60 High Bay metal halide bulbs with LED fixtures and lamps, and 35 metal halide flood lights with LED flood lights. The re-lamping initiative is ongoing with expected completion in 2028.

Electric powered forklifts have become increasingly more energy efficient, and as powerful as propane-fueled forklifts. Currently, there are five forklifts used in the facility warehouse that are powered by propane, and 2 battery-powered forklifts. Current propane use is approximately 400, 20-pound bottles per year. However, Goodyear has implemented a program to replace older forklifts that use propane with electric forklifts whenever each forklift is permanently retired. Replacing the propane operated forklifts with battery powered forklifts will contribute to overall reduction in facility-wide GHG emissions.

Goodyear is in the process of restoring the main water basin to restore efficiency in treating water before it is sent out to the local utility. The project includes the installation of more energy efficient pumps, restoring the filter system and preparing and implementing an annual maintenance plan to optimize system performance. Additionally, the pumps will maximize the water filtration process resulting in cleaner wastewater that is discharged to the local Publicly Owned Treatment Works (POTW).

### 5.2 HISTORICAL PROJECTS THAT REDUCED GHG EMISSIONS

Leaks in compressed air systems can represent a significant source of wasted energy and create operational inefficiencies. Goodyear implemented a leak study of the facility air compressor pumps and lines in 2022. The project scope was to identify and repair potential pump and piping leaks that can contribute to energy inefficiencies. Compressor piping leaks were discovered at various locations throughout the facility. Goodyear implemented corrective actions and repaired the leaks



resulting in energy use reductions. Also, a continuous run compressor was replaced with a higher efficiency-on demand style resulting in additional increased energy efficiencies.

### 5.3 PROJECTS UNDER EVALUATION TO REDUCE GHG EMISSIONS

Goodyear is currently evaluating cooling tower improvement options to maximize efficiency while reducing energy consumption and ultimately its carbon footprint. Options being considered include implementing variable frequency drives (VFDs) for fans and pumps to minimize continuous “full power” operation, evaluating different types of storage tanks to use for the project, new type of piping, and a new storage tank. If implemented, completion of this project can be expected by 2028.

## 6. SECTION 7(3) EVALUATION

Goodyear is located within a DAC and must demonstrate that the renewal and modification of the ASF permit will not have a disproportionate impact on the DAC.

Currently, Goodyear is in the process of installing a new wet scrubber to replace the current Tri-Mer scrubber, as well as a new RTO. Both Elimination Tank #2 and the centrifuge of Emission Unit U-000N3 will be routed to the new scrubber and RTO. The new scrubber is designed to control particulate emissions by 90%, and the RTO is expected to destroy 90% of organic emissions from these sources.

In addition to the replacement of the current Tri-Mer Whirl-Wet Scrubber and installing a new add-on RTO, Goodyear installed a temporary carbon adsorption system on the exhaust gases from the Elimination Tank No. 2 that will continue to serve as an interim control measure until such time that the permanent solution (i.e., the replacement wet scrubber and RTO system) is installed and operational. This interim carbon control system, operational since April 10, 2025, is currently achieving greater than 90% control efficiency of the exhaust gases from Elimination Tank No. 2.

The installation of the interim air emissions control system and the permanent air emissions control systems will reduce the impacts and any disproportionate burden on the surrounding DAC.

This section quantifies the co-pollutants emitted at the Facility on past actual, potential-to-emit (PTE), and future bases.

### 6.1 EMISSIONS OF CO-POLLUTANTS FROM GHG SOURCES

For each stationary and mobile source type at the Facility that emits a GHG, calculations were made to determine the emissions of co-pollutants on past actual, PTE, and future bases. Appendix B includes details of the calculated PTE values for individual HAPs, for each fuel type.

The Facility currently operates natural gas burners to heat Dowtherm, a heat transfer fluid, which is used to provide efficient process heat. The Facility uses propane powered forklifts, as well as gasoline and diesel-powered motor vehicles (Note that no HAP emission factors have been



published specifically for gasoline or diesel motor vehicles. HAPs from these sources use the relevant stationary source AP-42 factors). The new RTO for control of HAPs and VOCs will be natural gas fired and is rated at a maximum heat input of 4 MMBtu/hr. Although the RTO will increase HAPs from fuel combustion, the amount of process VOC and HAP destruction is far larger (See Table 5, "Future Emissions" row). Emissions of criteria pollutants from gasoline, diesel, and propane mobile sources were determined using the "Payback On-Road Calculator" and "Payback Off-Road Calculator" in *AFLEET Online*<sup>1</sup>. The results of these Calculators are found in Appendix F-3.

**TABLE 3 CO-POLLUTANT PTE (GHG SOURCES)**

Fuel Type	Potential-to-Emit Co-Pollutant Emissions from GHG Sources					
	HAPs (lbs/year)	NOx (lbs/year)	SO <sub>2</sub> (lbs/year)	CO (lbs/year)	PM (lbs/year)	VOCs (lbs/year)
Natural Gas	217.19	11,508	69.05	9,667	874.63	632.95
Propane	0.65	130.09	0	1,124.93	20.16	14.07
Gasoline	0.07	0.04	0	1.50	0.03	0.13
Diesel	0.17	2.33	0.82	0.82	1.05	0.10

**TABLE 4 CO-POLLUTANT ACTUAL EMISSIONS (GHG SOURCES)**

Fuel Type	Actual Co-Pollutant Emissions from GHG Sources					
	HAPs (lbs/year)	NOx (lbs/year)	SO <sub>2</sub> (lbs/year)	CO (lbs/year)	PM (lbs/year)	VOC (lbs/year)
Natural Gas	90.31	4,969	30	4,174	378	273
Propane	0.59	94.6	0	908	14.6	10.9
Gasoline	0	0.04	0	1.50	0.03	0.13
Diesel	0.10	1.67	0.8	0.5800	0.24	0.08

<sup>1</sup> URL: <https://afleet.esia.anl.gov/afleet/payback-offroad-calculator>. Accessed March 2026



## 6.2 EMISSIONS OF CO-POLLUTANTS FROM NON-GHG SOURCES

Goodyear’s emissions also include HAPs from sources that do not emit GHGs. The manufacturing processes at the Facility produce emissions of aniline, hydroquinone, phenol, o-toluidine, o-xylene, and xylidine.

At present, VOC and HAP emissions from Elimination Tank No. 2 are being controlled by an interim activated carbon emissions control system. Goodyear is in the process of designing and purchasing a regenerative thermal oxidizer (RTO), that will replace the activated carbon system. Installation of the RTO is expected to be completed and commissioned by October 31, 2026 and is expected to reduce emissions of HAPs and VOCs by at least 90%. As shown in Table 5, the RTO is expected to reduce overall facility-wide HAP emissions by approximately 50%.

TABLE 5 CO-POLLUTANT EMISSIONS (PROCESS SOURCES)

Calculation Type	Co-Pollutant Emissions from Process Sources					
	HAPs (lbs/year)	NOx (lbs/year)	SO <sub>2</sub> (lbs/year)	CO (lbs/year)	PM (lbs/year)	VOC (lbs/year)
Potential to Emit	8,300	--	--	--	860	17,740
Current Actual Emissions	3,750	--	--	--	210	1,000
Future Actual Emissions	1,900	--	--	--	210	1,000



## 7. CONSISTENCY WITH CLCPA GOALS

Renewal and modification of the Air State Facility Permit for The Goodyear Tire & Rubber Company's Niagara Falls facility includes calculations and estimates of GHG, co-pollutant and other federally regulated air contaminant emissions that are subject to and will continue to be compliant with the New York State and Federal-level Clean Air Act regulations (as authorized under the USEPA-delegated authority to the NYSDEC). Through New York's Environmental Conservation Law, which is enacted under the New York State Legislature's authority to protect the public health and safety and the environment, the GHGs, co-pollutants, and other federally regulated air contaminants do not pose a disproportionate burden on the adjacent DAC and will not interfere with the CLCPA's statewide goals, or result in a disproportionate burden on the disadvantaged community.

The currently installed and operating interim air emissions control system and the planned permanent air emissions control devices, once installed and operational, will result in a significant decrease in the amount of HAPs, HTACs, and VOC emissions from the facility, further reducing the impacts from the Goodyear facility to the surrounding DAC.



## 8. REFERENCES

Code of Federal Regulations. 40 CFR Part 98 – Mandatory Greenhouse Gas Reporting: Tables C-1 and C-2.

New York State Department of Environmental Conservation. DAR-21: *The Climate Leadership and Community Protection Act and Air Permit Applications*. Christopher M. LaLone, PE.; 12/14/2022.

