Air Quality Impact Analysis

Hudson Logistics Center

Hudson, New Hampshire

Submitted to:

Town of Hudson New Hampshire
Planning Board
12 School Street
Hudson, NH 03051

Submitted by:

Langan Engineering
888 Boylston Street, Ste 510
Boston, MA 02199

Prepared by:

Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

REVISED November 30, 2020

Epsilon
ASSOCIATES INC.

Table of Contents

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

LIST OF FIGURES

Section 1.0

Introduction

1.0 INTRODUCTION

1.1 Project Description

The Hudson Logistics Center (HLC) proposes three high-tech distribution facilities on the Green Meadow Golf Club property off Lowell Road (Route 3A) in Hudson, New Hampshire (the "Project"). In June 2018, the Nashua Regional Planning Commission conducted a study for the Town called the "Hudson Economic Development Assessment" which identified the area where the Project is located as perhaps the greatest opportunity for both commercial and industrial development in Hudson and in the overall region. The proposed redevelopment Project is projected to create approximately 2,500 direct, and indirect, induced and construction jobs for the local community. Approximately 230 of the site's 374 acres will remain as green space – including significant natural buffers between the Merrimack River, adjoining neighborhoods and the development.

Logistics centers are hubs that play a vital role in America's supply chain. Logistics centers include buildings designed to efficiently store and distribute products around the region and ultimately to homes and businesses.

While a logistics center's operations include automation, the need for humans is essential to run the systems and assist with storing, sorting and distribution. The Hudson Logistics Center Project will include what is known to the industry as best-in-class buildings.

As part of the environmental analysis for this Project, air quality impacts from stationary sources located onsite, as well as potential impacts from Project-generated traffic, were evaluated for potential on-site and neighborhood impacts.

This Air Quality Impacts Study report outlines the procedures that were used to evaluate potential air quality impacts and describes the results of projected air quality impacts analysis for the Project. The procedures and analysis used for this report follow U.S. Environmental Protection Agency (U.S. EPA) and New Hampshire Department of Environmental Services (NHDES) guidance and other generally-recognized guidance, procedures and standards where applicable.

1.2 Purpose

This analysis has been prepared at the request of the Hudson Planning Department on behalf of the Hudson Planning Board, and has also been prepared to demonstrate whether the potential air quality impacts meet certain air quality standards as prescribed by the Town of Hudson Site Plan Review Ordinance under Section 275-6 (General Requirements). One of these requirements is to show that that adequate provisions be made for a development to demonstrate that the Project will not contribute to a condition of air pollution, and to guard against such conditions which would subject the nearby properties to "danger or injury to health or safety, and that no significant diminution in value of surrounding properties would be suffered." Additionally, the Project is required to reduce and/or eliminate elements of pollution, such as noise, smoke, soot, particulates or any other discharge, into the environment which might prove harmful to persons, structures or adjacent properties.[1]

To show that the Project will not cause any adverse air quality impacts, a detailed quantitative analysis has been performed. Pollutant emissions from onsite combustion sources, as well as from Project-generated traffic have been calculated and offsite concentrations have been estimated using U.S. EPA and NHDES regulatory approved methodology. Section 2 provides a description of the air quality standards used to show a project's regulatory compliance, as well as the existing air quality levels in the area. Section 3 details the analysis methodology, showing specific model and source inputs, describing the meteorological data, and presenting the analysis area. Section 4 presents the results of the analysis, other areas in which the Project will address air quality, and the final conclusions. Finally, the Attachments provide even more detail on the methodology used in the analysis.

This analysis, supplemented as noted below, demonstrates that any potential air pollution generated by the Project is well below applicable standards for health, safety, property and the environment, will not cause a condition of air pollution, and will not pose any danger of injury to health and safety or be harmful to persons, structures or properties. Therefore, the Project complies with the specific provisions of the Chapter 275 regulations with respect to potential air quality impacts as described above.

1.3 Revisions from July 28, 2020 Air Quality Analysis and Report

The following revisions were made to the prior report:

- Revised idle delay times at intersections based on Synchro outputs provided in the September 2020 TIS.

There were no changes in lot peak hour truck traffic, no changes in idle emission factors, no changes in temporal data and no changes to any stationary sources. The revisions resulted in minor changes to the results attributable to mobile sources, and the results attributable to the mobile and stationary sources combined. However, all predicted concentrations of both criteria pollutants and hazardous air pollutants remain well below all applicable U.S. EPA and NHDES thresholds which are designed to ensure health and safety and public welfare from any known or anticipated adverse effects associated with the presence of air pollutants, such as including but not limited to, potential damage to wetland resources, other vegetation and the environment.

[1] Town of Hudson (NH). Chapter 275. Site Plan Regulations. Sections 275-6(A) and (H).

1.4 Revisions from October 26, 2020 Air Quality Analysis and Report

Based on peer-review by Tetra Tech (Attachment D), the following revisions were made to the prior report:

- Further clarification of model inputs and assumptions were added to the text.
- Minor errors identified in the modeling analysis were fixed, and results were updated.

There were no changes to mobile sources inputs. The revisions resulted in insignificant changes to the results. All predicted concentrations of both criteria pollutants and hazardous air pollutants remain well below all applicable U.S. EPA and NHDES thresholds.

Section 2.0

National Ambient Air Quality Standards and Background Concentrations

2.0 NATIONAL AMBIENT AIR QUALITY STANDARDS AND BACKGROUND CONCENTRATIONS

Background air quality concentrations and federal air quality standards were utilized to conduct the air quality impact analyses for the Project. Specifically, the projected emissions associated with the Project were added to monitored background values and then compared to the Federal National Ambient Air Quality Standards (NAAQS) to demonstrate compliance with these standards. These standards were developed by the U.S. Environmental Protection Agency (U.S. EPA) to protect human health against adverse health effects with a margin of safety. The modeling methodologies are developed in accordance with the latest NHDES modeling policies and Federal modeling guidelines.[2] The following sections outline the NAAQS and detail the sources of background air quality data.

2.1 National Ambient Air Quality Standards

The 1970 Federal Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Federal Clean Air Act, the U.S. EPA promulgated NAAQS for the following criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in **Table 2-1**. New Hampshire Ambient Air Quality Standards (NHAAQS) are identical to NAAQS.[3] Such criteria pollutants are those which the U.S. EPA has determined to have the greatest potential for human health impacts and are the generally accepted pollutants of concern which are evaluated when conducting air quality impact studies of this nature.

NAAQS specify concentration levels for various averaging times and include both "primary" and "secondary" standards. Primary standards are intended to protect human health, whereas secondary standards are intended to protect public welfare from any known or anticipated adverse effects associated with the presence of air pollutants, such as damage to vegetation. The more stringent of the primary or secondary standards were applied when comparing to the modeling results for this Project.

Table 2-1 National Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS/NHAAQS ($\mu g/m^3$) Primary	Secondary
NO_2	Annual (1)	100	Same
	1-hour (2)	188	None
SO_2	3-hour (3)	None	1300
	1-hour (4)	196	None

2 40 CFR 51 Appendix W, Guideline on Air Quality Models, 82 FR 5182, Jan. 17, 2017

3 NAAQS will reference NAAQS and NHAAQS throughout this document.

Table 2-1 National Ambient Air Quality Standards (Continued)

Pollutant	Averaging Period	NAAQS/NHAAQS ($\mu g/m^3$) Primary	Secondary
PM2.5	Annual (1)	12	15
	24-hour (5)	35	Same
PM10	24-hour (3)	150	Same
CO	8-hour (3)	10,000	Same
	1-hour (3)	40,000	Same
Ozone	8-hour (6)	147	Same
Pb	3-month (1)	1.5	Same

Source: http://www.epa.gov/ttn/naaqs/criteria.html and ENV-A 300
(1) Not to be exceeded.
(2) 98th percentile of one-hour daily maximum concentrations, averaged over three years.
(3) Not to be exceeded more than once per year.
(4) 99th percentile of one-hour daily maximum concentrations, averaged over three years.
(5) 98th percentile, averaged over three years.
(6) Annual fourth-highest daily maximum eight-hour concentration, averaged over three years.

Compliance with the primary NAAQS is designed to assure, with an adequate margin of safety, a lack of significant public health risks. Because the primary NAAQS are solely health-based, they are not adjusted for factors such as technological feasibility, or costs and benefits. By incorporating a margin of safety, the NAAQS are set to address both uncertainties in the state of the science and the possibility of additional harms that might be identified in the future. Furthermore, the NAAQS are intended to be protective of the health of sensitive subpopulations, such as people with pre-existing disease (*e.g.*, cardiovascular diseases or asthma), children, and older adults. Similarly, the NAAQS are established to be protective of both short-term health effects and long-term health effects by defining the averaging time for the standards. The secondary standards are protective of wildlife, crops, vegetation and buildings.

2.2 Background Air Quality

Ambient background concentrations are added to the source impacts to obtain total concentrations, which, in turn, are compared to the NAAQS.

Background concentrations were determined from the closest available monitoring stations to the Project. The closest monitors are in Concord, Londonderry, Portsmouth, and Nashua, depending on pollutant. These locations are urban and considered to provide a conservatively high estimate of the air quality in Hudson, NH since they are more urban than Hudson. It is standard practice to use these high-quality data provided by NHDES. Short term local measurements would be of little to no value as it is important to use very high-quality data collected over many years for this type of analysis. In addition, the air modeling analysis below demonstrates the Project contributions are small fractions of the NAAQS. Any locally measured data, if taken over a number of years, would be highly unlikely to change the results of the analysis. To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the NHDES to U.S. EPA was obtained for 2016 to 2018. Data for these pollutant and averaging time combinations were obtained from NHDES staff and the U.S. EPA's AirData website. A summary of the background air quality concentrations is presented in **Table 2-2**.

Table 2-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

POLLUTANT	AVG TIME	Form	2016	2017	2018	Background (µg/m³)	NAAQS	Percent of NAAQS
SO_2 (1)(5)	1-Hr (4)	99th %	7.6	5.8	9.4	7.6	196.0	4%
	3-Hr	H2H	8.1	5.8	8.1	8.1	1300.0	1%
PM10	24-Hr	H2H	24.0	31.0	31.0	31.0	150.0	21%
PM2.5	24-Hr (4)	98th %	11.3	11.6	12.3	11.7	35.0	34%
	Annual (4)	H	5.0	4.7	4.4	4.7	12.0	39%
NO_2 (3)	1-Hr (4)	98th %	45.7	43.8	36.5	42.0	188.0	22%
	Annual	H	5.6	5.0	4.8	5.6	100.0	6%
CO (2)	1-Hr	H2H	600.5	559.2	589.0	600.5	40000.0	2%
	8-Hr	H2H	458.4	573.0	458.4	573.0	10000.0	6%

Notes:
From 2016-2018 NHDES and U.S. EPA's AirData Website
(1) SO_2 reported ppb. Converted to µg/m³ using factor of 1 ppb = 2.62 µg/m³.
(2) CO reported in ppm. Converted to µg/m³ using factor of 1 ppm = 1146 µg/m³.
(3) NO_2 reported in ppb. Converted to µg/m³ using factor of 1 ppb = 1.88 µg/m³.
(4) Background level is the average concentration of the three years.
(5) The 24-hour and Annual standards were revoked by U.S. EPA on June 22, 2010, Federal Register 75-119, p. 35520.

2.3 Hazardous Air Pollutants

Hazardous Air Pollutants (HAPs, or "regulated toxic air pollutants", or RTAPs in NH) are regulated through Section 112 of the Federal Clean Air Act. These are pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. These chemicals enter the body through inhalation, ingestion, or contact exposure. There are currently 187 Federally listed HAPS.[4]

In New Hampshire, the New Hampshire Code of Administrative Rules, Section Env-A 1400 Regulated Toxic Air Pollutants governs the analysis of RTAPs in the state. Table 1450-1 in Env-A 1450.01 lists the allowable maximum 24-hour and annual concentrations of RTAPs, and their de

4 42 U.S.C. §7401 et seq. (1990)

minimis allowable emission rates. To demonstrate compliance with the RTAPs, a source must show that they are either below de minimis, or compliant with the RTAP concentrations. The state also allows some in-stack testing to show compliance but that is not applicable here.

Local ambient air quality monitors rarely sample for HAPs. Thus, there are generally no available background concentrations like there are for criteria pollutants.

Diesel exhaust particulate matter (PM), although not a regulated hazardous air pollutant, is often a pollutant of concern from larger commercial vehicles. There are no regulatory Federal or New Hampshire air quality standards for diesel exhaust PM such as the HAPs and RTAPs discussed above. There are also no exposure limits enacted through the Federal Occupational Safety and Health Administration (OSHA). However, U.S. EPA has established a Reference Concentration (RfC) of 5 $\mu g/m^3$ over an annual period for Diesel Particulate Matter.[5] The RfC is an estimate of inhalation exposure which humans may be exposed throughout their lifetime without being likely to experience adverse non-cancer respiratory effects and is the appropriate and relevant health based safe exposure level to compare to Project associated diesel exhaust PM impacts. Also, in general, compliance with the other air quality standards, namely NO_2, PM, and CO, indicates acceptable levels of diesel exhaust particulate from a public health, safety and environmental perspective. Compliance with the PM NAAQS and levels below the RfC are also indicative that no significant odor or visual impacts should be noticed at residents. There is adequate buffer that even the occasional puff of smoke from a diesel truck while onsite either traveling or idling should be adequately diluted by the time it reaches nearby neighborhoods that it will not be noticed. These occasional puffs are not harmful as the standards are based on longer term average exposures of 24 hours and a year.

[5] U.S. EPA, "Health Assessment Document for Diesel Particulate Matter", EPA/600/8-90/057F, May 2002.

Section 3.0

Air Quality Analysis

3.0 AIR QUALITY ANALYSIS

As stated, an air quality impact analysis is performed to assess adverse pollutant impacts as a result of the Project.

The analysis was performed in two parts: assessment of impacts from stationary sources of air pollution onsite, and assessment of air pollutant emissions from Project-generated traffic both on-site and on local roadways.

3.1 Selected Pollutants

Air quality analyses generally consist of comparing Project impacts of air quality pollutants to applicable standards. Pollutants include the criteria pollutants, as described in Section 2.1, and toxic or hazardous air pollutants, as described in Section 2.3.

The sources included in the analysis consist of natural-gas fueled emergency generators and motor vehicles. Ambient air quality standards for CO are set at relatively high concentrations and in Epsilon's experience never exceeded by a project of this type. Natural gas fueled reciprocating internal combustion engines are relatively clean with respect to CO. Additionally, CO emissions from motor vehicles have dropped significantly over the past nearly 50 years, since the CO standards were enacted. However, the NAAQS for CO have not changed since 1971. New Hampshire has been in attainment of the 1-hour CO NAAQS since its inception in 1971, and in attainment of the 8-hour CO NAAQS since 1990.

With the implementation of ultra-low sulfur diesel fuel in on-road vehicles, emissions of SO_2 from motor vehicles is practically non-existent. Likewise, with natural-gas fueled sources, the emissions of SO_2 are also extremely low and so do not need to be included in this analysis based on Epsilon's experience.

For these reasons, impacts of CO and SO_2 are expected to be extremely small and insignificant, and air quality modeling of these pollutants was not performed. It can also be seen in Section 2.2 above that background levels of these pollutants are fractions of the NAAQS so that the Project impacts added to background would still be small comparted to the NAAQS. Carbon Dioxide (CO_2), although considered a greenhouse gas, is not considered a pollutant of direct health impact, and as such, there are no CO_2 health-based standards. Therefore, CO_2 is also not included in this analysis.