New York State Department of Environmental Conservation. 6 NYCRR Part 496 Statewide Greenhouse Gas Emission Limits. Albany, NY.

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2025 Statewide GHG Emissions Report, Summary Report, Appendix A, New York State Department of Environmental Conservation, Albany, NY. December 2025.

URL: <https://afleet.esia.anl.gov/afleet/payback-offroad-calculator>. Accessed March 2026



APPENDIX F-1 CLCPA GREENHOUSE GAS SOURCES  
POTENTIAL TO EMIT

APPENDIX F-2 CLCPA GREENHOUSE GAS SOURCES ACTUAL  
EMISSIONS

APPENDIX F-3 CLCPA AFLEET MOBILE SOURCE RESULTS

APPENDIX F-4 PTE OF EXCLUSIVELY RTO

EMISSION SOURCES

Source	Maximum Heat Input (MMBtu/yr)	Comments
Natural Gas		
RTD	4	Maximum Heat Input = 4,000 scfh x 1,000 Btu/scfh HHV of 1,000 Btu/scfh. Max flow of 4,000 scfh RTD has not been installed as of application submittal. The expected start of construction is in the 2nd half of 2025.
DowTherm Burner No. 1	3.1	
DowTherm Burner No. 2	3.3	
DowTherm Burner No. 3	3.0	
TOTAL	13.40	
Propane		
MAXIMUM HEAT INPUT (MMBtu/yr)	659	COMMENTS
TOTAL	659	Based on the highest propane usage of the past 5 years (occurred in 2024)
Gasoline		
MAXIMUM HEAT INPUT (MMBtu/yr)	18	COMMENTS
TOTAL	18	Based on the highest gasoline usage of the past 5 years (occurred in 2023)
Diesel		
MAXIMUM HEAT INPUT (MMBtu/yr)	82	COMMENTS
TOTAL	82	Based on the highest diesel usage of the past 5 years (occurred in 2023)

POTENTIAL TO EMIT GHGS FOR IDENTIFIED SOURCES FIRING NATURAL GAS

Source	Value	Comments
Maximum Potential Operating Hours (hrs/yr) -	8760	
Maximum Heat Input for Natural Gas (MMBtu/yr) -	13.40	
Maximum Heat Input for Natural Gas (MMBtu/yr) -	117,384	=(Maximum Heat Input Rating for Boilers, MMBtu/hr) x (Maximum Potential Operating Hours, hrs/yr)

1 PTE - "Upstream" GHG Emissions Resulting from Extraction, Production & Transmission of Natural Gas

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Upstream Emission Factor (g/MMBtu)	4.984	270	6.56	27,691	
Upstream Emission Factor (lb/MMBtu)	10.979	6,952-01	1.32-04	60,889	-(Combustion Emission Factor, g/MMBtu) x (Btu / 454 g)
Upstream Emissions (lb/yr)	1,29E+06	6,98E+04	1.6E-01	7,15E+06	-(Maximum Natural Gas Usage, MMBtu/yr) x (Upstream EF, lb/MMBtu)
Upstream Emissions (ton/yr)	644.32	34.90	0.01	3,57E+03	-(Upstream Emissions, lb/yr) x (ton/ 2000 lb)
20-yr Global Warming Potential (GWP) <sup>1</sup>	1	84	284	3,57E-38	
Upstream Emissions as CO <sub>2</sub> e (ton/yr)	644.32	2,932.01	2.05	3,57E-38	-(Upstream Emissions, ton/yr) x (20 yr GWP)

<sup>1</sup> Emission factors from the Appendix of NYSDEC "2024 NYS Statewide GHG Emissions Report", Table A1.  
<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations.)

2 PTE - Direct GHG Emissions from Combustion of Natural Gas

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Combustion Emission Factor (kg/MMBtu)	63.04	1.0E-03	1.0E-04	---	
Combustion Emission Factor (lb/MMBtu)	116.7	2.2E-03	2.2E-04	---	-(Combustion Emission Factor, kg/MMBtu) x (2.2 lb / kg)
Combustion Emissions (lb/yr)	1.37E+07	2.6E-02	2.6E-01	---	-(Maximum Natural Gas Usage, MMBtu/yr) x (Combustion EF, lb/MMBtu)
Combustion Emissions (ton/yr)	6,85E+03	1.3E-01	1.3E-01	---	-(Combustion Emissions, lb/yr) x (ton/ 2000 lb)
20-yr Global Warming Potential (GWP) <sup>1</sup>	1	84	284	---	
Combustion Emissions as CO <sub>2</sub> e (ton/yr)	6,851	10.85	3.81	8,865	-(Combustion Emissions, ton/yr) x (20 yr GWP)

<sup>1</sup> Emission factors from 40 CFR PART 98 Subpart C, Tables C-1 & C-2.  
<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations.)

3 PTE - Total GHG Emissions from Use of Natural Gas

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Total Emissions (ton/yr)	7,496	35.03	0.02	---	-(Upstream GHG Emissions, tons/yr) + (Direct GHG Emissions, tons/yr)
Total Emissions as CO <sub>2</sub> e (ton/yr)	7,495	2,933	5.46	10,434	-(Upstream GHG Emissions, tons as CO <sub>2</sub> e/yr) + (Direct GHG Emissions, tons as CO <sub>2</sub> e/yr)
Total Emissions as CO <sub>2</sub> e (metric tonnes/yr)	6,802	2,870	4.99	9,675	-(Total Emissions as CO <sub>2</sub> e, tons/yr) x (0.9072 metric tonnes/ ton)

4 PTE - Emissions of Co-Pollutants (Hazardous Air Pollutants) from Combustion of Natural Gas

	POTENTIAL TO EMIT FOR CO-POLLUTANTS													TOTAL HAPs <sup>2</sup>		
	TOTAL POM	Formaldehyde	Benzene	Naphthalene	Toluene	Hexane	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Lead	Manganese		Mercury	Nickel
Emission Factor (lb/MMBtu)	6.8E-07	7.35E-06	2.02E-06	5.98E-07	3.33E-06	1.76E-03	1.15E-08	1.08E-06	1.37E-06	8.28E-08	4.90E-07	3.78E-07	2.55E-07	2.00E-06	2.35E-08	
Emissions (lb/yr)	8.01E-02	8.03E-01	2.42E-01	7.02E-02	3.91E-01	2.07E-02	2.36E-02	1.38E-03	1.27E-01	1.61E-01	9.67E-03	5.75E-02	4.37E-02	2.99E-02	2.42E-01	2.76E-03
Emissions (ton/yr)	4.01E-05	4.37E-03	1.21E-04	3.51E-05	1.96E-04	1.04E-01	1.15E-05	6.90E-07	6.33E-05	8.06E-05	4.83E-06	2.88E-05	2.19E-05	1.50E-05	1.21E-04	1.38E-06
Natural Gas	NO <sub>x</sub>	CO	SO <sub>x</sub>	Total PM	VOCs											
Emission Factor (lb/MMBtu)	9.88E-02	8.24E-02	8.88E-04	7.45E-03	3.35E-03											
Emissions (lb/yr)	11,508.24	9,666.92	69.05	874.63	632.95											

<sup>1</sup> Emission factors (lb/MMBtu fuel input) taken from AP-42, Section 1.4 ("Natural Gas Combustion"), Tables 1.4.2, 1.4.3 & 1.4.4.  
<sup>2</sup> Naphthalene is a listed HAP as well as part of "TOTAL POM". For the computation of "TOTAL HAPs", the value for "Naphthalene" as a listed HAP has been excluded so that Naphthalene is not double-counted.

POTENTIAL TO EMIT GHG'S FOR IDENTIFIED SOURCES FIRING MOTOR DIESEL

0 Process Information

COMMENTS	
Maximum Heat Input for Diesel (MMBtu/yr) =	82 Based on the highest diesel usage of the past 5 years (occurred in 2023)

1 PTE - "Upstream" GHG Emissions Resulting from Extraction, Production & Transmission of Diesel

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Upstream Emission Factor (g/MMBtu) <sup>1</sup>	13.542	115	0.25	23,249	
Upstream Emission Factor (lb/MMBtu)	29.828	2,538.01	5.5E-04	37,277	- (Upstream Emission Factor (g/MMBtu) x (lb / 454 g))
Upstream Emissions (lb/yr)	2,445	21	0.05	4,199	- (Maximum Diesel Usage: MMBtu/yr) x (Upstream Emission Factor (lb/MMBtu))
Upstream Emissions (ton/yr)	1.22E+00	1.04E-02	2.3E-05	2.3	- (Upstream Emissions (lb/yr) x (ton / 2000 lb))
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---	
Upstream Emissions as CO <sub>2</sub> e (ton/yr)	1.22	0.87	0.006	2.10	- (Upstream Emissions (ton/yr) x (20 yr GWP))

<sup>1</sup> Emission factors from the Appendix of WISDEC "2024 WIS Statewide GHG Emissions Report", Table A.1.