The two criteria pollutants included in the analysis are Nitrogen Dioxide (NO_2) and Particulate Matter (PM) as both PM_{10} and $PM_{2.5}$, representative of the two size fractions of PM in microns.

Selection of hazardous air pollutants is based on both the published emissions of such pollutants from the sources included in the analysis, as well as available standards. If a HAP was emitted, but there is no NH RTAP, then it was not analyzed as there is no relevant standard and a wide range of similar compounds are being analyzed and are representative of the impacts for this type of source.

Diesel exhaust particulate is a pollutant of concern. Analysis of diesel exhaust is included in the RTAP analysis. Diesel exhaust particulate is a subset of total particulate emissions since it does not include particulate emissions from brake or tire wear, so our analysis is more inclusive as it includes diesel exhaust, as well as particulate emissions from brake or tire wear.

Diesel Particulate exhaust emissions are based on the PM2.5 emissions rates The California Air Resource Board (CARB) states that “More than 90% of DPM is less than 1 µm in diameter (about 1/70th the diameter of a human hair), and thus is a subset of particulate matter less than 2.5 microns in diameter (PM2.5).” Thus, using PM2.5 as a surrogate for diesel particulate is not only justified, but also conservative. Use of PM10 as a surrogate for diesel particulate would be overly conservative.

3.2 General Methodology

Both analyses share several common methodologies. Model selection, several model control inputs, and meteorological data are common between the two analyses. These common elements are discussed in this section for brevity.

3.2.1 Air Quality Model Selection

The U.S. EPA’s AERMOD model (Version 19191) is used to predict concentrations from the stationary source related to the Project. AERMOD is the U.S. EPA’s preferred model for regulatory applications. The use of AERMOD provides the benefits of using the most current algorithms available for steady state dispersion modeling.

The AERMOD View graphical user interface (GUI) Version 9.9.0, created by Lakes Environmental, was used to facilitate model setup and post-processing of data. The AERMOD model is selected for this analysis because it:

- is the required U.S. EPA model for all refined regulatory analyses for receptors within 50 km of a source;
- is a refined model for facilities with multiple sources, source types, and building-induced downwash;
- uses actual representative hourly meteorological data;

- incorporates direction-specific building parameters which can be used to predict impacts within the wake region of nearby structures;

- allows the modeling of multiple sources together to predict cumulative downwind impacts, if needed;

- provides for variable emission rates (though not applicable for this evaluation);

- provides options to select multiple averaging periods between one-hour and one year (scaling factors can be applied to adjust the one-hour impact to a peak impact less than one-hour); and,

- allows the use of large Cartesian and polar receptor grids, as well as discrete receptor locations.

3.2.2 Modeling Options

Modeling was performed with all regulatory options set. Regulatory default options adopted for the model include:

- *Use stack-tip downwash (except for building downwash)*. Stack-tip downwash is an adjustment of the actual stack release height for conditions when the gas exit velocity is less than 1.5 times the wind speed. For these conditions, the effective release height is reduced a bit, based on the diameter of the stack and the wind and gas exit velocity. This option applies to point sources only, such as emergency generators.

- *Use the missing data and calms processing routines*. The model treats missing meteorological data in the same way as the calms processing routine, i.e., it sets the concentration values to zero for that hour, and calculates the short term averages according to U.S. EPA's calms policy, as set forth in the Guideline on Air Quality Models (Appendix W to 40 CFR 51).

A complete description of the AERMOD dispersion model may be found in the AERMOD User's guide[6] and the AERMOD model implementation guide.[7]

---

6 U.S. EPA, 2018: User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA-454/B-18-001. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

7 U.S. EPA, 2018: AERMOD Implementation Guide. EPA-454/B-18-003. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

3.2.3 NO_x to NO_2 Conversion

Though the NAAQS are based on NO_2 concentrations, the majority of nitrogen oxides (NO_x) emissions are in the form of nitric oxide (NO) rather than NO_2. NO_x undergoes chemical conversion with atmospheric ozone to form NO_2. U.S. EPA allows the use of the Ambient Ratio Method (ARM2). For this analysis, the ARM2 method was used with default input ratios (0.5/0.9)

3.2.4 Urban/Rural Determination

The AERMOD model is able to assign sources to a rural or urban category to allow specified urban sources to use the effects of increased surface heating under stable atmospheric conditions. The rural dispersion classification was appropriately selected based on a visual inspection of the area within a three-kilometer radius of the Project site. The area within 3 km of the site is shown in **Figure 2.**

3.2.5 Meteorological Data

Surface meteorological data is automatically sampled at various locations, primarily at airports. The data includes measurements of temperature, moisture, wind speed and direction, and other parameters all measured once every minute. Surface winds are measured at a height of generally 10 meters. The National Weather Service (NWS) operates more than 900 Automated Surface Observing System (ASOS) stations in the Unites States, while hundreds more surface observation locations are located throughout the world.

Upper air data is sampled at far fewer locations. These data are sampled using a measurement apparatus (radiosonde) tethered to a large balloon and radioed back to the ground observer. As the balloon rises, the radiosonde samples temperature and moisture. It's location in time indicates the wind speed and direction aloft. There are only 92 upper air monitoring locations in North America. Those nearest to the site are Gray, ME, Albany, NY, and Chatham, MA.

AERMOD-ready meteorological data files are provided by NHDES. NHDES dictates which meteorological data set is to be used based on the location of the Project and are used for both State-level and Federal-level air quality permitting. NHDES has processed and made these files available for consistency for all air quality modeling analyses conducted in the state. The files are a processed combination of surface and upper air meteorological data. Based on terrain, land use, and proximity, NHDES has determined which files are appropriate for air quality analyses at locations throughout the state.[8] For modeling in Hudson, NHDES requires the use of the Concord/Gray meteorological set they provide.

---

[8] New Hampshire Meteorological Zone Map 2006-2010 https://www.des.nh.gov/organization/divisions/air/pehb/apps/aqm/documents/nh-met-data-06-10.pdf

The meteorological data required to run AERMOD includes five years (2014-2018) of representative surface and upper air observations. The regional meteorology in Hudson is approximated with meteorological data collected at Concord Municipal Airport. The station is located roughly 34 miles north of the Project site and is representative of the site by NHDES. A wind rose showing the distribution of wind speed and direction is presented in **Figure 3,** Winds are generally out of the northwest and southeast, following the orientation of the Merrimack River valley in the Concord and Hudson NH areas. Over 40,000 hours of actual wind data from all directions and wind speeds were thus analyzed in the air modeling analysis and thus all meteorological conditions that any receptor in the study area may experience are included. Hourly surface data from the Concord Municipal Airport, with twice-daily upper air soundings from Gray, ME were used.

Surface data and upper air sounding data have been processed into AERMOD-ready input files using version 19191 of AERMET. Based on a review of the files, the U-star adjustment was used. Raw 1-minute data were included to reduce the incidence of "calm" winds. A 0.5 m/s threshold was input.

A base elevation of 339 feet was input, representative of the Concord ASOS station site. The base elevation input adjusts the wind speeds at the meteorological site to the elevation of the Project site within the AERMOD model.

Testing of this data found that the five-year period of 43,824 total hours, 245 calm hours (0.55%) were identified, and 399 (0.91%) missing hours were identified. Thus, these data should be deemed complete and representative for air quality modeling of the Project site.

3.2.6 Terrain Effects

Source and receptor terrain elevations were included in the analysis, as is required for regulatory refined modeling. One-third arc-second terrain data were obtained from the U.S.G.S. National Map Seamless Server according to guidance set forth by U.S. EPA.[9] Source, building, and receptor elevations were processed using the AERMAP (version 18081) processor by way of the Lakes AERMOD View interface.

3.2.6 Receptors

A total of 1,711 receptors were modeled in the mobile source analysis. A uniform cartesian grid encompassing 15 square kilometers and extending 3 kilometers east and west and 5 km north and south was overlaid on the area. Receptors are spaced 100 meters apart and extend well into the residential areas closest to the main arterial roadways. There are 144 receptors placed at

[9] U.S. EPA, 2018: AERMOD Implementation Guide. EPA-454/B-18-003. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

individual homes located to the south and east of the facility. Receptors were placed along the property boundary spaced at 50-meter intervals and receptors within the property were removed. Since vehicle exhaust is relatively low temperature, and has no initial vertical momentum, the highest impacts are expected close to the roadways. Receptor locations used in the analysis are shown in **Figure 4.**

3.2.7 RTAP Methodology

RTAP modeling was conducted using the Lakes AERMOD View multi-pollutant processing routines. The software automatically creates the unit emission AERMOD inputs for each source, and postprocesses the results at the completion of the AERMOD runs to calculate pollutant-specific concentrations. The postprocessing consists of multiplying the normalized concentrations produced with a unit emission rate by pollutant specific emission rates for each source, then summing the concentrations at each receptor for each modeled hour. Lastly, concentrations in the form of the RTAP standards are calculated for regulatory comparison.

Epsilon did not create or modify any of the Lakes software for this project.

3.3 Source Specific Data

3.3.1 Stationary Sources

Stationary sources of air pollutant emissions at the facility include only 3 natural gas-fired emergency generators, including one generator serving each of the three proposed buildings. There are no other significant fossil-fuel combusting sources to be located there. In this section, the inputs to the air dispersion model are provided. Each emergency generator engine has a stack from which emissions are exhausted and those emissions are quantified and the stack parameters such as diameter, height, exhaust velocity and temperature are determined as inputs to the model. The model then disperses the emissions based on the stack plume rise as it gets moved by the wind. The emission rates are determined based on emission limits established by U.S. EPA or by emission factors for gas fired engines provided by U.S. EPA.

3.3.1.1 Emissions and Source Parameters

The emergency generators are rated at 625 kW electrical output at full standby load. Each generator will be a Generac SG625 turbocharged V-12, 4-stroke-cycle lean-burn engine rated at 941 horsepower at full standby and certified to meet U.S. EPA's New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines (40 CFR 60, Subpart JJJJ). These engines are limited to 4 g/bhp-hr of carbon monoxide (CO), 2.0 g/bhp-hr of oxides of nitrogen (NO_X), and 1.0 g/bhp-hr of volatile organic compounds (VOC).

The modeled ID corresponding to the source is shown in **Table 3-1**. Physical stack height and diameter were obtained via discussions with the client and are presented in **Table 3-2**.

Table 3-1 Modeled Source Descriptions

ID	Description	Output Power Rating
STCK1-STCK3	Generac SG625	625 ekW

Table 3-2 Source Stack Physical Data

Source ID	UTME [m]	UTMN [m]	Base Elevation [m]	Release Height [m]	Gas Exit Temperature [K]	Gas Exit Velocity [m/s]	Inside Diameter [m]
STCK1	300665	4732073	41.51	3.96	875.4	59.231	0.203
STCK2	300703	4732832	39.81	3.96	875.4	59.231	0.203
STCK3	300780	4732206	45.02	3.96	875.4	59.231	0.203

Emissions data were obtained from manufacturer data sheets, emission limits, and U.S. EPA's Compilation of Air Pollutant Emission Factors (AP-42). A summary of source parameter calculations including modeled emission rates is included in Attachment A.

A comparison of the manufacturer published and NSPS emission rates is presented in **Table 3-3**.

Table 3-3 Emission Rate Comparison

Pollutant	Manufacturer Emission Rate[1] (g/hp-hr)	NSPS Emission Rate[2] (g/hp-hr)
NO_x	0.01	2.0
CO	0.22	4.0
$PM_{10}/PM_{2.5}$	N/A	N/A
[1] Generac Power Systems Part No. A0000527588 [2] 40 CFR 60, Subpart JJJJ		

As shown above, the manufacturer emission rate is significantly lower that the allowed NSPS emission rate. In this case, to be conservative, the higher of the regulatory value or the manufacturer value was used.

Emergency engines are limited to 500 hours per year, with up to 100 of those hours for non-maintenance and readiness testing.

For modeling purposes, the limit of 500 hours can be used to account for the intermittent operation of these units. A factor of 0.0571 (500/8760) was used in the calculation of an annual average emission rate to account for this limitation. U.S. EPA also allows the use of this factor in the calculation of the 1-hour NO_2 concentration, considering the probabilistic form of the 1-hour NO_2 standard, and the intermittent nature of emergency generator operation. In its March 1, 2011 memo, U.S. EPA states:[10]

> "Another approach that may be considered in cases where there is more uncertainty regarding the applicability of this guidance would be to model impacts from intermittent emissions based on an average hourly rate, rather than the maximum hourly emission. For example, if a proposed permit includes a limit of 500 hours/year or less for an emergency generator, a modeling analysis could be based on assuming continuous operation at the average hourly rate, i.e., the maximum hourly rate times 500/8760. This approach would account for potential worst-case meteorological conditions associated with emergency generator emissions by assuming continuous operation, while use of the average hourly emission represents a simple approach to account for the probability of the emergency generator actually operating for a given hour. Also note that the contribution of intermittent emissions to annual impacts should continue to be addressed as in the past to demonstrate compliance with the annual NO_2 standard."

Given U.S. EPA's stance on modeling intermittent sources with respect to the 1-hour NO_2 standard and the example provided by U.S. EPA specifically citing emergency generators, the use of the annual average hourly emission rate based on the Federal limit of 500 hours per year is applicable for this Project and is used in the modeling analysis.

The modeled criteria pollutant emission rates are presented in **Table 3-4**.

Table 3-4 Emergency Generator Criteria Pollutant Emission Rates

Source ID	STCK1-STCK3 (each)	
Pollutant	Short Term (g/s)	Annual (g/s)
NOx (as NO_2)	0.0298	0.0298
PM10/PM2.5	6.22E-05	3.55E-06
Source: 40 CFR 60 Subpart IIII, and AP-42		

The modeled hazardous air pollutant emission rates are presented in **Table 3-5**.

10 EPA Clarification Memo, Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 ,National Ambient Air Quality Standard, March 1, 2011

Table 3-5 Emergency Generator Hazardous Air Pollutant Emission Rates

Source ID	STCK1-STCK3 (each)	
Pollutant	Short Term (g/s)	Annual (g/s)
1,1,2,2-Tetrachloroethane	3.23E-05	1.84E-06
1,1,2-Trichloroethane	2.57E-05	1.47E-06
1,3-Butadiene	2.16E-04	1.23E-05
1,3-Dichloropropene	2.13E-05	1.22E-06
2-Methylnaphthalene	2.68E-05	1.53E-06
2,2,4-Trimethylpentane	2.02E-04	1.15E-05
Acenaphthene	1.01E-06	5.76E-08
Acenaphthylene	4.46E-06	2.55E-07
Acetaldehyde	6.75E-03	3.85E-04
Acrolein	4.15E-03	2.37E-04
Benzene	3.55E-04	2.03E-05
Benzo(b)fluoranthene	1.34E-07	7.65E-09
Benzo(e)pyrene	3.35E-07	1.91E-08
Benzo(g,h,i)perylene	3.34E-07	1.91E-08
Biphenyl	1.71E-04	9.77E-06
Carbon Tetrachloride	2.96E-05	1.69E-06
Chlorobenzene	2.45E-05	1.40E-06
Chloroform	2.30E-05	1.31E-06
Chrysene	5.59E-07	3.19E-08
Ethylbenzene	3.21E-05	1.83E-06
Ethylene Dibromide	3.58E-05	2.04E-06
Fluoranthene	8.96E-07	5.12E-08
Fluorene	4.58E-06	2.61E-07
Formaldehyde (a)	3.96E-04	2.26E-05
Methanol	2.02E-03	1.15E-04
Methylene Chloride	1.61E-05	9.22E-07
n-Hexane	8.96E-04	5.12E-05
Naphthalene	6.01E-05	3.43E-06
PAH	2.17E-05	1.24E-06
Phenanthrene	8.40E-06	4.79E-07
Phenol	1.94E-05	1.11E-06
Pyrene	1.10E-06	6.27E-08
Styrene	1.91E-05	1.09E-06
Tetrachloroethane	2.00E-06	1.14E-07
Toluene	3.29E-04	1.88E-05

Table 3-5 Emergency Generator Hazardous Air Pollutant Emission Rates (Continued)

Source ID	STCK1-STCK3 (each)	
Pollutant	Short Term (g/s)	Annual (g/s)
Vinyl Chloride	1.20E-05	6.87E-07
Xylene	1.49E-04	8.48E-06

(a) California Air Toxics Emission Factor (CATEF) Internal Combustion Engine - Natural gas -SCC 20100202, with NSCR 4S/Rich/<650Hp

Source: AP-42

Figure 5 presents the source and receptor locations, as well as the buildings used in the GEP stack height/downwash analysis described below.