<sup>2</sup> GWP values from 6 IPCC 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations).

2 PTE - Direct GHG Emissions from Combustion of Diesel

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Combustion Emission Factor (g/MMBtu) <sup>1</sup>	73.96	3.0E-03	6.0E-04	---	
Combustion Emission Factor (lb/MMBtu)	162.7	6.6E-03	1.3E-03	---	- (Combustion Emission Factor (g/MMBtu) x (2.2 lb / kg))
Combustion Emissions (lb/yr)	13,342	0.5	0.11	---	- (Maximum Diesel Usage: MMBtu/yr) x (Combustion Emission Factor (lb/MMBtu))
Combustion Emissions (ton/yr)	6,508+00	2.7E-04	5.4E-05	---	- (Combustion Emissions (lb/yr) x (ton / 2000 lb))
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---	
Combustion Emissions as CO <sub>2</sub> e (ton/yr)	6.51	0.02	0.01	6.73	- (Combustion Emissions (ton/yr) x (20 yr GWP))

<sup>1</sup> Emission factors from 40 CFR Part 98 Subpart C, Tables C-1 & C-2.

<sup>2</sup> GWP values from 6 IPCC 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations).

3 PTE - Total GHG Emissions from Use of Diesel

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Total Emissions (ton/yr)	7.89	0.01	7.67E-05	8.81	- (Upstream GHG Emissions (ton/yr) + (Direct GHG Emissions (ton/yr))
Total Emissions as CO <sub>2</sub> e (ton/yr)	7.89	0.10	0.12	8.81	- (Upstream GHG Emissions (ton as CO <sub>2</sub> e/yr) + (Direct GHG Emissions (ton as CO <sub>2</sub> e/yr))
Total Emissions as CO <sub>2</sub> e (metric tonnes/yr)	7.16	0.81	0.02	7.99	- (Total Emissions as CO <sub>2</sub> e (ton/yr) x (0.9072 metric tonnes/ ton))

4 PTE - Emissions of Co-Pollutants (Hazardous Air Pollutants) from Combustion of Motor Diesel

	POTENTIAL TO EMIT FOR CO-POLLUTANTS							
	TOTAL POM	Formaldehyde	Benzene	Acetaldehyde	Acrolein	1,3-Butadiene	Toluene	Xylenes
Emission Factor (lb/MMBtu) <sup>1</sup>	1.68E-04	1.18E-03	9.33E-04	7.67E-04	9.25E-05	3.91E-05	4.09E-04	2.85E-04
Emissions (lb/yr)	0.01	0.73	0.08	0.06	0.006	0.003	0.02	0.02
Emissions (ton/yr)	6.99E-06	4.84E-05	3.58E-05	3.14E-05	3.75E-06	1.62E-06	1.28E-05	1.17E-05
BaseFuel <sup>2</sup>	NO <sub>x</sub>	CO	SO <sub>2</sub>	Total PM	VOCs			
Emission Factor (lb/MMBtu)	ARLEET	ARLEET	ARLEET	ARLEET	ARLEET			
Emissions (lb/yr)	2.33	0.82	0.04	1.05	0.10			
Emissions (ton/yr)	1.18E-03	4.10E-04	2.00E-05	3.25E-04	5.00E-05			

<sup>1</sup> Since mobile source HAP emission factors are unavailable, emission factors are taken from AP-42, Section 3.31 ("Gasoline and Diesel Industrial Engines"), Table 3.3.2.

<sup>2</sup> Calculated using the ARLEET Tool: <https://ofvet.eisa.aot.gov/ofvet>

POTENTIAL TO EMIT GHG'S FOR IDENTIFIED SOURCES FIRING PROPANE

0 Process Information

	COMMENTS
Maximum Heat Input for Propane (MMBtu/yr)	669 Based on the highest propane usage of the past 5 years (occurred in 2021)

1 PIE - "Upstream" GHG Emissions Resulting from Extraction, Production & Transmission of Propane

	GREENHOUSE GASES			TOTAL CO2e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Upstream Emission Factor (g/MMBtu) <sup>1</sup>	16.429	119	0.27	26.164	
Upstream Emission Factor (lb/MMBtu)	36.187	0.26	5.9E-04	37.674	$\times (\text{Upstream Emission Factor, g/MMBtu}) \times \text{lb} / 454 \text{ g}$
Upstream Emissions (lb/yr)	24,209.25	175.35	0.40	6,770.006	$\times (\text{Maximum Propane Usage, MMBtu/yr}) \times (\text{Upstream EF, lb/MMBtu})$
Upstream Emissions (ton/yr)	12.10	0.09	1.99E-04	3.385.00	$\times (\text{Upstream Emissions, lb/yr}) \times (1 \text{ ton} / 2000 \text{ lb})$
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---	
Upstream Emissions as CO2e (ton/yr)	12.10	7.35	0.05	19.52	$\times (\text{Upstream Emissions, ton/yr}) \times (20 \text{ yr GWP})$

<sup>1</sup> Emission factors from the Appendix of NYSDEC, 2024 NYS Statewide GHG Emissions Report - Table A.1  
<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations.)

2 PIE - Direct GHG Emissions from Combustion of Propane

	GREENHOUSE GASES			TOTAL CO2e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Combustion Emission Factor (g/MMBtu) <sup>1</sup>	62.87	5.0E-03	6.0E-04	---	
Combustion Emission Factor (lb/MMBtu)	138.3	6.6E-03	1.3E-03	---	$\times (\text{Combustion Emission Factor, kg/MMBtu}) \times 2.2 \text{ lb} / \text{kg}$
Combustion Emissions (lb/yr)	92.532	4.42	0.88	---	$\times (\text{Maximum Propane Usage, MMBtu/yr}) \times (\text{Combustion EF, lb/MMBtu})$
Combustion Emissions (ton/yr)	4.62661	2.2143	4.4104	---	$\times (\text{Combustion Emissions, lb/yr}) \times (1 \text{ ton} / 2000 \text{ lb})$
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---	
Combustion Emissions as CO2e (ton/yr)	46.27	0.19	0.12	46.57	$\times (\text{Combustion Emissions, ton/yr}) \times (20 \text{ yr GWP})$

<sup>1</sup> Emission factors from 40 CFR Part 98 Subpart C, Tables C-1 & C-2  
<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations.)

3 PIE - Total GHG Emissions from Use of Propane

	GREENHOUSE GASES			TOTAL CO2e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Total Emissions (ton/yr)	58.37	0.09	4.0E-04	---	$\times (\text{Upstream GHG Emissions, ton/yr}) + (\text{Direct GHG Emissions, ton/yr})$
Total Emissions as CO2e (ton/yr)	58.37	7.52	0.17	66.09	$\times (\text{Upstream GHG Emissions, ton as CO2e/yr}) + (\text{Direct GHG Emissions, ton as CO2e/yr})$
Total Emissions as CO2e (metric tonnes/yr)	52.95	6.85	0.10	59.98	$\times (\text{Total Emissions as CO2e, ton/yr}) \times (10 / 1012 \text{ metric tonnes}) / (1 \text{ ton})$

4 PIE - Emissions of Co-Pollutants (Hazardous Air Pollutants) from Combustion of Propane

	POTENTIAL TO EMIT FOR CO-POLLUTANTS																
	TOTAL POM	Formaldehyde	Benzene	Naphthalene	Toluene	Hexane	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Lead	Manganese	Mercury	Nickel	Selenium	TOTAL HAPs <sup>1</sup>
Emission Factor (lb/MMBtu) <sup>1</sup>	6.83E-07	7.35E-05	2.06E-06	5.95E-07	3.33E-06	1.76E-03	1.96E-07	1.15E-08	1.08E-06	1.37E-06	8.24E-08	4.90E-07	3.73E-07	2.55E-07	2.06E-06	2.35E-08	---
Emissions (lb/yr)	4.57E-04	4.97E-05	3.89E-03	4.05E-04	0.002	1.10	1.21E-04	7.87E-06	7.21E-04	9.18E-04	5.51E-05	3.25E-04	1.49E-04	1.71E-04	1.39E-03	1.57E-05	0.24
Emissions (ton/yr)	2.28E-07	2.48E-05	6.89E-07	2.02E-07	1.12E-06	5.92E-04	6.56E-08	3.9E-09	3.61E-07	4.59E-07	2.79E-08	1.64E-07	1.25E-07	8.53E-08	6.89E-07	7.87E-09	0.0002
Propane <sup>2</sup>		NO <sub>x</sub>	CO	SO <sub>x</sub>	Total PM <sub>10</sub>	VOCs											
Emission factor (lb/MMBtu)		AR11E1	AR11E1	AR11E1	AR11E1	AR11E1											
Emissions (lb/yr)		130.09	1,124.92	0.00	20.16	14.07											
Emissions (ton/yr)		6.50E-02	6.62E-01	0.0E+00	1.01E-02	7.04E-03											