3.3.1.2 Building Downwash

AERMOD requires direction specific building parameters to adequately incorporate the aerodynamic effects of buildings on pollutant plume dispersion. The most recent version (04274) of the Building Profile Input Program with the Prime downwash algorithms (BPIP-Prime) is used to calculate these parameters. BPIP-Prime uses the stack information, as well as the height information of nearby buildings to calculate the required heights, widths, and setbacks required to account for building downwash.

The facility consists of several buildings. Given the locations of the stacks, it is probable they are subject to aerodynamic influences that would affect the dispersion of the stack exhausts. Thus, nearby buildings and the engine stacks are input into the BPIP Prime program to create direction-specific dimension inputs for the AERMOD model. Building tiers are shown in **Figure 5**.

3.3.2 Mobile Sources

Mobile sources of air pollutant emissions at the facility include tractor trailer and box delivery trucks, as well as employee vehicles. There are no other mobile sources servicing the facility.

Vehicle data were obtained from the Traffic Impact Study.[11] Data included Project-generated vehicle forecasts on local area roadways, vehicle mix data (cars, trucks), intersection analyses, and hourly and monthly variability data.

[11] Langan Engineering and Environmental Services, Inc., Traffic Impact Study for Hudson Logistics Center, 43 Steele Road, Hudson, NH., Revised September 2020

Using the U.S. EPA's Motor Vehicle Emissions Simulator (MOVES) model to estimate vehicle-generated emissions and the AERMOD model for dispersion, pollutant concentrations from Project-generated traffic in the local area are predicted.

3.3.2.1 Emissions and Source Parameters

The U.S. EPA MOVES2014b computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOVES model are based on motor vehicle operations typical of daily periods. New Hampshire's statewide annual Inspection and Maintenance (I&M) program was included, as well as the county-specific vehicle age registration distribution, meteorology, and other inputs. The inputs for MOVES for 2022 were provided by NHDES. Use of the year 2022 for mobile source emissions is relatively conservative, as vehicle emission rates tend to decrease in future years as vehicle engines become progressively cleaner.

MOVES produces emission rates of a large number of pollutants including both criteria and hazardous air pollutants. For particulates, MOVES calculates emission rates of exhaust, tire wear, and brake wear separately[12]. In this analysis, diesel exhaust particulate is analyzed separately from total PM10 or PM2.5 as the particulate attributable exhaust is of more health concern than that of tire and brake wear. Exhaust particulate is often comprised of other chemical compounds, in addition to the actual soot particles, to which these compounds adhere. These compounds are analyzed separately as well and compared to their applicable RTAP thresholds.

Section J.3 of Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas – Appendices discusses how to characterize mobile emission sources in AERMOD. [13]

Individual roadway link and intersection emissions are presented as Attachment B.

3.3.2.1.1 Roadways

Roadway emissions were broken down by link. The traffic study also included links on which there would be local traffic, but no Project-generated traffic. To identify only traffic impacts associated

[12] Dust from roads was not included as all of the roads are paved and the vehicles are clean. Typically dust from roads is analyzed if they are unpaved or there is potential for spillage from trucks carrying solids or track out from heavy industry (such as solid waste, mining, etc). Also, dust emissions are actually typically lower from well-travelled roads such as near this site. The onsite roads are well removed from residential receptors. Road dust during construction will be minimized as indicated in Section 4.5 of this report.

[13] U.S. EPA, Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas., EPA-420-B-15-084, November 2015

with the Project, links without Project traffic were removed from the analysis. **Table 3-6** presents the roadway links included in the traffic analysis. Those 18 links found to have Project-generated traffic are denoted.

Table 3-6 Modeled Roadway Links

Link Number	Link Description	Project Traffic?
L1	River Rd., S. of Dracut/Steele	Y
L2	Steele Rd.	N
L3	Dracut Road, (River to Stuart)	Y
L4	Lowell Rd., Dracut to Rena Ave/Site Drive	Y
L5	Rena Ave.	N
L6	Site Driveway	Y
L7	Lowell Road, Rena/Site to Walmart/Sam's Driveway	Y
L8	Sam's Driveway	Y
L9	Walmart Driveway	N
L10	Lowell Rd, Walmart/Sam's to Sagamore Bridge Rd.	Y
L11	Sagamore Bridge Rd. WB	Y
L12	Sagamore Bridge Rd. EB	Y
L13	Lowell Rd., Sagamore Bridge Rd. to Flagstone/Wason	Y
L14	Flagstone Dr.	N
L15	Watson Rd.	N
L16	Lowell Rd., Wason/Flagstone to Oblate/Hampshire	Y
L17	Hampshire Dr.	N
L18	Oblate Dr.	N
L19	Lowell Rd., Oblate/Hampshire to Executive Dr.	Y
L20	Executive Dr., W. of Lowell	N
L21	Executive Dr., E. of Lowell	N
L22	Lowell Rd., Executive to Nottingham Sq., Fox Hollow	Y
L23	Fox Hollow	N
L24	Nottingham Sq.	N
L25	Lowell Rd, Fox/Nottingham to Pelham Rd.	Y
L26	Pelham Rd.	N
L27	Lowell Rd, N. of Pelham Rd.	Y
L28	Building A Road	Y
L29	Building B Road	Y
L30	Building C Road	Y

For each link, the link length, peak hour vehicles, and vehicle speed are needed in MOVES to estimate total vehicle emissions for various pollutants along the roadway.

In AERMOD, roadway sources were modeled as a series of volume sources. The use of volume sources allows the characterization of vehicular emissions to account for the initial turbulence created by moving vehicles. This initial plume spread is directly input into the AERMOD model.

For the roadway links, initial lateral plume spread is determined by the roadway width and varies by roadway. Road widths were measured in Google Earth and initial lateral spread values were calculated using width / 2.15 as described in the guidance referenced above. Estimating a vehicle height of about 3.6 m produces an initial vertical spread of about 1.67 m. The release height was set to a weighted average of vehicle heights, or 1.8 m.

3.3.2.1.2 Intersections

The traffic analysis included analysis of 9 local intersections. All 9 contained Project-related traffic and were included in the air quality impact analysis. **Table 3-7** presents the intersections included in the transportation analysis and analyzed for air quality impacts.

Table 3-7 Modeled Intersections

Source ID	Intersection
VOL1	1: River Road (Route 3A)/Lowell Road (Route 3A) & Dracut Road & Steele Road
VOL2	2: Lowell Road (Route 3A) & Site Driveway/Rena Avenue
VOL3	3: Lowell Road (Route 3A) & Sam's Club Driveway/Walmart Driveway
VOL4	4: Lowell Road (Route 3A) & Sagamore Bridge Road
VOL5	5: Lowell Road (Route 3A) & Flagstone Drive/Wason Road
VOL6	6: Lowell Road (Route 3A) & Hampshire Drive/Oblate Drive
VOL7	7: Lowell Road (Route 3A) & Executive Drive
VOL8	8: Lowell Road (Route 3A) & Fox Hollow Drive/Nottingham Square Driveway
VOL9	9: Lowell Road (Route 3A) & Pelham Road

Emissions from vehicles idling at intersections are calculated using 0 mph emission factors obtained from MOVES. The factors, along with the vehicle volumes and average delay times provide the basis of the emissions calculation at each intersection.

For the intersection sources, vehicles are not moving, so no initial mixing and growth of volume sources was assumed. The release height was set to the weighted average of vehicle heights (2.1m). Intersection initial lateral spreads were based on visual inspections of the intersection size and vary by intersection.

3.3.2.1.3 Property Parking Areas

Each of the three onsite buildings (Buildings A, B, and C) were included in the analysis to account for exhaust from idling trucks. Emissions were calculated based on projected hourly truck movements in each area. New Hampshire has regulations pertaining to vehicle idling which allow for a certain idling time based on ambient temperature, limited to 5 minutes when the ambient is above 32°F and 15 minutes down to -10°F. It's conservatively assumed that each vehicle idles for approximate 15 minutes (900 seconds) within a lot, regardless of ambient temperature.

These sources were modeled as area sources, given their general shape and orientation. It is assumed as mostly heavy-duty trucks. The conformity guidance states to assume a 4-meter release height and to assume 3.2 meters for the initial vertical spread.

Table 3-8 Modeled Parking Lots

Source ID	Building	Lot Area (m^2)	Average Peak Delay time (s/veh)	Peak Truck Traffic Volume (vph)
LOTA	Building A	60875.8	900.00	20
LOTB	Building B	34974.2	900.00	26
LOTC	Building C	54773.4	900.00	13

U.S. EPA has provided guidance on using AERMOD when modeling roadway sources.[14] The methods shown in this guidance were used in the calculation of initial plume heights, initial plume widths, and release heights. For intersections, the initial widths were estimated from the estimated size of the intersections.

Mobile sources as represented in the model are shown in **Figure 6**. Specific model inputs for mobile sources can be found in Attachment B.

3.3.2.2 Building Downwash

Volume sources are not subject to building downwash in AERMOD. Additionally, the motion of vehicles creating their own turbulent wake precludes the use of point sources (which are the only source type subject to building downwash in AERMOD) in the analysis. Therefore, building influences on mobile source emissions are not included.

[14] U.S. EPA, Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas., EPA-420-B-15-084, November 2015

3.3.2.3 Temporal Variations

Based on the traffic analysis, it is expected that the peak month will be January and the peak hour will be 11AM. All roadway traffic is adjusted based on a monthly and hourly factor to account for variability from the peak values provided.

Onsite lot use data was also provided. Using the same methodology, factors for these sources were also calculated to account for the variability from the peak values.

The factors are presented in Attachment C.

Section 4.0

Results and Conclusions

4.0 RESULTS AND CONCLUSIONS

Determining the impact of a project on air quality in the area is usually determined by comparing modeled pollutant concentrations to applicable standards.

4.1 Criteria Pollutant Results

4.1.1 Stationary Sources

The results of the stationary source modeling using AERMOD are presented in **Table 4-1**.

The results conclude that the highest concentration (as a percentage of applicable NAAQS) is for annual PM2.5 at 39% of the allowable standard when added to background concentrations. The maximum modeled concentration from the Project itself is negligible at <0.1% of the NAAQS.. The appropriate form of the annual $PM_{2.5}$ standard is annual mean averaged over 3 years. U.S. EPA guidance dictates the use of a single 5-year concurrent meteorological file in lieu of using three rolling 3-year files. The highest modeled annual concentration averaged over 5 years is added to the 3-year average of the annual background concentrations.[15]

The modeled annual $PM_{2.5}$ value in the required form is less than 0.00001 $\mu g/m^3$. With a background value of 4.7 $\mu g/m^3$ added, a total concentration of 4.7 $\mu g/m^3$ is obtained for the Project, well below the annual $PM_{2.5}$ NAAQS of 12 $\mu g/m^3$ and completely attributable to the ambient background concentration.

The second highest concentration (as a percentage of applicable NAAQS) is for 24-hour $PM_{2.5}$ at 34% of the allowable standard for the Project. The appropriate form of the 24-hour $PM_{2.5}$ standard is the 3-year average of the 98^{th} percentile 24-hour average concentrations. U.S. EPA guidance dictates the use of a single 5-year concurrent meteorological file in lieu of using three rolling 3-year files. The highest modeled 24-hour concentration averaged over 5 years is added to the 3-year average of the 98^{th} percentile 24-hour background concentrations.[16]

The modeled 24-hour $PM_{2.5}$ value in the required form is 0.00001 $\mu g/m^3$. With a background value of 11.7 $\mu g/m^3$ added, a total concentration of 11.7 $\mu g/m^3$ is obtained for the Project, well below the 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$. The Project's contribution to this value is essentially zero, whereby the entire value is attributable to the monitored ambient background concentration.

---

15 U.S. EPA, 2010; Memorandum - Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 23, 2010.

16 U.S. EPA, 2010; Memorandum - Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 23, 2010.

The third highest concentration (as a percentage of applicable NAAQS) is for 1-hour NO_2 at 26% of the standard for the Project. The appropriate form of the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations. U.S. EPA guidance dictates the use of a single 5-year concurrent meteorological file in lieu of using three rolling 3-year files. The highest-eighth-highest modeled maximum daily 1-hour concentration averaged over 5 years is added to the highest background concentration over the most recent 3 years to show compliance with the standard.[17]

The modeled 1-hour NO_2 value in the required form is 7.1 µg/m³. With a background value of 42.0 µg/m³ added, a total concentration of 49.1 µg/m³ is obtained for the Project, well below the 1-hour NO_2 NAAQS of 188 µg/m³.

4.1.2 Mobile Sources

The results of the mobile source criteria pollutant impact analysis using AERMOD are presented in **Table 4-2**.

The highest concentration (as a percentage of applicable NAAQS) is for 1-hour NO_2 at 45% of the standard. The modeled 1-hour NO_2 value in the required form is 43.5 µg/m³. With a background value of 42.0 µg/m³ added, a total concentration of 85.5 µg/m³ is obtained for the Project, well below the 1-hour NO_2 NAAQS of 188 µg/m³.

The second highest concentration (as a percentage of applicable NAAQS) is for annual $PM_{2.5}$ at 41% of the standard. The modeled annual $PM_{2.5}$ value in the required form is 0.23 µg/m³. With a background value of 4.7 µg/m³ added, a total concentration of 4.9 µg/m³ is obtained for the Project, well below the annual $PM_{2.5}$ NAAQS of 12 µg/m³ and mostly completely attributable to the ambient background concentration.

The highest concentrations are generally found immediately along the roads and tend to decrease rapidly with distance from the roadways. Thus, concentrations at nearby residential areas are well under the standards. All other pollutant concentrations are below applicable NAAQS as well.

4.1.3 Overall

The overall results of the criteria pollutants are not significantly different than those for the stationary or mobile sources, as the two sources do not really interact all that much. That is, the highest impacts from the mobile sources are typically not in areas where the highest impacts from the stationary sources are found.

---

[17] U.S. EPA, 2011; Memorandum - Additional Clarification Regarding Application of Appendix W Modeling Guidance for the NO_2 National Ambient Air Quality Standard. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 1, 2011.

For all sources, the highest concentration (as a percentage of applicable NAAQS) is for 1-hour NO_2 at 46% of the standard for the Project. The modeled 1-hour NO_2 value in the required form is 44.9 μg/m³. With a background value of 42.0 μg/m³ added, a total concentration of 86.9 μg/m³ is obtained for the Project, well below the 1-hour NO_2 NAAQS of 188 μg/m³. **Table 4-3** presents the combined results of stationary and mobile sources.

4.2 RTAP Results

4.2.1 Stationary Sources

Since the three emergency generators are powered by clean burning natural gas, emissions of hazardous air pollutants are well below corresponding standards. Short-term results are based on continuous use of the engines for 24-hours. Annual results are based on the federal operating limit of 500 hours per year. The results of the stationary source hazardous air pollutant analysis are presented in **Table 4-4.**

In general, all RTAP pollutant concentrations are well below their corresponding standards. Acrolein is the most prevalent emitted RTAP and local concentrations are still only 36% of the standard.

Outside of emergency use during power loss, the generators are expected to be tested regularly, typically weekly or monthly, for less than one hour. Therefore, the assumption of continuous use for 24-hours is extremely conservative. Even in area power-loss situations, grid power is typically restored within 24 hours., however 24 hours was modeled.

There are obviously no diesel exhaust particulate emissions from natural gas reciprocating engines.

4.2.2 Mobile Sources

The results of the mobile source hazardous air pollutant impact analysis using AERMOD are presented in **Table 4-5.**

All modeled concentrations are well below their applicable RTAP standards. The highest modeled concentration (as a percentage of the standard) is for acrolein. All other compounds (including formaldehyde benzene, naphthalene, acetaldehyde, butadiene, and arsenic compounds) are all below 10% of their standards for the Project.

U.S. EPA developed the diesel exhaust particulate RfC of 5 μg/m³ to be protective of a lifetime of continuous exposure. The RfC is defined as "an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime".[18]

The maximum predicted annual diesel exhaust concentration of 0.24 $\mu g/m^3$ is roughly 5% of the RfC. Therefore, impacts of diesel exhaust are minimal.

Again, the highest concentrations are generally found immediately along the roads and tend to decrease rapidly with distance from the roadways. Thus, concentrations at nearby residential areas are well under the standards.

4.3 Mitigation

New Hampshire regulation ENV-A-1100 regulates idling of vehicles to reduce the air pollutants emitted from unnecessary idling. The time vehicles may be idling is a function of the outside temperature:

- At temperatures above 32°F, idling is limited to 5 minutes;
- At temperatures between -10°F and 32°F, idling is limited to 15 minutes;
- At temperatures below -10°F, there is no limit on idling time.

Vehicles in traffic, emergency vehicles, vehicles providing power take-off (PTO) for refrigeration or lift gate pumps, and vehicles supplying heat or air conditioning for passenger comfort during transportation are generally exempt from this regulation.

The facility is expected to enforce the NH vehicle idling regulations and to reduce the occurrence and duration of idling vehicles onsite to ensure compliance with these standards.

To mitigate impacts from the emergency engine backup power generator stationary sources on the property, cleaner natural gas fueled engines were chosen over diesel engines. Additionally, operations for testing and maintenance should be performed during times when the atmosphere is more unstable and has better mixing, leading to better dispersion of pollutants. These hours are typically mid-afternoon when the ground has been effectively heated by the midday sun.

4.4 Air Quality Permits

For the backup power emergency generators, according to ENV-A-610, a General State Permit (GSP) for Internal Combustion Engines – Emergency Generators or Fire Pump Engines is required

[18] U.S. EPA. 2003. "IRIS Chemical Assessment Summary for Diesel engine exhaust (CAS No. N.A.)." 36p., February 28. Accessed on June 15, 2020 at https://www.epa.gov/iris

for each unit to be included within each of the three proposed buildings. No pollution control equipment is required, provided that the emissions from the units meet all applicable federal standards for non-road engines. No other air quality permits are expected to be required.

No air quality permits are required for transportation other than the vehicle registration, inspection, and maintenance requirements set forth by the U.S. Department of Transportation and the New Hampshire Department of Transportation.

4.5 Construction

Short-term air quality impacts from fugitive dust may be expected during excavation and the early phases of construction. Plans for controlling fugitive dust during excavation and construction include mechanical street sweeping, wetting and/or misting portions of the site during periods of high wind, and careful removal of debris by covered trucks. The construction contract will provide for several strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts. These measures are expected to include:

- Using wetting agents on area of exposed soil on a scheduled basis;
- Using covered trucks;
- Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Minimizing storage of debris on the site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.
- Limit maximum travel speeds on unpaved areas; and
- Provide wheel wash stations to limit trackout of soil during the excavation phase.

These measures will also be factored into the Stormwater Pollution Prevention Plan required to be implemented under the U.S. EPA NPDES Construction General Permit Program.

New Hampshire regulation ENV-A-1100 requires that vehicles idle for no more than five minutes when temperatures are above 32°F. To reduce engine idling, the selected contractor(s) will be notified of the New Hampshire anti-idling regulations.

Construction equipment engines will comply with requirements for the use of ultra-low sulfur diesel (ULSD) in off-road engines. The construction contractor will be encouraged to use diesel construction equipment with installed exhaust emission controls such as oxidation catalysts or particulate filters on their diesel engines.

In addition to the items listed above, all trucks leaving the site must have all dirt/mud removed from the wheels and undercarriage of the truck prior to leaving the site. In addition, any loads containing soil for off-site disposal will be covered. Construction vehicles and equipment will not be permitted to be washed in the streets outside of the Project site. Excess water from the wheel wash stations will be managed and catch basins in the surrounding street will be protected from potential runoff from the cleaning operations.

The Proponent acknowledges the importance of emission controls and will encourage contractors to use proper emission controls, use of clean fuels, control of truck and equipment idling times, and conducting operations without affect to neighbors' clean air are all important priorities to the Proponent.

4.6 Other Potential Impacts

We also understand a number of concerns over the potential for air quality impacts have been raised by the public through the Town's Planning Board review process, and based upon our analysis above, and conclusions described below, we note the following:

4.6.1 Distance Between Proposed Project Buildings and Existing Residential Dwellings.

Based upon the analysis above which demonstrates that both stationary and mobile sources of potential pollutants are expected to be well below applicable federal and state standards, there does not appear to be a need, from an air quality or health and safety or environmental perspective, to provide any specific setback or buffer between the proposed buildings on the Project site and abutting residential dwellings for purposes of air pollution control. We understand, however, that a 200-foot setback from the residential property boundary is required under the Hudson Zoning Ordinance and that the Proponent has provided a much greater setback than what the Hudson Zoning Ordinance requires.

4.6.2 Diesel Emissions and Particulates.

Based upon the analysis above which demonstrates that both stationary and mobile sources of potential pollutants are expected to be well below applicable federal and state standards, the Project's diesel emissions including particulates from exhaust, tire wear, and brake wear, are not expected to cause or exacerbate health conditions, such as asthma, for those persons living in nearby residential dwellings.

4.6.3 Compliance with Air Quality Standards.

As demonstrated in the analysis above which demonstrates that both stationary and mobile sources of potential pollutants are expected to be well below applicable federal and state standards, the characterization of Project emissions as creating a mushroom cloud of toxic emissions over the site with poisonous or cancerous plumes is simply incorrect and not based upon fact.

4.6.4 Truck Idling.

As noted above, New Hampshire regulation ENV-A-1100 regulates idling of vehicles to reduce the air pollutants emitted from unnecessary idling, and we have advised the Proponent concerning measures to be undertaken to ensure compliance with these idling requirements both during construction and post-construction operations.

4.7 Conclusions

The NAAQS and RTAP standards are designed to protect public health and welfare. Since all predicted concentrations are below their applicable NAAQS and/or RTAP standards, it can be concluded that the proposed Project will not cause or contribute to a condition of air pollution in the area. Therefore, with respect to air quality impacts, the Project meets the requirements laid out in Chapter 275 of the Town of Hudson's Site Plan Review regulations.

Table 4-1 Stationary Source NAAQS Results

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONC. (µg/m³)	BACKGROUND CONCENTRATION (µg/m³)	TOTAL CONCENTRATION [6] (µg/m³)	STANDARD (µg/m³)	% of Standard
PM_{10}	24 HOUR [2]	<0.01	31.0	31.0	150	21%
$PM_{2.5}$	24 HOUR [3]	<0.01	11.7	11.7	35	34%
	ANNUAL [4]	<0.01	4.7	4.7	12	39%
NO_2	1 HOUR [5]	7.12	42.0	49.1	188	26%
	ANNUAL [1]	0.31	5.6	5.9	100	6%

Notes:

[1] Highest Annual Concentration Over 5 Years

[2] Highest 6th-High Concentration Over 5 Years

[3] Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years

[4] Maximum Annual Concentration Averaged Over 5 Years

[5] Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

[6] Discrepancies in sums may occur due to rounding.

Table 4-2 Mobile Source NAAQS Results

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONC. ($\mu g/m^3$)	BACKGROUND CONCENTRATION ($\mu g/m^3$)	TOTAL CONCENTRATION [6] ($\mu g/m^3$)	STANDARD ($\mu g/m^3$)	% of Standard
PM_{10}	24 HOUR [2]	1.68	31.0	32.7	150	22%
$PM_{2.5}$	24 HOUR [3]	0.62	11.7	12.4	35	35%
	ANNUAL [4]	0.23	4.7	4.9	12	41%
NO_2	1 HOUR [5]	43.50	42.0	85.5	188	45%
	ANNUAL [1]	3.64	5.6	9.3	100	9%

Notes:

[1] Highest Annual Concentration Over 5 Years

[2] Highest 6th-High Concentration Over 5 Years

[3] Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years

[4] Maximum Annual Concentration Averaged Over 5 Years

[5] Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

[6] Discrepancies in sums may occur due to rounding.

Table 4-3 All Sources NAAQS Results

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONC. (µg/m³)	BACKGROUND CONCENTRATION (µg/m³)	TOTAL CONCENTRATION [6] (µg/m³)	STANDARD (µg/m³)	% of Standard
PM_{10}	24 HOUR [2]	1.68	31.0	32.7	150	22%
$PM_{2.5}$	24 HOUR [3]	0.62	11.7	12.4	35	35%
	ANNUAL [4]	0.23	4.7	4.9	12	41%
NO_2	1 HOUR [5]	44.87	42.0	86.9	188	46%
	ANNUAL [1]	3.70	5.6	9.3	100	9%

Notes:

[1] Highest Annual Concentration Over 5 Years

[2] Highest 6th-High Concentration Over 5 Years

[3] Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years

[4] Maximum Annual Concentration Averaged Over 5 Years

[5] Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

[6] Discrepancies in sums may occur due to rounding.

Table 4-4 Stationary Source HAP (RTAP) Results

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION ($\mu g/m^3$)	STANDARD ($\mu g/m^3$)	% of Standard
1,1,2,2-Tetrachloroethane	24 HOUR	2.28E-03	25	0%
	ANNUAL	1.21E-06	16	0%
1,1,2-Trichloroethane	24 HOUR	1.82E-03	277	0%
	ANNUAL	9.69E-07	184	0%
1,3-Butadiene	24 HOUR	1.53E-02	2	1%
	ANNUAL	8.11E-06	2	0%
1,3-Dichloropropene	24 HOUR	1.51E-03	20	0%
	ANNUAL	8.04E-07	20	0%
2,2,4-Trimethylpentane	24 HOUR	1.43E-02	NA	NA
	ANNUAL	7.58E-06	NA	NA
2-Methylnaphthalene	24 HOUR	1.89E-03	15	0%
	ANNUAL	1.01E-06	9.7	0%
Acenaphthene	24 HOUR	7.14E-05	NA	NA
	ANNUAL	3.80E-08	NA	NA
Acenaphthylene	24 HOUR	3.15E-04	NA	NA
	ANNUAL	1.68E-07	NA	NA
Acetaldehyde	24 HOUR	4.77E-01	161	0%
	ANNUAL	2.54E-04	9	0%
Acrolein	24 HOUR	2.93E-01	0.82	36%
	ANNUAL	1.56E-04	0.02	1%
Benzene	24 HOUR	2.51E-02	5.7	0%
	ANNUAL	1.34E-05	3.8	0%
Benzo(b)fluoranthene	24 HOUR	9.47E-06	0.36	0%
	ANNUAL	5.04E-09	0.24	0%
Benzo(e)pyrene	24 HOUR	2.37E-05	NA	NA
	ANNUAL	1.26E-08	NA	NA
Benzo(g,h,i)perylene	24 HOUR	2.36E-05	NA	NA
	ANNUAL	1.26E-08	NA	NA
Biphenyl	24 HOUR	1.21E-02	4.6	0%
	ANNUAL	6.44E-06	3.1	0%
Carbon Tetrachloride	24 HOUR	2.09E-03	111	0%
	ANNUAL	1.11E-06	100	0%

Table 4-4 Stationary Source HAP (RTAP) Results (Continued)

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	STANDARD (μg/m^3)	% of Standard
Chlorobenzene	24 HOUR	1.73E-03	231	0%
	ANNUAL	9.23E-07	154	0%
Chloroform	24 HOUR	1.63E-03	175	0%
	ANNUAL	8.64E-07	117	0%
Chrysene	24 HOUR	3.95E-05	0.36	0%
	ANNUAL	2.10E-08	0.24	0%
Ethyl Benzene	24 HOUR	2.27E-03	1000	0%
	ANNUAL	1.21E-06	1000	0%
Ethylene Dibromide	24 HOUR	2.53E-03	0.05	5%
	ANNUAL	1.35E-06	0.05	0%
Fluoranthene	24 HOUR	6.33E-05	NA	NA
	ANNUAL	3.38E-08	NA	NA
Fluorene	24 HOUR	3.24E-04	NA	NA
	ANNUAL	1.72E-07	NA	NA
Formaldehyde	24 HOUR	2.80E-02	1.3	2%
	ANNUAL	1.49E-05	0.88	0%
Hexane	24 HOUR	6.33E-02	885	0%
	ANNUAL	3.38E-05	700	0%
Methanol	24 HOUR	1.43E-01	20000	0%
	ANNUAL	7.58E-05	20000	0%
Methylene Chloride	24 HOUR	1.14E-03	621	0%
	ANNUAL	6.08E-07	600	0%
Naphthalene	24 HOUR	4.25E-03	186	0%
	ANNUAL	2.26E-06	3	0%
PAH	24 HOUR	1.53E-03	NA	NA
	ANNUAL	8.18E-07	NA	NA
Phenanthrene	24 HOUR	5.94E-04	0.71	0%
	ANNUAL	3.16E-07	0.48	0%
Phenol	24 HOUR	1.37E-03	68	0%
	ANNUAL	7.32E-07	45	0%
Pyrene	24 HOUR	7.78E-05	0.71	0%
	ANNUAL	4.13E-08	0.48	0%

Table 4-4 Stationary Source HAP (RTAP) Results (Continued)

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (µg/m³)	STANDARD (µg/m³)	% of Standard
Styrene	24 HOUR	1.35E-03	1000	0%
	ANNUAL	7.19E-07	1000	0%
Tetrachloroethane	24 HOUR	1.41E-04	NA	NA
	ANNUAL	7.52E-08	NA	NA
Toluene	24 HOUR	2.33E-02	5000	0%
	ANNUAL	1.24E-05	5000	0%
Vinyl Chloride	24 HOUR	8.48E-04	9.3	0%
	ANNUAL	4.53E-07	6.2	0%
Xylene	24 HOUR	1.05E-02	1550	0%
	ANNUAL	5.59E-06	100	0%