<sup>1</sup> Since mobile source HAP emission factors are unavailable, emission factors are taken from AP-42, Section 3.3.1 ("Gasoline and Diesel Industrial Engines"), Table 3.3-2.  
<sup>2</sup> Calculated using the AR11E1 Tool: <https://ghet.ema.ny.gov/ghet/>

POTENTIAL TO EMIT GHG'S FOR IDENTIFIED SOURCES FIRING MOTOR GASOLINE

0 Process Information

COMMENTS	
Maximum Heat Input for Gasoline (MMBtu/yr)	18
Based on the highest gasoline usage of the past 5 years (occurred in 2023)	

1 PTE: "Upstream" GHG Emissions Resulting from Extraction, Production & Transmission of Gasoline

	GREENHOUSE GASES				TOTAL CO2e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O			
Upstream Emission Factor (g/MMBtu) <sup>1</sup>	18.38	1.24	0.02	28.570		
Upstream Emission Factor (lb/MMBtu)	40.39	0.27	0.00	62.93		<sup>1</sup> Upstream Emission Factor (g/MMBtu) x lb / 454 g
Upstream Emissions (lb/yr)	2,780.71	0.12	0.02	5,100.22		<sup>2</sup> Maximum Gasoline Usage (MMBtu/yr) x Upstream EF (lb/MMBtu)
Upstream Emissions (ton/yr)	1.39	5.94E-05	1.19E-05	2.58		<sup>3</sup> (Upstream Emissions (lb/yr) / (ton/2000 lb))
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---		
Upstream Emissions as CO2e (ton/yr)	1.39	1.99E-03	5.14E-03	1.40		<sup>4</sup> (Upstream Emissions (ton/yr) x (20-yr GWP))

<sup>1</sup> Emission factors from the Appendix of NYSDOL 2024 NYS Statewide GHG Emissions Report - Table A.1.

<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations).

2 PTE: Direct GHG Emissions from Combustion of Gasoline

	GREENHOUSE GASES				TOTAL CO2e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O			
Combustion Emission Factor (g/MMBtu) <sup>1</sup>	70.22	3.0E-03	6.0E-04	---		
Combustion Emission Factor (lb/MMBtu)	154.5	0.007	0.001	---		<sup>1</sup> Combustion Emission Factor (g/MMBtu) x (1.2 / lb / 454 g)
Combustion Emissions (lb/yr)	2,781	0.12	0.02	---		<sup>2</sup> Maximum Gasoline Usage (MMBtu/yr) x Combustion EF (lb/MMBtu)
Combustion Emissions (ton/yr)	1.39	5.94E-05	1.19E-05	---		<sup>3</sup> (Combustion Emissions (lb/yr) / (ton/2000 lb))
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---		
Combustion Emissions as CO2e (ton/yr)	1.39	0.005	0.003	1.40		<sup>4</sup> (Combustion Emissions (ton/yr) x (20-yr GWP))

<sup>1</sup> Emission factors from 40 CFR Part 98 Subpart C, Tables C-1 & C-2.

<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations).

3 PTE: Total GHG Emissions from Use of Gasoline

	GREENHOUSE GASES				TOTAL CO2e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O			
Total Emissions (ton/yr)	2.78	1.19E-04	2.39E-05	---		<sup>1</sup> (Upstream GHG Emissions (ton/yr) + Direct GHG Emissions (ton/yr))
Total Emissions as CO2e (ton/yr)	2.78	0.01	0.01	2.80		<sup>2</sup> ((Upstream GHG Emissions (ton as CO2e/yr) + (Direct GHG Emissions (ton as CO2e/yr))
Total Emissions as CO2e (metric tonnes/yr)	2.52	0.01	0.01	2.54		<sup>3</sup> (Total Emissions as CO2e (ton/yr) x (0.9072 metric tonnes/ (ton)))

4 PTE: Emissions of Co-Pollutants (Hazardous Air Pollutants) from Combustion of Gasoline

	TOTAL POM						POTENTIAL TO EMIT FOR CO-POLLUTANTS					
	Formaldehyde	Benzene	Acrolein	Acrylonitrile	1,3-Butadiene	Toluene	Xylenes					
Emission Factor (lb/MMBtu) <sup>1</sup>	1.68E-04	1.18E-03	9.33E-04	7.67E-04	9.25E-05	3.91E-05	4.09E-04	2.85E-04				
Emissions (lb/yr)	0.003	0.02	0.02	0.01	0.002	0.001	0.01	0.01				
Emissions (ton/yr)	1.51E-06	1.04E-05	8.40E-06	6.93E-06	8.33E-07	3.52E-07	3.48E-06	2.51E-06				
Gasoline <sup>2</sup>	NO <sub>x</sub>	CO	SO <sub>2</sub>	Total PM <sub>10</sub>	VOCs							
Emission Factor (lb/MMBtu)	ARLEET	ARLEET	ARLEET	ARLEET	ARLEET							
Emissions (lb/yr)	0.04	1.50	0.00	0.03	0.13							
Emissions (ton/yr)	2.00E-05	1.50E-04	0.00E+00	1.50E-05	6.50E-05							

<sup>1</sup> Since mobile source (MAP) emission factors are unavailable, emission factors are taken from AP-42, Section 3.1 ("Gasoline and Diesel Industrial Engines"), Table 3.1-2.

<sup>2</sup> Calculated using the ARLEET Tool: <https://efleet.evia.aol.gov/efleet>











AFLEET Off-Road Inputs

2020

Off Road Equipment	Fuel Type	Horsepower	Hours/year
Railcar Mover Switchmaster 9000	Diesel	140	38
John Deere Tractor 5400	Diesel	70	3
Hyster S50ft Forklift	Propane	110	209
Hyster S50ft Forklift	Propane	110	209
Hyster S80XL2BC Forklift	Propane	200	209
Hyster S80XL2BC Forklift	Propane	200	209
Hyster H50FT Forklift	Propane	110	209
JLG 451C Boom Lift	Diesel	23	75
JLG450AJ	Propane	61	156

2021

Off Road Equipment	Fuel Type	Horsepower	Hours/year
Railcar Mover Switchmaster 9000	Diesel	140	52
John Deere Tractor 5400	Diesel	70	4
Hyster S50ft Forklift	Propane	110	254
Hyster S50ft Forklift	Propane	110	254
Hyster S80XL2BC Forklift	Propane	200	254
Hyster S80XL2BC Forklift	Propane	200	254
Hyster H50FT Forklift	Propane	110	254
JLG 451C Boom Lift	Diesel	23	78
JLG450AJ	Propane	61	156

2022

Off Road Equipment	Fuel Type	Horsepower	Hours/year
Railcar Mover Switchmaster 9000	Diesel	140	48
John Deere Tractor 5400	Diesel	70	4
Hyster S50ft Forklift	Propane	110	300
Hyster S50ft Forklift	Propane	110	300
Hyster S80XL2BC Forklift	Propane	200	300
Hyster S80XL2BC Forklift	Propane	200	300
Hyster H50FT Forklift	Propane	110	300
JLG 451C Boom Lift	Diesel	23	78
JLG450AJ	Propane	61	156

2023

Off Road Equipment	Fuel Type	Horsepower	Hours/year
Railcar Mover Switchmaster 9000	Diesel	140	44
John Deere Tractor 5400	Diesel	70	3
Hyster S50ft Forklift	Propane	110	188
Hyster S50ft Forklift	Propane	110	188
Hyster S80XL2BC Forklift	Propane	200	188

Hyster S80XL2BC Forklift	Propane	200	188
Hyster H50FT Forklift	Propane	110	188
JLG 451C Boom Lift	Diesel	23	78
JLG450AJ	Propane	61	156

2024

Off Road Equipment	Fuel Type	Horsepower	Hours/year
Railcar Mover Switchmaster 9000	Diesel	140	37
John Deere Tractor 5400	Diesel	70	3
Hyster S50ft Forklift	Propane	110	213
Hyster S50ft Forklift	Propane	110	213
Hyster S80XL2BC Forklift	Propane	200	213
Hyster S80XL2BC Forklift	Propane	200	213
Hyster H50FT Forklift	Propane	110	213
JLG 451C Boom Lift	Diesel	23	78
JLG450AJ	Propane	61	156

Off-Road Equipment AFLEET Results - Combined

2020

Pollutant	lbs./year
CO	898.27
NOx	94.67
PM10	8.65
PM2.5	6.78
VOC	0.03
SOx	10.85

2021

Pollutant	lbs./year
CO	1010.87
NOx	113.66
PM10	9.41
PM2.5	8.147
VOC	0.04
SOx	12.5

2022

Pollutant	lbs./year
CO	1125.69
NOx	132.27
PM10	10.97
PM2.5	9.49
VOC	0.03
SOx	14.16

2023

Pollutant	lbs./year
CO	845.91
NOx	86.33
PM10	7.14
PM2.5	6.2
VOC	0.03
SOx	10.1

2024

Pollutant	lbs./year
CO	908.23
NOx	96.27
PM10	7.98
PM2.5	6.9
VOC	0.03
SOx	11

**AFLEET On-Road Inputs**

On Road Equipment	Fuel Type	Average Miles/year <sup>1</sup>
Pickup Truck	Gasoline	400

<sup>1</sup> Specific annual mileage unavailable

**On-Road Equipment AFLEET Results**

Pollutant	lbs/year
CO	1.5
NOx	0.04
PM10	0.02
PM2.5	0.01
VOC	0.15
SOx	0

Future RTO	
Rated Capacity:	4 MMBtu/hr
Assumed to operate:	8,760 hrs/yr
PTE Natural Gas Usage:	35,040 MMBtu/yr

1 PTE - "Upstream" GHG Emissions Resulting from Extraction, Production & Transmission of Natural Gas

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Upstream Emission Factor (g/MMBtu) <sup>1</sup>	4.994	2.70	0.06	27.647	
Upstream Emission Factor (lb/MMBtu)	10.978	5.95E-01	1.3E-04	60.883	=(Upstream Emission Factor, g/MMBtu) x (lb / 454 g)
Upstream Emissions (lb/yr)	3.85E+05	2.05E+04	4.6E+00	2.13E+06	=(Maximum Natural Gas Usage, MMBtu/yr) x (Upstream Ef., lb/MMBtu)
Upstream Emissions (ton/yr)	192.33	10.42	0.00	1.07E+03	=(Upstream Emissions, lb/yr) x (ton/2000 lb)
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---	
Upstream Emissions as CO <sub>2</sub> e (tons/yr)	192.33	8.75	0.81	1.068	=(Upstream Emissions, ton/yr) x (20-yr GWP)

<sup>1</sup> Emission factors from the Appendix of NYSDep "2025 NYS Statewide GHG Emissions Report", Table A1.

<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations).

2 PTE - Direct GHG Emissions from Combustion of Natural Gas

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Combustion Emission Factor (kg/MMBtu) <sup>1</sup>	53.06	1.6E-03	1.2E-04	---	
Combustion Emission Factor (lb/MMBtu)	116.7	2.2E-03	2.2E-04	---	=(Combustion Emission Factor, kg/MMBtu) x (2.2 lb / kg)
Combustion Emissions (lb/yr)	4.1E+06	7.7E+01	7.7E+00	---	=(Maximum Natural Gas Usage, MMBtu/yr) x (Combustion Ef., lb/MMBtu)
Combustion Emissions (tons/yr)	2.05E+03	3.9E-02	3.9E-03	---	=(Combustion Emissions, lb/yr) x (ton/2000 lb)
20-yr Global Warming Potential (GWP) <sup>2</sup>	1	84	264	---	
Combustion Emissions as CO <sub>2</sub> e (tons/yr)	2.045	3.24	1.02	2.049	=(Combustion Emissions, ton/yr) x (20-yr GWP)

<sup>1</sup> Emission factors from 40 CFR Part 98 Subpart C, Tables C-1 & C-2.

<sup>2</sup> GWP values from 6 NYCRR 496.5. (NOTE: These values reflect the 20-year GWP values for each compound. These values differ from the 100-yr GWP values that are used for permitting and NSR evaluations).

3 PTE - Total GHG Emissions from Use of Natural Gas

	GREENHOUSE GASES			TOTAL CO <sub>2</sub> e (20 yr GWP)	NOTES
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O		
Total Emissions (tons/yr)	2,237	10	6.17E-03	---	=(Upstream GHG Emissions, tons/yr) + (Direct GHG Emissions, tons/yr)
Total Emissions as CO <sub>2</sub> e (tons/yr)	2,237	878	1.63	3,118	=(Upstream GHG Emissions, tons as CO <sub>2</sub> e/yr) + (Direct GHG Emissions, tons as CO <sub>2</sub> e/yr)
Total Emissions as CO <sub>2</sub> e (metric tonnes/yr)	2,030	797	1.48	2,828	=(Total Emissions as CO <sub>2</sub> e, tons/yr) x (0.9072 metric tonnes/ ton)

4 PTE - Emissions of Co-Pollutants (Hazardous Air Pollutants) from Combustion of Natural Gas

	TOTAL POM	POTENTIAL TO EMIT FOR CO-POLLUTANTS (= HAZARDOUS AIR POLLUTANTS)														TOTAL HAPs <sup>2</sup>	
		Formaldehyde	Benzene	Naphthalene	Toluene	Hexane	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Lead	Manganese	Mercury	Nickel		Selenium
Emission Factor (lb/MMBtu) <sup>1</sup>	6.83E-07	7.35E-05	2.06E-06	5.98E-07	3.33E-06	1.74E-03	1.96E-07	1.18E-08	1.08E-06	1.37E-06	8.24E-08	4.90E-07	3.73E-07	2.55E-07	2.06E-06	2.35E-08	---
Emissions (lb/yr)	2.63E-09	2.83E-07	7.94E-09	2.31E-09	1.28E-08	6.80E-06	7.56E-10	4.53E-11	4.16E-09	5.29E-09	3.17E-10	1.89E-09	1.44E-09	9.82E-10	7.94E-09	9.07E-11	7.13E-06
Emissions (ton/yr)	1.32E-12	1.42E-10	3.97E-12	1.15E-12	6.42E-12	3.40E-09	3.78E-13	2.27E-14	2.08E-12	2.65E-12	1.59E-13	9.45E-13	7.18E-13	4.91E-13	3.97E-12	4.53E-14	3.57E-09

<sup>1</sup> Emission factors (lb/MMBtu) (all (g/mol) taken from AP-42, Section 1.4 (Natural Gas Combustion), Tables 1.4-2, 1.4-3 & 1.4-4.

<sup>2</sup> Naphthalene is a listed HAP as well as part of "TOTAL POM". For the computation of "TOTAL HAPs", the value for "Naphthalene" as a listed HAP has been excluded so that Naphthalene is not double-counted.



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## ATTACHMENT C BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS: SPARKLER FILTER



# Best Available Control Technology (BACT) Evaluation

Sparkler Filter VOC Emissions; DEC ID  
No. 9-2911-00036

PREPARED FOR



The Goodyear Tire & Rubber  
Company

DATE

4 March 2026

REFERENCE

0771139.03



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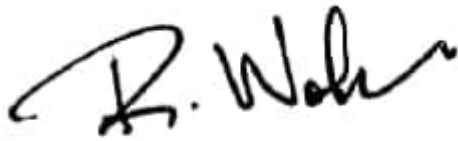
# Best Available Control Technology (BACT) Evaluation

Sparkler Filter VOC Emissions; DEC ID No. 9-2911-00036  
0771139.03



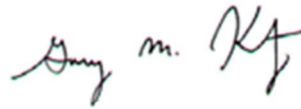
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## ACRONYMS AND ABBREVIATIONS

Acronym	Description
ACGIH	American Congress of Governmental Industrial Hygienists
AGC	Annual Guideline Concentration
ASF	Air State Facility Permit
BACT	Best Available Control Technology
cfm	Cubic feet per minute
ERM	ERM Consulting & Engineering, Inc.
Goodyear	The Goodyear Tire & Rubber Company
KWh	kilowatt-hours
lbs	pounds
NSPS	New Source Performance Standards
NYSDEC	New York State Department of Environmental Conservation
NESHAP	National Emissions Standards for Hazardous Air Pollutants
PSD	Prevention of Significant Deterioration
RBLC	EPA's RACT/BACT/LAER Clearinghouse
RTO	Regenerative Thermal Oxidizer ( <i>aka</i> , recuperative/regenerative incineration)
UV/AO	Ultraviolet/Activated Carbon Oxidation
VOC	Volatile Organic Compound

## EXECUTIVE SUMMARY

The Goodyear Tire & Rubber Company (“Goodyear”) owns and operates a manufacturing plant located at 5500 Goodyear Drive in the City of Niagara Falls, New York (“Goodyear Facility” or “Facility”) that produces an antioxidant product used in the manufacturing of vehicle tires and other products. In 2010, Goodyear submitted documentation to the New York State Department of Environmental Conservation (“NYSDEC” or the “Department”) of the Best Available Control Technology (BACT) analysis for feasibility of controlling air emissions of Volatile Organic Compounds (VOCs) from the Facility’s Sparkler Filter. That BACT analysis found that control of VOCs emissions may be technically feasible; however, the capital and operational costs associated with air emissions control from the Sparkler Filter were not economically feasible, based on the limited number of batches allowed by permit condition. The Department’s review of the Goodyear 2010 BACT submittal documentation concluded that “in consideration of the actual AGC impact and the restriction of 238 batches per year, no control will be accepted as BACT.” (See ASF Permit Condition 2-7.2, Mod 2/Active).