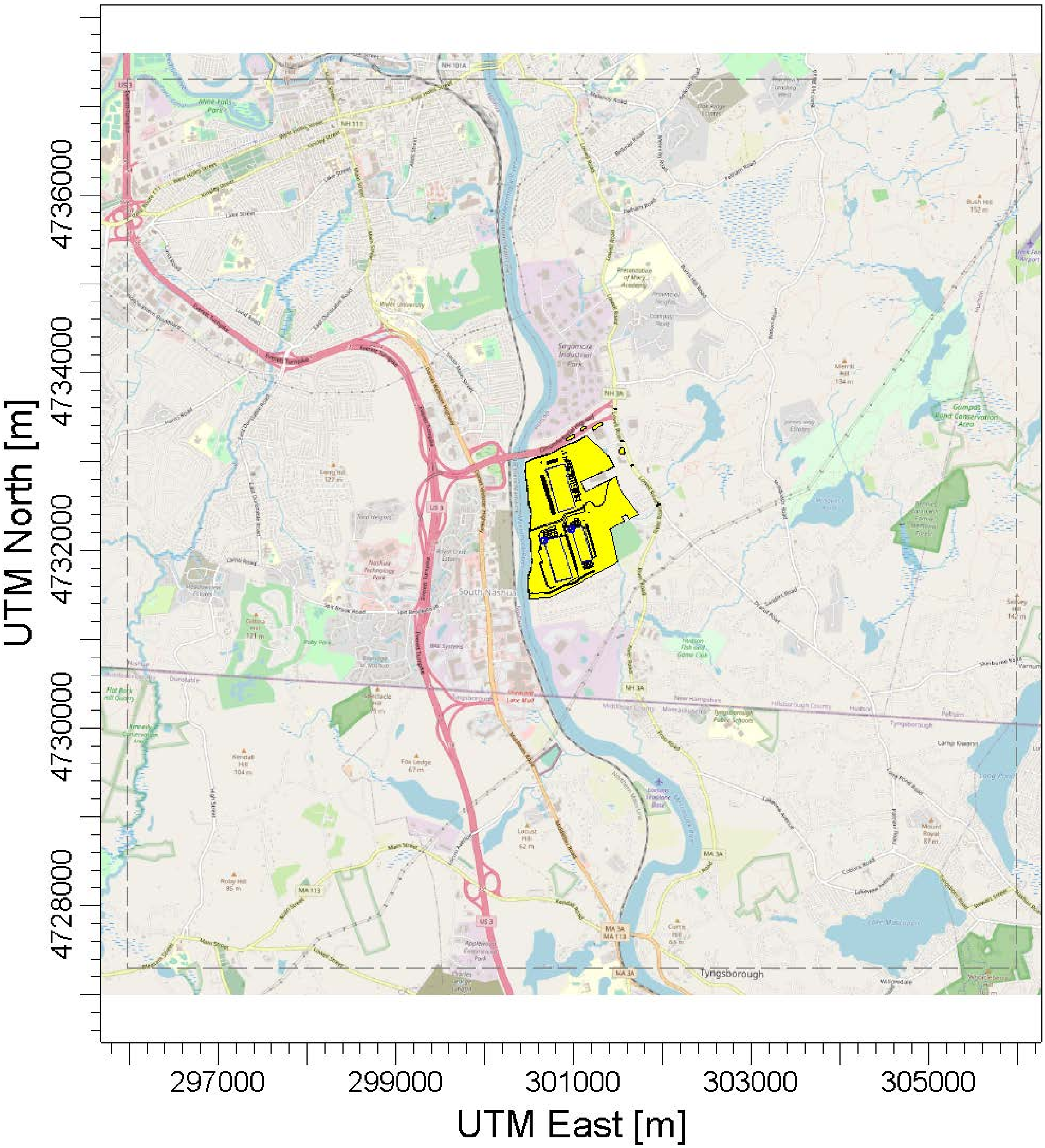
Table 4-5 Mobile Source HAP (RTAP) Results

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (µg/m3)	STANDARD (µg/m3)	% of Standard
Diesel Particulate	24 HOUR	6.94E-01	NA	NA
	ANNUAL	2.38E-01	5	5%
1,3-Dichloropropene	24 HOUR	3.95E-03	20	0%
	ANNUAL	1.36E-03	20	0%
2,2,4-Trimethylpentane	24 HOUR	4.34E-02	NA	NA
	ANNUAL	1.50E-02	NA	NA
Acenaphthene	24 HOUR	2.47E-04	NA	NA
	ANNUAL	8.47E-05	NA	NA
Acenaphthylene	24 HOUR	4.82E-04	NA	NA
	ANNUAL	1.66E-04	NA	NA
Acetaldehyde	24 HOUR	3.53E-02	161	0%
	ANNUAL	1.21E-02	9	0%
Acrolein	24 HOUR	6.11E-03	0.82	1%
	ANNUAL	2.10E-03	0.02	10%
Arsenic Compounds	24 HOUR	1.14E-03	0.036	3%
	ANNUAL	2.29E-04	0.024	1%
Benzene	24 HOUR	4.55E-02	5.7	1%
	ANNUAL	1.52E-02	3.8	0%
Benzo(b)fluoranthene	24 HOUR	4.18E-05	0.36	0%
	ANNUAL	1.44E-05	0.24	0%
Benzo(g,h,i)perylene	24 HOUR	1.07E-04	NA	NA
	ANNUAL	3.63E-05	NA	NA
Chromium 6+	24 HOUR	5.81E-06	0.036	0%
	ANNUAL	1.17E-06	0.024	0%
Chrysene	24 HOUR	1.74E-04	0.36	0%
	ANNUAL	5.10E-05	0.24	0%
Ethyl Benzene	24 HOUR	4.68E-02	1000	0%
	ANNUAL	1.61E-02	1000	0%
Fluoranthene	24 HOUR	7.56E-04	NA	NA
	ANNUAL	2.30E-04	NA	NA
Fluorene	24 HOUR	6.12E-04	NA	NA
	ANNUAL	2.01E-04	NA	NA
Formaldehyde	24 HOUR	8.38E-02	1.3	6%
	ANNUAL	2.88E-02	0.88	3%

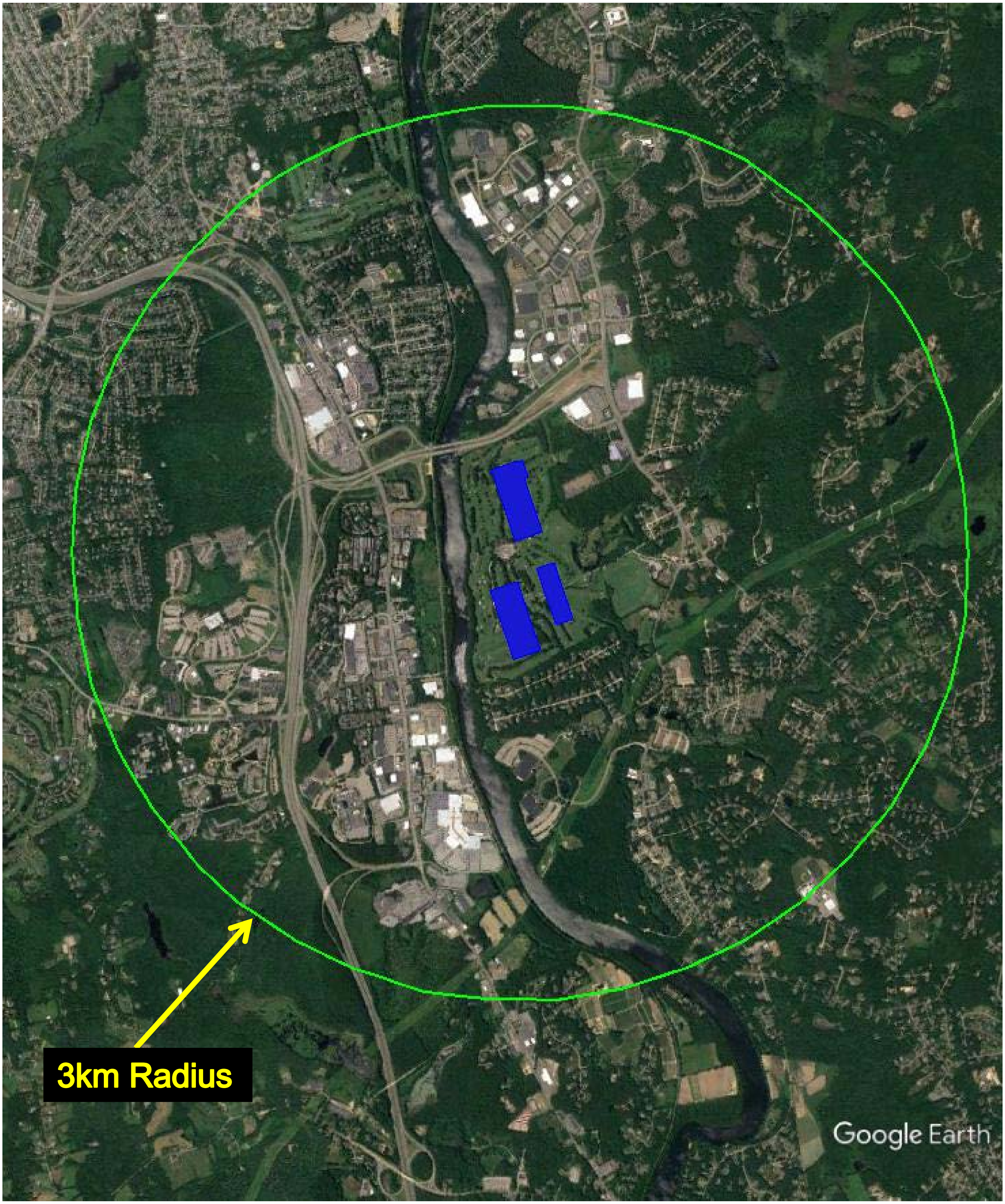
Table 4-5 Mobile Source HAP (RTAP) Results (Continued)

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (µg/m3)	STANDARD (µg/m3)	% of Standard
Hexane	24 HOUR	4.18E-02	885	0%
	ANNUAL	1.43E-02	700	0%
Manganese Compounds	24 HOUR	7.82E-04	0.1	1%
	ANNUAL	1.58E-04	0.05	0%
Naphthalene	24 HOUR	9.23E-03	186	0%
	ANNUAL	3.17E-03	3	0%
Nickel Compounds	24 HOUR	1.01E-03	3.6	0%
	ANNUAL	2.04E-04	2.4	0%
Phenanthrene	24 HOUR	1.16E-03	0.71	0%
	ANNUAL	3.83E-04	0.48	0%
Propionaldehyde	24 HOUR	4.28E-03	239	0%
	ANNUAL	1.47E-03	8	0%
Pyrene	24 HOUR	1.02E-03	0.71	0%
	ANNUAL (1)	3.06E-04	0.48	0%
Styrene	24 HOUR	1.55E-03	1000	0%
	ANNUAL	5.33E-04	1000	0%
Toluene	24 HOUR	1.89E-01	5000	0%
	ANNUAL	6.53E-02	5000	0%
Total Mercury Compounds	24 HOUR	5.10E-05	0.3	0%
	ANNUAL	1.03E-05	0.3	0%
Xylene	24 HOUR	1.52E-01	1550	0%
	ANNUAL	5.24E-02	100	0%