Operation of the Sparkler Filter process has not changed since the 2010 BACT submittal, nor has the restriction on the limited number batches allowed per year; however, at the Department’s request, Goodyear conducted an updated BACT analysis for the VOC emissions from the Sparkler Filter. The following sections in this document reflect an updated BACT evaluation for the Sparkler Filter for emissions of VOCs.

Consistent with the previous 2010 BACT determination, this updated BACT Analysis reached the same conclusion – that in consideration of the limited operation of the Sparkler Filter, the restriction of 238 batches per year, and the Facility’s ability to comply with the Part 212 guideline concentrations, no further control is found to be necessary or acceptable as BACT.

## 1. REGULATORY BACKGROUND

Consistent with the Goodyear facility's Air State Facility permit and 6 NYCRR Part 212, where a source owner can demonstrate to the satisfaction of the commissioner that it will apply Best Available Control Technology (BACT), the commissioner may specify a less restrictive permissible emission rate, emission standard or degree of air cleaning for such source than is required by Part 212. This document serves as a BACT evaluation for the Sparkler Filter process for VOC emissions.

## 2. FACILITY DESCRIPTION

The Goodyear Facility located in Niagara Falls, New York manufactures an antioxidant that is primarily used in vehicle tire manufacturing. The antioxidant product provides the tires with long-term protection from oxygen and ozone deterioration. In 2024, Goodyear manufactured 12.2 million pounds of the antioxidant Nailax, also known as Polystay 100. Note that Goodyear previously manufactured two other products, Polystay 100AZ and Polystay 200, but the facility has since ceased manufacturing of these two products.

## 3. SOURCE DESCRIPTION

### 3.1 SPARKLER FILTER

Goodyear has three reactors that are used to manufacture Nailax. Aniline and o-toluidine react in the presence of a catalyst in an o-xylene solvent. After the reaction is complete, the unreacted material, product impurities, water, and o-xylene are removed through degassers. Once the Nailax is formed, it is transferred from the degasser to the Nailax holding tanks. From the holding tanks, water and impurities are removed from the Nailax product primarily through the Centrifuge system; however, when the Centrifuge system is unavailable (due to routine maintenance or repair activities) the Facility relies upon the Sparkler Filter. Sparkler filters, also known as horizontal plate filters, work by forcing liquid through a series of stacked horizontal plates with filter media, such as filter paper or cloth, in between each layer. Liquid Nailax is allowed to pass through the center of the plates while solids (impurities) get trapped on the media. Once passed through the Sparkler Filter, the Nailax is then process steam-purged within the enclosed Sparkler Filter and subsequently either through a flaker or a pastillation process to make a final product that is bagged and shipped to customers. The spent filter media that contains the impurities is removed from the Sparkler Filter by opening the top of the Sparkler Filter after every second batch and using an overhead hoist to lift the filter media out of the vessel and moving the filter cage into the cage receiving basket where the spent filter media is manually stripped from the filter cage frame and disposed in a water-filled lugger prior to offsite disposal at a properly permitted disposal facility. The filter cage is then fitted with a new filter paper media and the filter cage is placed back into the Sparkler Filter for the next set of batch production runs. This filter changeout period during which the Sparkler Filter is opened to the indoor air within the building is normally ten to fifteen minutes.

There currently is no VOC emissions control required for the Sparkler Filter. To equip the Sparkler Filter with an air pollution control system, a slotted, horizontally-oriented plenum would need to be fabricated and installed behind the Sparkler Filter (and the filter receiving basket) and

equipped with a blower to draw air emissions from the open top of the Sparkler Filter and vent the emissions to an appropriate control device. To provide sufficient face velocity across the open top of the Sparkler Filter and the adjacent filter cleaning basket, ERM relied on ACGIH Industrial Ventilation Manual, 29<sup>th</sup> edition to estimate the flow needed to capture potential emissions and direct them through the side draft hood. The calculated flow rate needed to capture emissions from the Sparkler Filter was estimated to be 15,150 cubic feet per minute (cfm). The preliminary conceptual design requirements for the emissions ventilation system are provided in Appendix A to this report and used in the technical and economic feasibility for this BACT analysis.

ERM estimated the potential air contaminant VOC emissions from the Sparkler Filter for the maximum 15-minute period while the unit is open to the indoor air for the maximum number of batches per year (238) listed as a restriction in the Facility's Air State Facility Permit. The total VOCs that could be emitted from the Sparkler Filter have been calculated to be 0.042 pounds per batch (lbs/batch), 9.9 pounds per year (lbs/year) or 0.005 tons per year (tpy), based on 238 batches per year. These emissions calculations are provided in Appendix A to this report and are used in the economic feasibility of the BACT analysis.

## 4. TOP-DOWN BACT ANALYSIS

The "Top-Down" BACT approach is the methodology associated with the BACT process as part of the Clean Air Act's Prevention of Significant Deterioration (PSD) program. The intent of this specific BACT associated with the Goodyear Sparkler Filter is to demonstrate compliance with 6 NYCRR Part 212, a State-BACT process. While this evaluation is not a part of a PSD application or being driven by federal requirements, the "Top-Down" BACT approach is used in this evaluation as a reference for the New York State BACT analysis process.

### 4.1 CONTROL TECHNOLOGY DETERMINATION METHODOLOGY

In this BACT analysis, Goodyear is using the U.S. Environmental Protection Agency's (USEPA's) top-down approach for determining the feasibility of control technology for the Sparkler Filter process emissions. This control technology evaluation approach is used to establish the BACT emission limitation, unless the applicant can demonstrate (and the permitting authority agrees) that it is not "achievable" due to technical infeasibility, cost effectiveness, or potentially having other adverse environmental or energy consequences. Following this top-down approach, should the top control technology alternative be eliminated, then the next most stringent level of control is then evaluated. This process continues until BACT is selected. The five steps in a top-down BACT evaluation can be summarized as follows:

- Step 1. Identify all possible control technologies;
- Step 2. Eliminate technically infeasible options;
- Step 3. Rank the technically feasible control technologies by control effectiveness;
- Step 4. Evaluate most effective controls and document results; and
- Step 5. Select BACT.

The following sections contain a description of the five (5) basic steps of this “top-down” approach.

#### 4.1.1 STEP 1 – IDENTIFY ALL CONTROL OPTIONS

In this step, available control technologies with the practical potential for application to the emission source and regulated air contaminant(s) in question are identified. The selected control technologies vary widely depending on the process technology and contaminant being controlled. The application of demonstrated control technologies in other similar source categories to the emission unit in question may also be considered in this step.

The following resources are typically consulted when identifying potential technologies for criteria pollutants:

- EPA’s RACT/BACT/LAER Clearinghouse (RBLC) database;
- NSPS, NESHAP, and BACT requirements for similar operations; and/or
- Engineering experience with similar control applications.

There is no specific methodology to identify the available emission control technologies and levels for a given emission source or air contaminant. The most common source of this information is EPA’s RACT/BACT/LAER Clearinghouse (RBLC). Maintained by EPA, this searchable database of emissions control technology determinations is generally the best starting point for developing the required ranking of emissions control technologies and levels.

#### 4.1.2 STEP 2 – ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

In this step, “technically infeasible” control options from the list of “potentially available” control options are eliminated. A control option is “technically feasible” if it has been “demonstrated” or if it is both “available” and “applicable.”

#### 4.1.3 STEP 3 – RANK REMAINING CONTROL OPTIONS

All remaining technically feasible control options are ranked based on their overall control effectiveness for the pollutant under review. If there is only one remaining option or if all the remaining technologies could achieve equivalent control efficiencies, ranking based on control efficiency is not required. Collateral effects are usually not considered until step four of the five step top-down BACT analysis.

#### 4.1.4 STEP 4 – EVALUATION OF MOST EFFECTIVE CONTROL OPTION

After identifying and ranking available and technically feasible control technologies, the economic, environmental, and energy impacts are evaluated to select the best control option. If collateral impacts do not disqualify the top-ranked option from consideration, it is selected as the basis for the BACT limit.