Figures



5843/Hudson Logistics Center



5843/Hudson Logistics Center

Figure 2
Urban/Rural 3km Radius

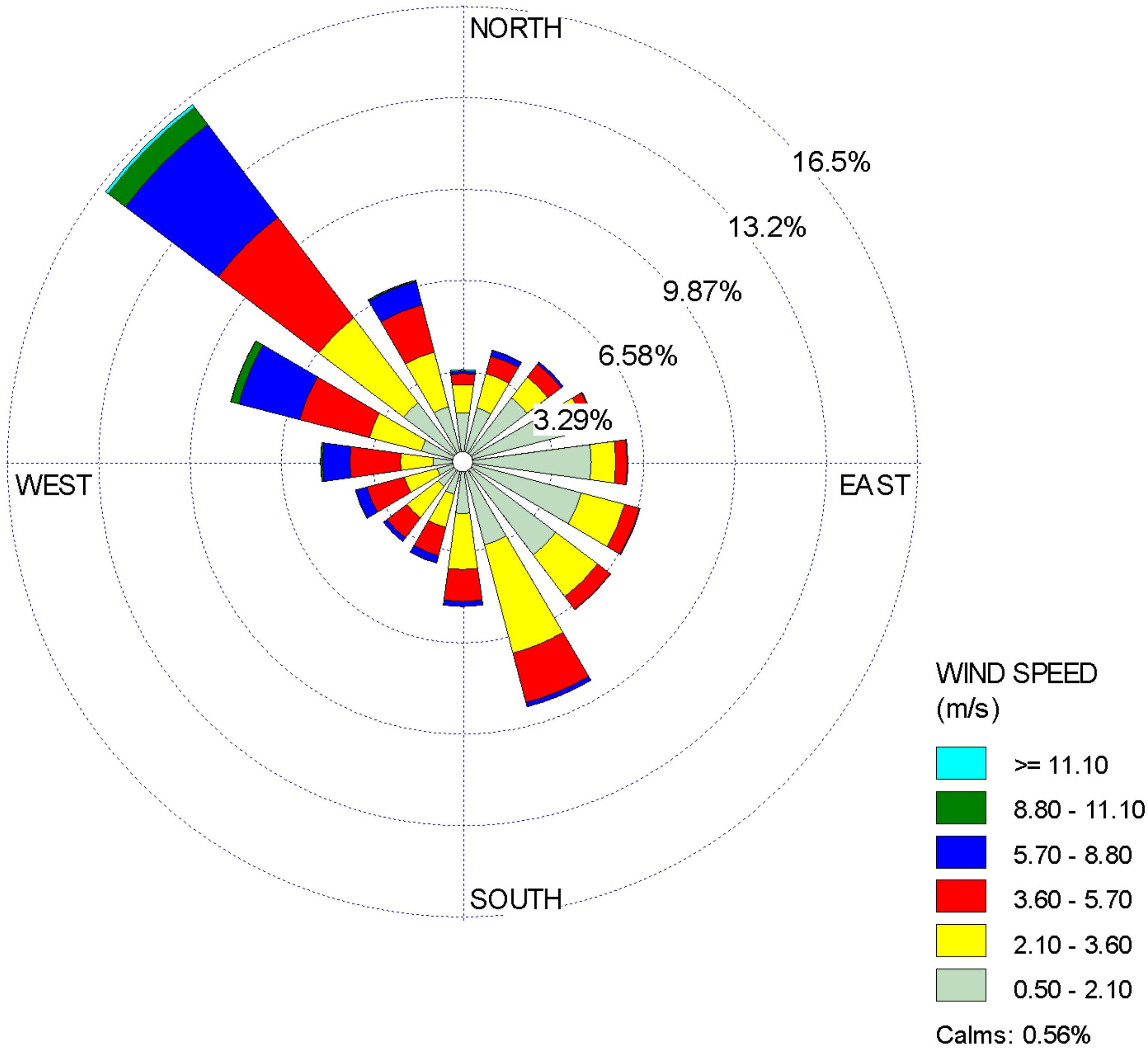


Figure 3

2014-2018 Concord (NH) Municipal Airport Wind Rose

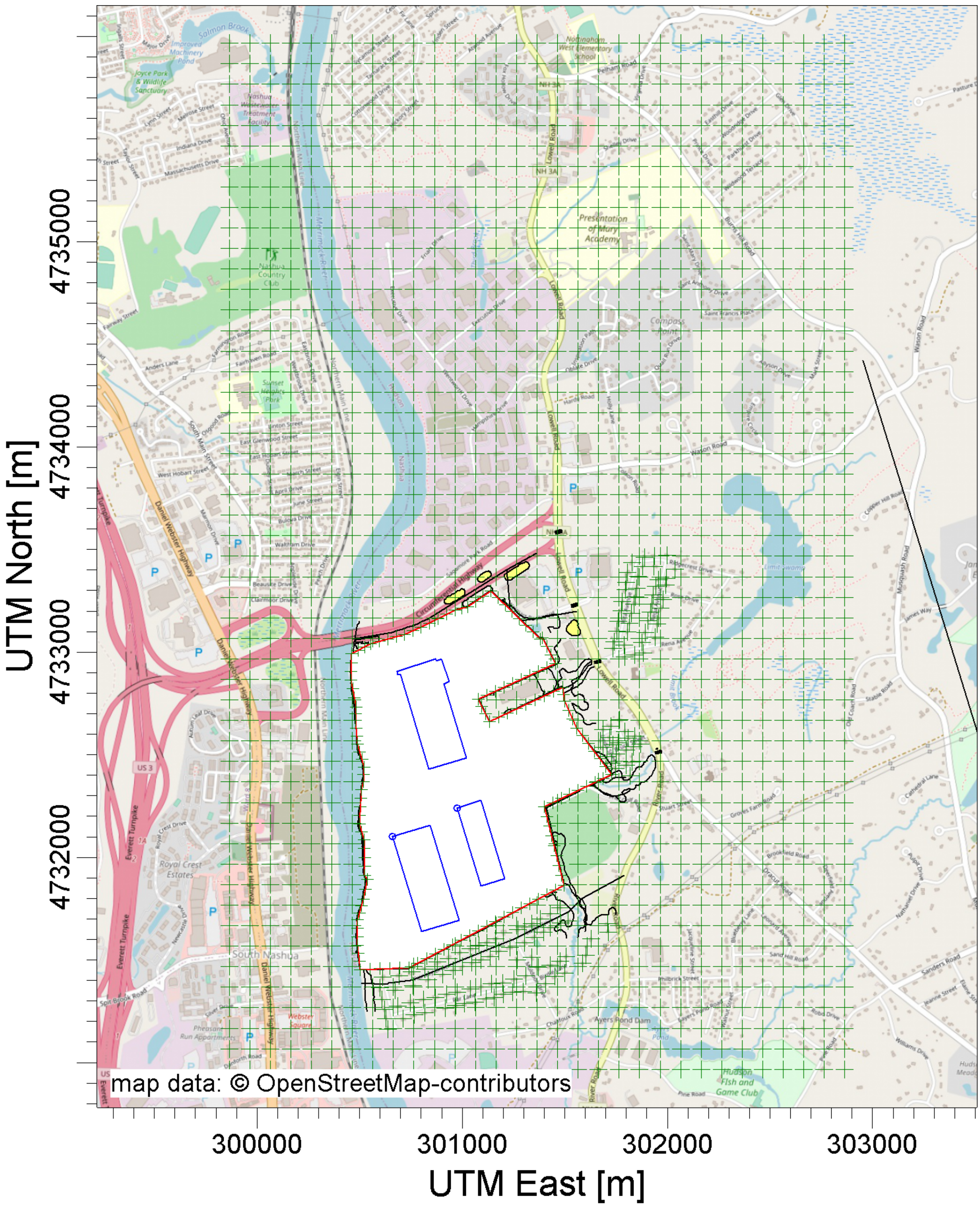
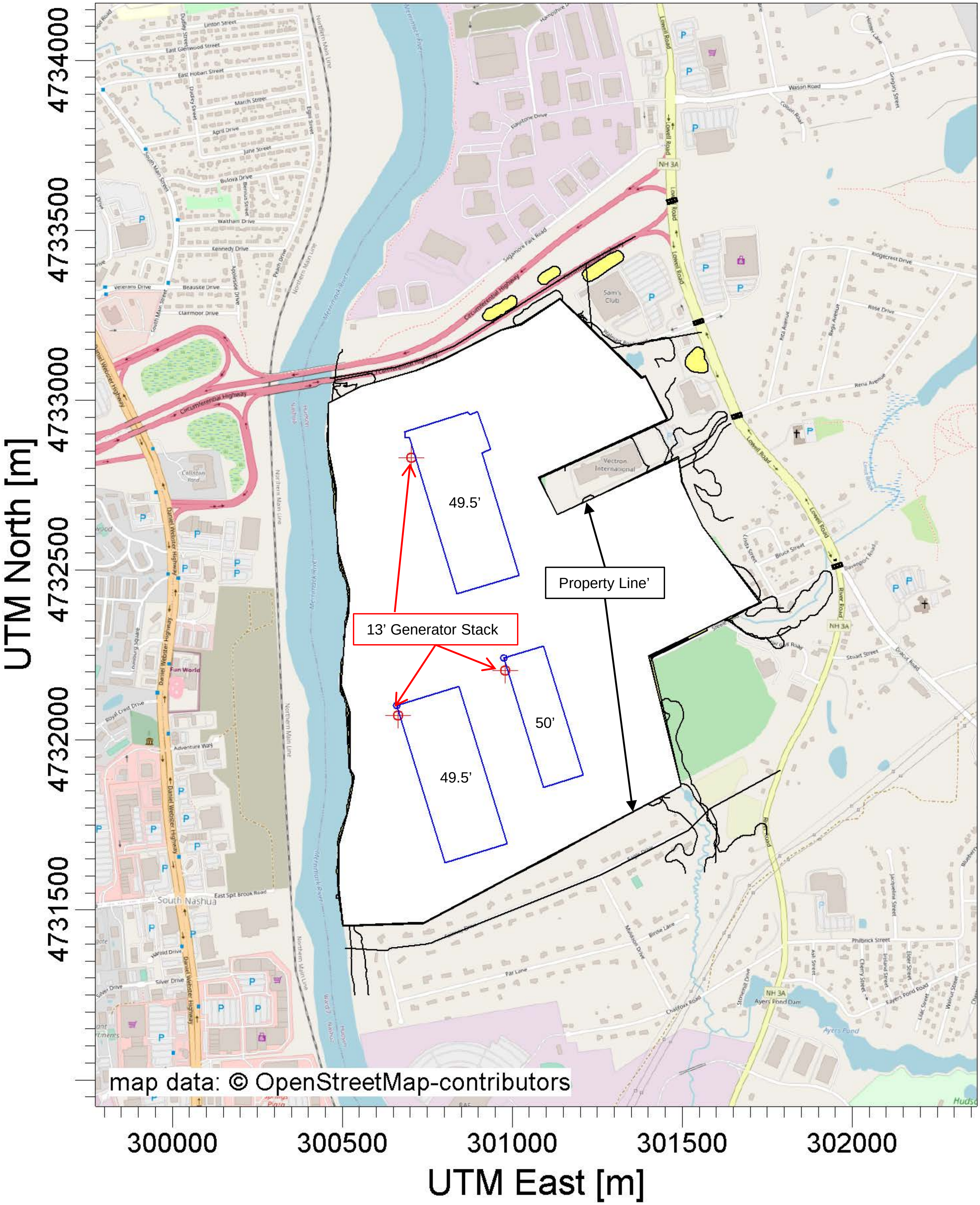


Figure 4
Receptor Locations

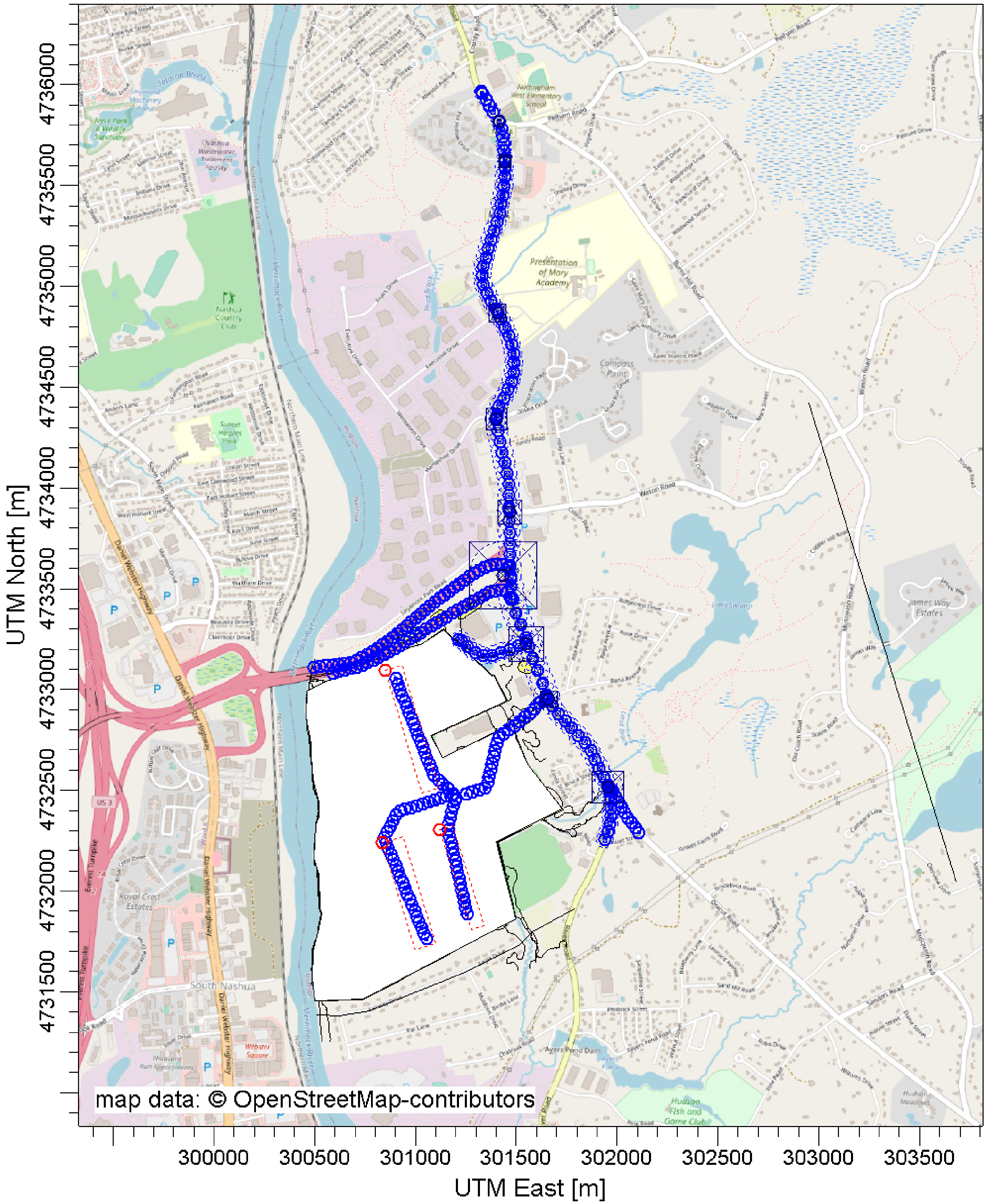


5843/Hudson Logistics Center

Epsilon ASSOCIATES INC.

Figure 5

Stationary Sources Building Locations



5843/Hudson Logistics Center

Figure 6

Mobile Source Locations

Attachment A

Stationary Source of Inputs and Overall Results

Hudson Logistics - Hudson, NH

Diesel Engines			
			Notes
Designation		EG1-3	
Number		3	
Electrical output	kilowatts	625	Spec sheet
Make		Generac	Spec sheet
model		SG625	Spec sheet
Fuel		Natural Gas	Spec sheet
Engine Horsepower	BHP	941.00	Spec sheet
Engine power	kilowatts	701.70	calculated
Fuel consumption @full load	scfh	6282.0	Spec sheet
Heat Input	MMBTU/hr:	6.40764	calculated (1020 Btu/scf)
Stack Parameters			
Exhaust Temperature	°F	1116.0	Spec sheet
Exhaust Temperature	°K	875.4	calculated
Total Exhaust Flow	ACFM	4070.0	Spec sheet
Flange Diameter	in.		
Maximum Backpressure	in. H2O	27.0	Spec sheet
Maximum velocity	fpm	17510.56	calculated
Flow area required	sq. ft	0.232	calculated
Number of exhausts (typ. 1 or 2)	#	1.0	Generac DWG I000022857
Selected silencer diameter	in	8.0	Generac DWG I000022857
Actual silencer opening area	sq. ft each	0.349	calculated
Actual velocity	fpm each	11659.691	calculated
Actual velocity	fps each	194.328	calculated
Single Stack Effective Diameter	ft	0.667	calculated
Single Stack Effective Diameter	m	0.203	calculated
Single Stack Effective Velocity	fps	194.328	calculated
Single Stack Effective Velocity	mps	59.231	calculated
Primary Building Height	ft	0.0	
Stack Height (above roofline)	ft	13.0	155.9" above pad base if ground mounted
Stack height (above ground)	ft	*12.99*	calculated
Stack Height	m	*3.96*	calculated

Pollutant	Emission factor unit	Emission factor	
NOx	g/BHP-hr	2.00	Part 60 Subpart JJJJ Table 1 limit
CO	g/BHP-hr	4.00	Part 60 Subpart JJJJ Table 1 limit
PM10	lb/MMBTU	7.71E-05	From Table 3.2-2 AP42
PM2.5	lb/MMBTU	7.71E-05	From Table 3.2-2 AP42
SO2	lb/MMBTU	5.88E-04	From Table 3.2-2 AP42
HAPs	lb/MMBTU	6.71E-02	From Table 3.2-2 AP42
CO2	lb/MMBTU	1.10E+02	From Table 3.2-2 AP42

Short Term Emission Rate			
NOx	g/s	0.0298	uses EPA intermittent factor (500 hrs/yr)
CO	g/s	1.0456	calculated
PM10	g/s	6.22E-05	calculated
PM2.5	g/s	6.22E-05	calculated
SO2	g/s	4.75E-04	calculated

Long TermEmission Rate	500	hrs/yr	
NOx	g/s	0.0298	calculated
CO	g/s	0.0597	calculated
PM10	g/s	3.55E-06	calculated
PM2.5	g/s	3.55E-06	calculated
SO2	g/s	2.71E-05	calculated

Hudson Logistics - Hudson, NH

Ambient Monitored Concentrations

POLLUTANT	AVERAGING TIME	Form	2016	2017	2018	Units	ppm/ppb to µg/m³ Conversion Factor	2016-2018 Background Concentration (µg/m³)	Location
SO_2 [1][6]	1-Hour [5]	99th %	2.9	2.2	3.6	ppb	2.62	7.6	Londonderry, NH
	3-Hour	H2H	3.1	2.2	3.1	ppb	2.62	8.1	Londonderry, NH
PM-10 [7]	24-Hour	H2H	24	31	31	µg/m³	1	31	Pierce Island, Portsmouth, NH
PM-2.5	24-Hour [5]	98th %	11.3	11.6	12.3	µg/m³	1	11.7	Londonderry, NH
	Annual [5]	H	5.0	4.7	4.4	µg/m³	1	4.7	Londonderry, NH
NO_2 [3]	1-Hour [5]	98th %	24.3	23.3	19.4	ppb	1.88	42.0	Londonderry, NH
	Annual	H	3.0	2.6	2.5	ppb	1.88	5.6	Londonderry, NH
CO [2]	1-Hour	H2H	0.5	0.5	0.5	ppm	1146	600.5	Londonderry, NH
	8-Hour	H2H	0.4	0.5	0.4	ppm	1146	573.0	Londonderry, NH
Ozone [4]	8-Hour	H4H	0.064	0.063	0.066	ppm	1963	129.6	Gilson Road, Nashua, NH

Notes:
From MassDEP's Annual Air Quality Reports and EPA's AirData Website
[1] SO_2 reported ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2.62 $\mu g/m^3$.
[2] CO reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1146 $\mu g/m^3$.
[3] NO_2 reported in ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1.88 $\mu g/m^3$.
[4] O_3 reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1963 $\mu g/m^3$.
[5] Background level is the average concentration of the three years.
[6] The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.
[7] The Annual PM10 standard was revoked by EPA on October 17, 2006, Federal Register 71-200, p. 61144.
[8] The monitoring sites in RED were dismantled for 2018. The next most representative monitor was used.

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
NAAQS Results - Stationary Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	BACKGROUND CONCENTRATION (μg/m^3)	TOTAL CONCENTRATION (μg/m^3)	STANDARD (μg/m^3)	% of Standard
PM_{10}	24 HOUR (2)	0.00350	17102124	300523.04, 4732042.34, 33.50, 45.14, 0.00	31.0	31.0	150	21%
$PM_{2.5}$	24 HOUR (3)	0.00256	2014-2018	300523.04, 4732042.34, 33.50, 45.14, 0.00	11.7	11.7	35	34%
	ANNUAL (4)	0.00004	2014-2018	300523.04, 4732042.34, 33.50, 45.14, 0.00	4.7	4.7	12	39%
NO_2	1 HOUR (5)	7.12176	2014-2018	300523.63, 4731999.11, 32.21, 45.08, 0.00	42.0	49.1	188	26%
	ANNUAL (1)	0.31022	2016	300523.04, 4732042.34, 33.50, 45.14, 0.00	5.6	6.0	100	6%

Notes:

(1) Highest Annual Concentration Over 5 Years

(2) Highest 6th-High Concentration Over 5 Years

(3) Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years

(4) Maximum Annual Concentration Averaged Over 5 Years

(5) Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
RTAPS Results - Stationary Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	STANDARD (μg/m^3)	% of Standard
Diesel Particulate	24 HOUR	0.000E+00	NA	NA	NA	NA
	ANNUAL	0.000E+00	NA	NA	5	0%
1,1,2,2-Tetrachloroethane	24 HOUR	2.283E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	25	0%
	ANNUAL	1.899E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	16	0%
1,1,2-Trichloroethane	24 HOUR	1.817E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	277	0%
	ANNUAL	1.517E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	184	0%
1,3-Butadiene	24 HOUR	1.506E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	2	0%
	ANNUAL	1.259E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	2	0%
1,3-Dichloropropene	24 HOUR	1.527E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	20	0%
	ANNUAL	1.269E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	20	0%
2,2,4-Trimethylpentane	24 HOUR	1.428E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.187E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
2-Methylnaphthalene	24 HOUR	1.894E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	15	0%
	ANNUAL	1.579E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	9.7	0%
Acenaphthene	24 HOUR	7.139E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	5.945E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Acenaphthylene	24 HOUR	3.160E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	2.632E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Acetaldehyde	24 HOUR	4.771E-01	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	161	0%
	ANNUAL	3.974E-03	2014	300523.031, 4732042.5, 33.5, 45.14, 0	9	0%
Acrolein	24 HOUR	2.933E-01	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.82	36%
	ANNUAL	2.446E-03	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.02	12%
Arsenic Compounds	24 HOUR	0.000E+00	NA	NA	0.036	0%
	ANNUAL	0.000E+00	NA	NA	0.024	0%
Benzene	24 HOUR	2.509E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	5.7	0%
	ANNUAL	2.095E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	3.8	0%
Benzo(b)fluoranthene	24 HOUR	9.472E-06	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.36	0%
	ANNUAL	7.895E-08	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.24	0%
Benzo(e)pyrene	24 HOUR	2.368E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.971E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Benzo(g,h,i)perylene	24 HOUR	2.361E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.971E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Biphenyl	24 HOUR	1.209E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	4.6	0%
	ANNUAL	1.008E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	3.1	0%
Carbon Tetrachloride	24 HOUR	2.092E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	111	0%
	ANNUAL	1.744E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	100	0%
Chlorobenzene	24 HOUR	1.732E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	231	0%
	ANNUAL	1.445E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	154	0%
Chloroform	24 HOUR	1.626E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	175	0%
	ANNUAL	1.352E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	117	0%
Chromium 6+	24 HOUR	0.000E+00	NA	NA	0.036	0%
	ANNUAL	0.000E+00	NA	NA	0.024	0%
Chrysene	24 HOUR	3.958E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.36	0%
	ANNUAL	3.292E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.24	0%

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
RTAPS Results - Stationary Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	STANDARD (μg/m^3)	% of Standard
Ethyl Benzene	24 HOUR	2.269E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	1000	0%
	ANNUAL	1.889E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	1000	0%
Ethylene Dibromide	24 HOUR	2.531E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.05	5%
	ANNUAL	2.105E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.05	0%
Fluoranthene	24 HOUR	6.333E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	5.284E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Fluorene	24 HOUR	3.240E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	2.694E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Formaldehyde	24 HOUR	2.799E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	1.3	2%
	ANNUAL	2.333E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.88	0%
Hexane	24 HOUR	6.333E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	885	0%
	ANNUAL	5.284E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	700	0%
Manganese Compounds	24 HOUR	0.000E+00	NA	NA	0.1	0%
	ANNUAL	0.000E+00	NA	NA	0.05	0%
Methanol	24 HOUR	1.428E-01	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	20000	0%
	ANNUAL	1.187E-03	2014	300523.031, 4732042.5, 33.5, 45.14, 0	20000	0%
Methylene Chloride	24 HOUR	1.145E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	621	0%
	ANNUAL	9.516E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	600	0%
Naphthalene	24 HOUR	4.248E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	186	0%
	ANNUAL	3.540E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	3	0%
Nickel Compounds	24 HOUR	0.000E+00	NA	NA	3.6	0%
	ANNUAL	0.000E+00	NA	NA	2.4	0%
PAH	24 HOUR	1.534E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.280E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Phenanthrene	24 HOUR	5.940E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.71	0%
	ANNUAL	4.944E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.48	0%
Phenol	24 HOUR	1.371E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	68	0%
	ANNUAL	1.146E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	45	0%
Propionaldehyde	24 HOUR	0.000E+00	NA	NA	239	0%
	ANNUAL	0.000E+00	NA	NA	8	0%
Pyrene	24 HOUR	7.775E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.71	0%
	ANNUAL [(1)]	6.471E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.48	0%
Styrene	24 HOUR	1.350E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	1000	0%
	ANNUAL	1.125E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	1000	0%
Tetrachloroethane	24 HOUR	1.414E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.177E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Toluene	24 HOUR	2.326E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	5000	0%
	ANNUAL	1.940E-04	2014	300523.031, 4732042.5, 33.5, 45.14, 0	5000	0%
Total Mercury Compounds	24 HOUR	0.000E+00	NA	NA	0.3	0%
	ANNUAL	0.000E+00	NA	NA	0.3	0%
Vinyl Chloride	24 HOUR	8.480E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	9.3	0%
	ANNUAL	7.090E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	6.2	0%
Xylene	24 HOUR	1.053E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	1550	0%
	ANNUAL	8.752E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	100	0%

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
NAAQS Results - Mobile Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	BACKGROUND CONCENTRATION (μg/m^3)	TOTAL CONCENTRATION (μg/m^3)	STANDARD (μg/m^3)	% of Standard
PM_{10}	24 HOUR (2)	1.67650	17012124	301399.83, 4732787.85, 38.69, 38.69, 0.00	31.0	32.7	150	22%
$PM_{2.5}$	24 HOUR (3)	0.62314	2014-2018	301399.83, 4732787.85, 38.69, 38.69, 0.00	11.7	12.4	35	35%
	ANNUAL (4)	0.23291	2014-2018	301399.83, 4732787.85, 38.69, 38.69, 0.00	4.7	4.9	12	41%
NO_2	1 HOUR (5)	43.50435	2014-2018	301489.05, 4732829.59, 39.89, 39.89, 0.00	42.0	85.5	188	45%
	ANNUAL (1)	3.64130	2015	301399.83, 4732787.85, 38.69, 38.69, 0.00	5.6	9.3	100	9%

Notes:

(1) Highest Annual Concentration Over 5 Years
(2) Highest 6th-High Concentration Over 5 Years
(3) Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years
(4) Maximum Annual Concentration Averaged Over 5 Years
(5) Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
RTAPS Results - Mobile Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION ($\mu g/m^3$)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	STANDARD ($\mu g/m^3$)	% of Standard
Diesel Particulate	24 HOUR	6.94E-01	15011224	301499.062, 4732759.5, 39.75, 39.75, 0	NA	NA
	ANNUAL	2.38E-01	2015	301399.844, 4732788, 38.69, 38.69, 0	5	5%
1,1,2,2-Tetrachloroethane	24 HOUR	0.00E+00	NA	NA	25	0%
	ANNUAL	0.00E+00	NA	NA	16	0%
1,1,2-Trichloroethane	24 HOUR	0.00E+00	NA	NA	277	0%
	ANNUAL	0.00E+00	NA	NA	184	0%
1,3-Butadiene	24 HOUR	0.00E+00	NA	NA	2	0%
	ANNUAL	0.00E+00	NA	NA	2	0%
1,3-Dichloropropene	24 HOUR	3.95E-03	15011224	301499.062, 4732759.5, 39.75, 39.75, 0	20	0%
	ANNUAL	1.36E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	20	0%
2,2,4-Trimethylpentane	24 HOUR	4.34E-02	14011124	301664.562, 4733167, 51.35, 51.35, 0	NA	NA
	ANNUAL	1.50E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	NA	NA
2-Methylnaphthalene	24 HOUR	0.00E+00	NA	NA	15	0%
	ANNUAL	0.00E+00	NA	NA	9.7	0%
Acenaphthene	24 HOUR	2.47E-04	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	NA	NA
	ANNUAL	8.47E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Acenaphthylene	24 HOUR	4.82E-04	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	NA	NA
	ANNUAL	1.66E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Acetaldehyde	24 HOUR	3.53E-02	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	161	0%
	ANNUAL	1.21E-02	2015	301399.844, 4732788, 38.69, 38.69, 0	9	0%
Acrolein	24 HOUR	6.11E-03	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	0.82	1%
	ANNUAL	2.10E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	0.02	10%
Arsenic Compounds	24 HOUR	1.14E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.036	3%
	ANNUAL	2.29E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.024	1%
Benzene	24 HOUR	4.55E-02	15011224	301664.562, 4732867, 46.41, 46.41, 0	5.7	1%
	ANNUAL	1.52E-02	2015	301399.844, 4732788, 38.69, 38.69, 0	3.8	0%
Benzo(b)fluoranthene	24 HOUR	4.18E-05	15011224	301499.062, 4732759.5, 39.75, 39.75, 0	0.36	0%
	ANNUAL	1.44E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	0.24	0%
Benzo(e)pyrene	24 HOUR	0.00E+00	NA	NA	NA	NA
	ANNUAL	0.00E+00	NA	NA	NA	NA
Benzo(g,h,i)perylene	24 HOUR	1.07E-04	15011224	301499.062, 4732759.5, 39.75, 39.75, 0	NA	NA
	ANNUAL	3.63E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Biphenyl	24 HOUR	0.00E+00	NA	NA	4.6	0%
	ANNUAL	0.00E+00	NA	NA	3.1	0%
Carbon Tetrachloride	24 HOUR	0.00E+00	NA	NA	111	0%
	ANNUAL	0.00E+00	NA	NA	100	0%
Chlorobenzene	24 HOUR	0.00E+00	NA	NA	231	0%
	ANNUAL	0.00E+00	NA	NA	154	0%
Chloroform	24 HOUR	0.00E+00	NA	NA	175	0%
	ANNUAL	0.00E+00	NA	NA	117	0%
Chromium 6+	24 HOUR	5.81E-06	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.036	0%
	ANNUAL	1.17E-06	2015	301399.844, 4732788, 38.69, 38.69, 0	0.024	0%
Chrysene	24 HOUR	1.74E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.36	0%
	ANNUAL	5.10E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	0.24	0%
Ethyl Benzene	24 HOUR	4.68E-02	14011124	301664.562, 4733167, 51.35, 51.35, 0	1000	0%
	ANNUAL	1.61E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	1000	0%
Ethylene Dibromide	24 HOUR	0.00E+00	NA	NA	0.05	0%
	ANNUAL	0.00E+00	NA	NA	0.05	0%

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
RTAPS Results - Mobile Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (µg/m³)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	STANDARD (µg/m³)	% of Standard
Fluoranthene	24 HOUR	7.56E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	NA	NA
	ANNUAL	2.30E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Fluorene	24 HOUR	6.12E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	NA	NA
	ANNUAL	2.01E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Formaldehyde	24 HOUR	8.38E-02	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	1.3	6%
	ANNUAL	2.88E-02	2015	301399.844, 4732788, 38.69, 38.69, 0	0.88	3%
Hexane	24 HOUR	4.18E-02	14011124	301664.562, 4733167, 51.35, 51.35, 0	885	0%
	ANNUAL	1.43E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	700	0%
Manganese Compounds	24 HOUR	7.82E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.1	1%
	ANNUAL	1.58E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.05	0%
Methanol	24 HOUR	0.00E+00	NA	NA	20000	0%
	ANNUAL	0.00E+00	NA	NA	20000	0%
Methylene Chloride	24 HOUR	0.00E+00	NA	NA	621	0%
	ANNUAL	0.00E+00	NA	NA	600	0%
Naphthalene	24 HOUR	9.23E-03	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	186	0%
	ANNUAL	3.17E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	3	0%
Nickel Compounds	24 HOUR	1.01E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	3.6	0%
	ANNUAL	2.04E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	2.4	0%
PAH	24 HOUR	0.00E+00	NA	NA	NA	NA
	ANNUAL	0.00E+00	NA	NA	NA	NA
Phenanthrene	24 HOUR	1.16E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.71	0%
	ANNUAL	3.83E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.48	0%
Phenol	24 HOUR	0.00E+00	NA	NA	68	0%
	ANNUAL	0.00E+00	NA	NA	45	0%
Propionaldehyde	24 HOUR	4.28E-03	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	239	0%
	ANNUAL	1.47E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	8	0%
Pyrene	24 HOUR	1.02E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.71	0%
	ANNUAL (1)	3.06E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.48	0%
Styrene	24 HOUR	1.55E-03	15011224	301499.062, 4732759.5, 39.75, 39.75, 0	1000	0%
	ANNUAL	5.33E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	1000	0%
Tetrachloroethane	24 HOUR	0.00E+00	NA	NA	NA	NA
	ANNUAL	0.00E+00	NA	NA	NA	NA
Toluene	24 HOUR	1.89E-01	14011124	301664.562, 4733167, 51.35, 51.35, 0	5000	0%
	ANNUAL	6.53E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	5000	0%
Total Mercury Compounds	24 HOUR	5.10E-05	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.3	0%
	ANNUAL	1.03E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	0.3	0%
Vinyl Chloride	24 HOUR	0.00E+00	NA	NA	9.3	0%
	ANNUAL	0.00E+00	NA	NA	6.2	0%
Xylene	24 HOUR	1.52E-01	14011124	301664.562, 4733167, 51.35, 51.35, 0	1550	0%
	ANNUAL	5.24E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	100	0%

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
NAAQS Results - All Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	BACKGROUND CONCENTRATION (μg/m^3)	TOTAL CONCENTRATION (μg/m^3)	STANDARD (μg/m^3)	% of Standard
PM_{10}	24 HOUR (2)	1.67665	17012124	301399.83, 4732787.85, 38.69, 38.69, 0.00	31.0	32.7	150	22%
$PM_{2.5}$	24 HOUR (3)	0.62321	2014-2018	301399.83, 4732787.85, 38.69, 38.69, 0.00	11.7	12.4	35	35%
	ANNUAL (4)	0.23292	2014-2018	301399.83, 4732787.85, 38.69, 38.69, 0.00	4.7	4.9	12	41%
NO_2	1 HOUR (5)	44.87300	2014-2018	301489.05, 4732829.59, 39.89, 39.89, 0.00	42.0	86.9	188	46%
	ANNUAL (1)	3.69918	2015	301399.83, 4732787.85, 38.69, 38.69, 0.00	5.6	9.3	100	9%