Alternatively, in the judgment of the permitting agency, if economic, environmental, or energy considerations impact the top control option, the next most stringent option is evaluated. This process continues until a control technology is identified. This step validates the suitability of the

top control option identified or provides a clear justification as to why the top control option should not be selected as BACT.

#### 4.1.5 STEP 5 – SELECT BACT

In the final step, the BACT is determined for the emission source under review based on evaluations from the previous step.

## 5. SPARKLER FILTER VOC EMISSIONS CONTROL TECHNIQUES

This section focuses on the analysis of techniques to reduce VOC emissions from the Sparkler Filter.

### 5.1 STEP 1: IDENTIFY ALL POTENTIAL CONTROL OPTIONS

A RACT/BACT/LAER Clearinghouse review for VOC emission control for the Goodyear Sparkler Filter produced the following BACT determinations. Research into publicly available documentation identified control technologies that warranted further consideration. The technologies are identified as follows:

- Carbon Adsorption
- Ultraviolet/Activated Carbon (UV/AO) Oxidation
- Recuperative/Regeneration Oxidation
- Vapor Condensers

#### 5.1.1 CARBON ADSORPTION

Adsorption is a process by which VOCs are retained on the surface of granular solids. The solid adsorbent particles are highly porous and have very large surface area-to-volume ratios. Gas molecules penetrate the pores of the adsorbent and contact the large surface area available for adsorption. Organic vapors retained on the adsorbent are thereafter desorbed with both the adsorbate and adsorbent recovered. The adsorption process occurs primarily through two mechanisms: physical adsorption, in which electrostatic or van der Waals forces attract and hold gas molecules to the adsorbent surface, and chemical adsorption, in which the gas molecules are chemically bonded to the adsorbent. On a smooth surface, physical adsorption produces a layer of gas molecules not more than several molecules thick; however, within the capillaries of a porous solid, surface adsorption is supplemented by capillary condensation. Chemical adsorption produces an adsorbed gas layer only one molecule thick.

#### 5.1.2 ULTRAVIOLET/ACTIVATED CARBON OXIDATION (UV/AO)

This process uses ultraviolet (UV) light and activated oxygen/ozone to destroy VOCs. In some installations, a wet scrubber and carbon adsorption system are also employed. This combination of technologies may be capable of achieving VOC destruction and removal efficiency greater than 90 percent on a continuous basis in some applications (Shugarman, 1991).

There are three primary constituents of the typical UV/AO unit: activated oxygen, UV light and a water reactor. Activated oxygen is a term used to describe several oxygen-based oxidants. The primary constituent of AO is ozone, but also included are peroxides, oxygen radicals and hydroxyls. These compounds are generated by the UV light. Due to the short half-life of ozone, these compounds must be generated on-site. AO is a good oxidizer; in fact, it is 10 to 12 percent more reactive than ozone alone (Shugarman, 1991). Because the UV light can be tuned to a very narrow frequency, the oxidation reaction can be controlled to produce AO without by-product NOx.

The VOC emission stream passes through a photolytic reactor where the tuned UV light and injected oxidant begin to destroy the VOCs. Although the reactor designs are proprietary, important design considerations include the volume of air and concentration of VOCs in the exhaust stream. Following this stage, the gas flows through the water reactor. Ozonated water passes countercurrent to the up-flowing VOC-laden gas; soluble VOCs are absorbed and converted to CO<sub>2</sub> and water. A coalescer is used after this reactor to collect entrained water droplets. Finally, the gas is ducted to one of two carbon beds where remaining VOCs are adsorbed. Generally, 35 or 75 percent of the original VOCs have been removed prior to this stage (Shugarman, 1991), yielding 90% total VOC removal.

Each bed remains on-line for at least 24 hours (in some cases, the beds may remain on-line for three days) before they are regenerated. The beds are regenerated with the oxidant which converts the adsorbed VOCs to CO<sub>2</sub> and water. Thus, there is no VOC by-product for disposal. In addition, because the VOCs are not incinerated, by-products of combustion such as NOx, and CO are not produced.

Generation of activated oxygen by UV light has several advantages compared to other methods, such as corona discharge. UV light does not oxidize nitrogen in the ambient air, thereby eliminating the generation of NOx. In addition, because it operates at low temperatures, no water-cooling system is required. Maintenance and energy costs are minimal. Typically, the oxidative equivalent of one pound of ozone requires 3 to 5 kilowatt-hours (kWh) of energy.

### 5.1.3 RECUPERATIVE/REGENERATIVE OXIDATION

One potentially feasible technology for controlling virtually any dilute phase VOC emission is thermal oxidation. An efficient thermal oxidation design must provide adequate residence time for complete combustion, sufficiently high temperatures for VOC destruction, and adequate velocities to ensure proper mixing without quenching combustion.

In thermal oxidation, the VOC stream is delivered to a refractory-lined burner area by a blower. The combustible matter is thoroughly mixed with the burner flame in the upstream portion of the chamber and then passes through the remaining portion of the chamber where combustion is completed. Residence times of 0.5 to 1.0 seconds at temperatures ranging from 1,200 to 1,600°F are generally required for high destruction efficiency. Natural gas is typically used to maintain the required combustion temperature to combust the diluted mixtures.

Typical recuperative thermal oxidizers are equipped with a heat exchanger to recover thermal energy in the exhaust gas stream and use it to preheat the incoming VOC laden gas stream, thereby reducing the need for auxiliary natural gas for combustion. Thermal efficiencies up to 70

percent are possible with a standard recuperative heat exchanger. Regenerative thermal oxidizers use a ceramic heat exchange media, which can provide thermal efficiencies of up to 95 percent. To achieve this high thermal efficiency, hot exhaust gases are passed through the heat exchange media transferring thermal energy for storage. To reclaim this thermal energy, the flue gas inlet stream is directed through the heat exchange media chamber for preheating, and once combusted in a central combustion chamber, is passed through a different heat exchange media chamber to capture and store thermal energy for a subsequent preheating cycle. Aside from the ceramic media heat exchanger, regenerative systems operate in the same manner as recuperative thermal oxidizers.

Recuperative or regenerative thermal incinerators are particularly applicable to dilute VOC streams in which large quantities of air must be heated to control a low concentration of VOC, because the high level of heat recovery serves to reduce the operating costs significantly over once-through thermal incineration.

For purposes of this analysis, the required combustion temperature is assumed to be at least 1369°F (OAQPS, 1991). The VOC streams are so dilute they are assumed to contribute no appreciable heating value and therefore, the combustion temperature is attained solely from the combustion of natural gas. The heat recovery rate is assumed to be 70 percent for a recuperative oxidizer, and 95 percent for a regenerative oxidizer. The destruction efficiency of thermal oxidizers operating at design conditions is estimated to be 98 percent.

#### 5.1.4 VAPOR CONDENSERS

Condensation of VOC emissions in a gas stream involves converting gaseous VOC vapors to a liquid for recovery and potential re-use. Most VOCs can be reduced to liquid form by sufficiently lowering its temperature.

When a hot vapor laden stream is cooled, the kinetic energy of the vapor is reduced. The "excitation" of the vapor's molecules is slowed down, allowing them to occupy less space and crowd together. Van der Waals forces attract the molecules where they more densely combine to form droplets of liquid. These droplets are easily collected via gravity, thus removing the condensed VOC from the gas stream.

Most condensers for VOC control incorporate non-contact heat exchangers to allow recovery of the VOC product and to avoid generation of a VOC contaminated wastewater stream.

The primary design parameter for application of a condensation system is the temperature to which the VOC stream must be cooled for condensation to take place. It should be noted that the entire air stream must be cooled to this condensation temperature. Thus, condensation may not be economically feasible for very dilute/high volume air streams. Condensers may employ a circulating water system using a cooling tower for heat rejection, various refrigeration cycles, or cryogenic cooling systems employing liquid nitrogen.

## 5.2 STEP 2: ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

### 5.2.1 UV/AO OXIDATION

Ultraviolet/Activated Oxygen oxidation is not considered to represent a technically feasible VOC control technology for the Sparkler Filter based on the exhaust flow rate of the emissions source. Based on research into UV/AO, the optimal exhaust flow range is approximately 100 to 500 cubic meters per hour (~60 cfm to 300 cfm), with research pointing to reduced VOC control efficiency with exhaust flow rates outside of this range (EPA, 1995)<sup>1</sup>. The exhaust flow rate for the Sparkler Filter has been calculated to be 15,150 cfm. This technology has not been commercially proven to successfully treat a flow rate at this level with such a low VOC emission concentration, therefore rendering the UV/AO technology as a technically infeasible solution.

### 5.2.2 VAPOR CONDENSATION

Vapor condensation does not represent a technically feasible control technology for the Sparkler Filter due to the low concentration of VOCs present (0.04 lb/batch) in the exhaust stream along with the high exhaust flow rate (15,150 cfm). Typical minimum ranges for inlet concentrations ranges from 500-1000 ppmv.

## 5.3 STEP 3: RANK REMAINING CONTROL OPTIONS

When comparing the two remaining options of carbon adsorption and recuperative/regenerative oxidation, both methods have high potential control efficiencies greater than the minimum 90% control required by 6 NYCRR Part 212.

## 5.4 STEP 4: EVALUATION OF MOST EFFECTIVE CONTROL OPTION

### 5.4.1 RECUPERATIVE/REGENERATIVE OXIDIZER CONTROL

As previously stated in section 5.3 above, the recuperative/regenerative oxidation control option has been identified as the top-ranked control option for VOC emissions control. Based on costing information provided to Goodyear by a third party, the incremental capital investment associated with increasing the size of the planned installation of a regenerative thermal oxidizer (RTO) and the associated replacement Tri-Mer wet scrubber to accommodate the treatment/control of the VOC emissions from the limited operation of the Sparkler Filter is calculated to be \$1,021,779 USD. Since the planned RTO is being designed to achieve greater than 90% VOC emissions control efficiency, the unit cost to capture and control the Sparkler Filter VOC emissions through the upsized RTO is calculated to be \$229,124,144 per ton of VOC controlled. This unit cost per ton of VOC controlled does not include the incremental annual operating costs (i.e., additional natural gas and electricity use). By virtue of the incremental capital cost increase alone for treatment of VOC emissions from the Sparkler Filter, the upsizing of the planned RTO is not considered an

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<sup>1</sup> Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams, May 1995; <https://frtr.gov/matrix/documents/Vapor-Treatment/1995-Survey-of-Control-Technologies-for-Low-Concentration-Organic-Vapor-Gas-Streams.pdf>

economically feasible control option. See Appendix A for the cost analysis for the upgraded RTO capital costs.

#### 5.4.2 CARBON ADSORPTION OPTION

With the elimination of recuperative/regenerative oxidation as the top-ranked VOC control option, the other technically feasible control option would be the installation and operation of a carbon adsorption system for the control of VOC emissions from the limited use Sparkler Filter.

Using the 15,150 cfm flow rate design requirements needed for the slotted, horizontally-oriented plenum, ductwork and exhaust fan, costs were developed for the capital and annual operating costs to install a carbon adsorption system. The capital cost for the installation of a two-unit carbon adsorption system was estimated to be \$95,000 USD and the annual rental (operating) costs, as provided by Calgon Carbon Corporation, would \$72,000 USD annually. From these vendor quotes, the total annualized costs for the installation and operation of a two-unit carbon adsorption system would be \$81,676 USD, excluding utility costs. The capture and control system using carbon adsorption control results in a cost effectiveness value of \$18,315,049 per ton of VOC emissions removed, assuming greater than 90% control. Therefore, the option for installation and operation of a carbon adsorption control of VOC emissions from the limited use of the Sparkler Filter process is not considered an economically feasible option. A breakdown of the cost estimates for the installation and operation of a carbon adsorption system can be found in Appendix A.

### 5.5 STEP 5. SELECT BACT/CONCLUSION

In the absence of either technically or economically feasible control options, the existing permit condition restricting the number of batches processed by the Sparkler Filter, and the ability to comply with the guidance values for the speciated VOC emissions from the Sparkler Filter process BACT for the Sparkler Filter operation at the Goodyear Facility is considered to be no further control.



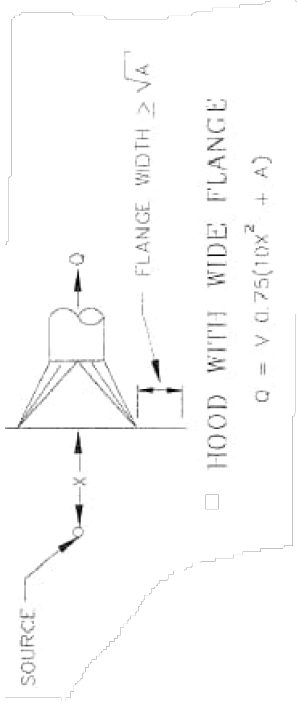
APPENDIX A

SPARKLER FILTER BACT ANALYSIS:  
EMISSIONS ESTIMATES AND CONTROL  
TECHNOLOGY COST ANALYSES

**Goodyear  
Sparkling Filter Preliminary Capture and Control Evaluation**

Date 8/25/2025

Side Draft Hood Air Flow required to achieve capture from source determined by:  
ACGIH Industrial Ventilation Manual (29th Edition)  
Hood with wide flange - assumed behind sparkling filter  
(Table 6-3)



**Design Basis:**

$Q = V * 0.75 * (10X^2 + A)$	Flow (cfm)
$Q =$ 15150	Capture velocity at distance X (fpm)
$V =$ 100	Distance from hood face to furthest point of emissions (ft)
$X =$ 4	Hood face area, L * W (ft <sup>2</sup> )
$A =$ 42	Length of hood (ft)
$L =$ 9.0	Width of hood (ft)
$W =$ 4.7	

**Emission Estimate - PTE**

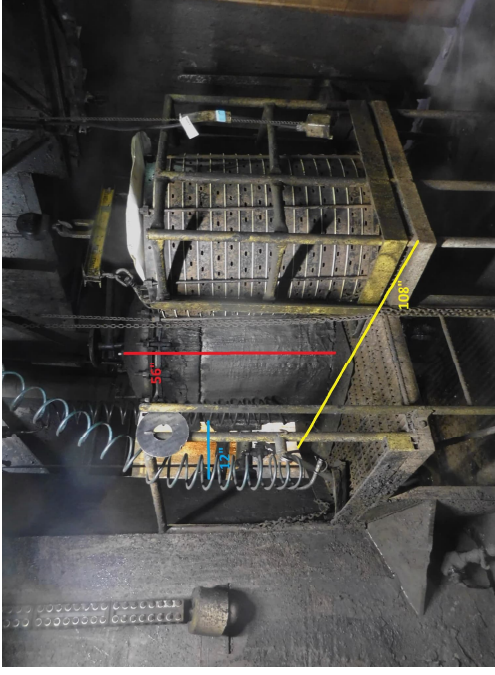
VOC	Lb/batch	0.05
	lb/year	9.9
	ton/yr	0.005

**Cost Recovery Factor - Capital Investment**

Equipment Life =	20	yrs
Interest Rate =	8	%
Capital Recovery Factor (CRF) =	0.10	

**Potential Control Alternatives**

**Carbon Adsorption**



VAPOR-PAC-10 (Calgon Corp)

Flow Capacity per unit = 10,000 cfm  
 # of units required = 2 units  
 Carbon per unit = 12,500 lb  
 Total Carbon Available = 25,000 lb  
 Placement fee per unit = 47,500 \$  
 Monthly Rental Fee per unit = 3,000 \$  
 Placement fee per (Total) = 80,000 \$  
 Annual Rental Fee (total) = 72,000 \$  
 First Year Total Cost = 152,000 \$

Carbon Use  
 Assume: lb Carbon/lb VOC = 0.1 lb/lb  
 Carbon required per year = 99 lb carbon/yr  
 Time to Unit Replacement = 252 yrs

10% adsorption eff\*  
 \*a conservative estimate based on the specification sheets for the VAPOR-PAC-10

Annualized Capital Cost = 8,148 \$  
 Total Annualized Cost = 81,676 \$

Cost Effectiveness - Carbon Adsorption  
 Based on Total Annualized Cost = 16,335,192 \$/ton  
 Monthly Rental Fee ONLY = 14,530,777 \$/ton

**Thermal Oxidizer**

GY planning to install Scrubber/RTO for process emissions  
 Current Design Flow = 9,300 SCFM  
 Equipment Cost = 1,300,000 \$  
 Additional Capacity Required = 15,150 SCFM  
 Total Flow = 24,450 SCFM  
 Equipment Cost (Adjusted) = 2,321,779 \$  
 Additional Cost to Treat Sparkling Filter = 1,021,779 \$

(Excludes sparkling filter)  
 Chemstress Quote (Sparkling filter)  
 (Includes sparkling filter)  
 (Assume six-tenths rule)

Cost Effectiveness - Thermal Oxidizer  
 Based on Additional Cost to treat Sparkling Filter = 206,211,730 \$/ton

Note: This figure does NOT include the incremental OPEX



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