Notes:

(1) Highest Annual Concentration Over 5 Years
(2) Highest 6th-High Concentration Over 5 Years
(3) Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years
(4) Maximum Annual Concentration Averaged Over 5 Years
(5) Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

Hudson Logistics - Hudson, NH

AERMOD Dispersion Modeling Analysis

RTAPS Results - All Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m^3)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	STANDARD (μg/m^3)	% of Standard
Diesel Particulate	24 HOUR	6.937E-01	15011224	301499.062, 4732759.5, 39.75, 39.75, 0	NA	NA
	ANNUAL	2.385E-01	2015	301399.844, 4732788, 38.69, 38.69, 0	5	5%
1,1,2,2-Tetrachloroethane	24 HOUR	2.283E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	25	0%
	ANNUAL	1.860E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	16	0%
1,1,2-Trichloroethane	24 HOUR	1.817E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	277	0%
	ANNUAL	1.486E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	184	0%
1,3-Dichloropropene	24 HOUR	1.506E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	20	0%
	ANNUAL	1.234E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	20	0%
1,3-Butadiene	24 HOUR	1.676E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	2	1%
	ANNUAL	1.361E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	2	0%
2,2,4-Trimethylpentane	24 HOUR	4.344E-02	14011124	301664.562, 4733167, 51.35, 51.35, 0	NA	NA
	ANNUAL	1.498E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	NA	NA
2-Methylnaphthalene	24 HOUR	1.894E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	15	0%
	ANNUAL	1.547E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	9.7	0%
Acenaphthene	24 HOUR	2.794E-04	15011224	301119.125, 4731663.5, 47.58, 47.58, 0	NA	NA
	ANNUAL	8.474E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Acenaphthylene	24 HOUR	6.240E-04	15011224	301161, 4731686, 46.73, 46.73, 0	NA	NA
	ANNUAL	1.658E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Acetaldehyde	24 HOUR	4.917E-01	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	161	0%
	ANNUAL	1.213E-02	2015	301399.844, 4732788, 38.69, 38.69, 0	9	0%
Acrolein	24 HOUR	2.959E-01	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.82	36%
	ANNUAL	3.031E-03	2014	300637.219, 4733064.5, 42.82, 42.82, 0	0.02	15%
Arsenic Compounds	24 HOUR	1.140E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.036	3%
	ANNUAL	2.295E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.024	1%
Benzene	24 HOUR	4.761E-02	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	5.7	1%
	ANNUAL	1.518E-02	2015	301399.844, 4732788, 38.69, 38.69, 0	3.8	0%
Benzo(b)fluoranthene	24 HOUR	4.304E-05	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	0.36	0%
	ANNUAL	1.439E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	0.24	0%
Benzo(e)pyrene	24 HOUR	2.368E-05	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.931E-07	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Benzo(g,h,i)perylene	24 HOUR	1.083E-04	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	NA	NA
	ANNUAL	3.630E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Biphenyl	24 HOUR	1.209E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	4.6	0%
	ANNUAL	9.879E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	3.1	0%
Carbon Tetrachloride	24 HOUR	2.092E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	111	0%
	ANNUAL	1.709E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	100	0%
Chlorobenzene	24 HOUR	1.732E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	231	0%
	ANNUAL	1.416E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	154	0%
Chloroform	24 HOUR	1.626E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	175	0%
	ANNUAL	1.325E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	117	0%
Chromium 6+	24 HOUR	5.810E-06	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.036	0%
	ANNUAL	1.172E-06	2015	301399.844, 4732788, 38.69, 38.69, 0	0.024	0%
Chrysene	24 HOUR	1.738E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.36	0%
	ANNUAL	5.098E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	0.24	0%
Ethyl Benzene	24 HOUR	4.678E-02	14011124	301664.562, 4733167, 51.35, 51.35, 0	1000	0%
	ANNUAL	1.613E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	1000	0%
Ethylene Dibromide	24 HOUR	2.531E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	0.05	5%
	ANNUAL	2.063E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	0.05	0%

Hudson Logistics - Hudson, NH
AERMOD Dispersion Modeling Analysis
RTAPS Results - All Sources

POLLUTANT	AVERAGING TIME	MAXIMUM MODELED CONCENTRATION (μg/m³)	DATE of MODELED MAX (YYMMDDHH or YYYY)	Location (UTME, UTMN, Elev., Hill, Flagpole) (m)	STANDARD (μg/m³)	% of Standard
Fluoranthene	24 HOUR	7.560E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	NA	NA
	ANNUAL	2.301E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Fluorene	24 HOUR	7.490E-04	15011224	301161, 4731686, 46.73, 46.73, 0	NA	NA
	ANNUAL	2.011E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	NA	NA
Formaldehyde	24 HOUR	9.688E-02	15011224	301119.125, 4731663.5, 47.58, 47.58, 0	1.3	7%
	ANNUAL	2.876E-02	2015	301399.844, 4732788, 38.69, 38.69, 0	0.88	3%
Hexane	24 HOUR	7.166E-02	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	885	0%
	ANNUAL	1.433E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	700	0%
Manganese Compounds	24 HOUR	7.820E-04	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.1	1%
	ANNUAL	1.577E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.05	0%
Methanol	24 HOUR	1.428E-01	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	20000	0%
	ANNUAL	1.163E-03	2014	300523.031, 4732042.5, 33.5, 45.14, 0	20000	0%
Methylene Chloride	24 HOUR	1.145E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	621	0%
	ANNUAL	9.322E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	600	0%
Naphthalene	24 HOUR	1.121E-02	15011224	301161, 4731686, 46.73, 46.73, 0	186	0%
	ANNUAL	3.169E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	3	0%
Nickel Compounds	24 HOUR	1.010E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	3.6	0%
	ANNUAL	2.044E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	2.4	0%
PAH	24 HOUR	1.534E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.254E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Phenanthrene	24 HOUR	1.393E-03	15011224	301161, 4731686, 46.73, 46.73, 0	0.71	0%
	ANNUAL	3.825E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.48	0%
Phenol	24 HOUR	1.371E-03	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	68	0%
	ANNUAL	1.122E-05	2014	300523.031, 4732042.5, 33.5, 45.14, 0	45	0%
Propionaldehyde	24 HOUR	4.283E-03	14121624	301499.062, 4732759.5, 39.75, 39.75, 0	239	0%
	ANNUAL	1.471E-03	2015	301399.844, 4732788, 38.69, 38.69, 0	8	0%
Pyrene	24 HOUR	1.015E-03	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.71	0%
	ANNUAL [(1)]	3.057E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	0.48	0%
Styrene	24 HOUR	2.124E-03	15011224	301161, 4731686, 46.73, 46.73, 0	1000	0%
	ANNUAL	5.329E-04	2015	301399.844, 4732788, 38.69, 38.69, 0	1000	0%
Tetrachloroethane	24 HOUR	1.414E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
	ANNUAL	1.153E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	NA	NA
Toluene	24 HOUR	1.896E-01	14011124	301664.562, 4733167, 51.35, 51.35, 0	5000	0%
	ANNUAL	6.532E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	5000	0%
Total Mercury Compounds	24 HOUR	5.100E-05	15011224	301464.562, 4734267, 56.68, 56.68, 0	0.3	0%
	ANNUAL	1.028E-05	2015	301399.844, 4732788, 38.69, 38.69, 0	0.3	0%
Vinyl Chloride	24 HOUR	8.480E-04	17120224	300523.031, 4732042.5, 33.5, 45.14, 0	9.3	0%
	ANNUAL	6.946E-06	2014	300523.031, 4732042.5, 33.5, 45.14, 0	6.2	0%
Xylene	24 HOUR	1.519E-01	14011124	301664.562, 4733167, 51.35, 51.35, 0	1550	0%
	ANNUAL	5.243E-02	2015	301464.562, 4733267, 47.3, 47.3, 0	100	0%

Attachment B

Mobile Source Inputs

Hudson Logistics

Intersections (Signalized and *Unsignalized*)	2022 Mitigated Build Weekday AM Peak LOS	Delay (Sec)	Traffic Volume	2022 Mitigated Build Weekday PM Peak LOS	Delay (Sec)	Traffic Volume
1: River Road (Route 3A)/Lowell Road (Route 3A) & Dracut Road & Steele Road	A	7.7	70	B	12.9	98
2: Lowell Road (Route 3A) & Site Driveway/Rena Avenue	B	12.4	414	B	15.3	543
3: Lowell Road (Route 3A) & Sam's Club Driveway/Walmart Driveway	B	15.0	494	C	28.3	688
4: Lowell Road (Route 3A) & Sagamore Bridge Road	B	15.3	474	D	40.3	657
5: Lowell Road (Route 3A) & Flagstone Drive/Wason Road	D	47.3	82	C	34.6	113
6: Lowell Road (Route 3A) & Hampshire Drive/Oblate Drive	B	13.0	82	B	13.7	113
7: Lowell Road (Route 3A) & Executive Drive	C	30.3	82	B	19.6	113
8: Lowell Road (Route 3A) & Fox Hollow Drive/Nottingham Square Driveway	C	33.6	82	B	17.4	113
9: Lowell Road (Route 3A) & Pelham Road	D	55.0	82	E	72.4	113

LOS is HCM value for signalized intersections and ICU value for unsignalized intersections.
Color Code:
Red = Signalized intersections at LOS D or worse.
Green = Top 3 signalized intersections based on volume.
Dark Blue = Volume increase >20%
Light Blue = Volume increase > 10%
Yellow = New intersection to be constructed.
Yellow = Unsignalized intersection with delay > 180s. Capped at 180s
Purple/Orange = mitigated delay times decreased/increased

Hudson Logistics

2022 Mitigated Build

Intersection Peak Hour Emission Rates

				Idle MOVES Emission Factor NOX (g/hr)	Idle MOVES Emission Factor PM10 (g/hr)	Idle MOVES Emission Factor PM2.5 (g/hr)	Idle MOVES Emission Factor Diesel Particulate (g/hr)	Idle MOVES Emission Factor 1,3-Butadiene (g/hr)	Idle MOVES Emission Factor 2,2,4-Trimethylpentane (g/hr)	Idle MOVES Emission Factor Acenaphthene (g/hr)	Idle MOVES Emission Factor Acenaphthylene (g/hr)	Idle MOVES Emission Factor Acet-aldehyde (g/hr)	Idle MOVES Emission Factor Acrolein (g/hr)	Idle MOVES Emission Factor Arsenic (g/hr)	Idle MOVES Emission Factor Benzene (g/hr)	Idle MOVES Emission Factor Benzo(b)fluoranthene (g/hr)	Idle MOVES Emission Factor Benzo(g,h,i)perylene (g/hr)
				7.4200	0.5920	0.5430	5.43E-01	4.09E-03	2.03E-02	2.55E-04	4.73E-04	3.54E-02	6.24E-03	1.39E-03	3.04E-02	4.18E-05	5.45E-05
				NOX	PM10	PM2.5	Diesel Particulate	1,3Butadiene	2,2,4-Trimethylpentane	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Arsenic Compounds	Benzene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene
Source ID	Intersection	Average Peak Delay time (s/veh)	Peak Traffic Volume (vph)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
VOL1	1: River Road (Route 3A)/Lowell Road (Route 3A) & Dracut Road & Steele Road	10.73	98	6.02E-04	4.80E-05	4.41E-05	4.41E-05	3.32E-07	1.65E-06	2.07E-08	3.84E-08	2.87E-06	5.06E-07	1.13E-07	2.47E-06	3.39E-09	4.42E-09
VOL2	2: Lowell Road (Route 3A) & Site Driveway/Rena Avenue	14.05	543	4.37E-03	3.48E-04	3.20E-04	3.20E-04	2.41E-06	1.19E-05	1.50E-07	2.78E-07	2.08E-05	3.67E-06	8.18E-07	1.79E-05	2.46E-08	3.21E-08
VOL3	3: Lowell Road (Route 3A) & Sam's Club Driveway/Walmart Driveway	22.74	688	8.96E-03	7.15E-04	6.56E-04	6.56E-04	4.94E-06	2.45E-05	3.08E-07	5.71E-07	4.27E-05	7.53E-06	1.68E-06	3.67E-05	5.04E-08	6.58E-08
VOL4	4: Lowell Road (Route 3A) & Sagamore Bridge Road	29.82	657	1.12E-02	8.95E-04	8.21E-04	8.21E-04	6.18E-06	3.07E-05	3.86E-07	7.15E-07	5.35E-05	9.43E-06	2.10E-06	4.60E-05	6.31E-08	8.23E-08
VOL5	5: Lowell Road (Route 3A) & Flagstone Drive/Wason Road	39.94	113	2.58E-03	2.06E-04	1.89E-04	1.89E-04	1.42E-06	7.07E-06	8.88E-08	1.65E-07	1.23E-05	2.17E-06	4.84E-07	1.06E-05	1.45E-08	1.90E-08
VOL6	6: Lowell Road (Route 3A) & Hampshire Drive/Oblate Drive	13.41	113	8.67E-04	6.92E-05	6.35E-05	6.35E-05	4.78E-07	2.37E-06	2.98E-08	5.53E-08	4.14E-06	7.29E-07	1.62E-07	3.55E-06	4.88E-09	6.37E-09
VOL7	7: Lowell Road (Route 3A) & Executive Drive	24.10	113	1.56E-03	1.24E-04	1.14E-04	1.14E-04	8.59E-07	4.27E-06	5.36E-08	9.93E-08	7.44E-06	1.31E-06	2.92E-07	6.39E-06	8.77E-09	1.14E-08
VOL8	8: Lowell Road (Route 3A) & Fox Hollow Drive/Nottingham Square Driveway	24.21	113	1.57E-03	1.25E-04	1.15E-04	1.15E-04	8.63E-07	4.29E-06	5.38E-08	9.98E-08	7.47E-06	1.32E-06	2.93E-07	6.42E-06	8.82E-09	1.15E-08
VOL9	9: Lowell Road (Route 3A) & Pelham Road	65.08	113	4.21E-03	3.36E-04	3.08E-04	3.08E-04	2.32E-06	1.15E-05	1.45E-07	2.68E-07	2.01E-05	3.54E-06	7.89E-07	1.73E-05	2.37E-08	3.09E-08

Hudson Logistics

2022 Mitigated Build

Intersection Peak Hour Emission Rates

			Idle MOVES Emission Factor Chromium 6+ (g/hr)	Idle MOVES Emission Factor Chrysene (g/hr)	Idle MOVES Emission Factor Ethyl Benzene (g/hr)	Idle MOVES Emission Factor Fluoranthene (g/hr)	Idle MOVES Emission Factor Fluorene (g/hr)	Idle MOVES Emission Factor Formal-dehyde (g/hr)	Idle MOVES Emission Factor Hexane (g/hr)	Idle MOVES Emission Factor Manganese (g/hr)	Idle MOVES Emission Factor Mercury (g/hr)	Idle MOVES Emission Factor MTBE (g/hr)	Idle MOVES Emission Factor Naph-thalene (g/hr)	Idle MOVES Emission Factor Nickel (g/hr)	Idle MOVES Emission Factor Phenanthrene (g/hr)	Idle MOVES Emission Factor Propion-aldehyde (g/hr)	Idle MOVES Emission Factor Pyrene (g/hr)	Idle MOVES Emission Factor Styrene (g/hr)	Idle MOVES Emission Factor Toluene (g/hr)	Idle MOVES Emission Factor Xylene (g/hr)
			7.07E-06	1.99E-04	2.36E-02	8.50E-04	6.72E-04	8.35E-02	1.90E-02	9.54E-04	6.21E-05	0.00E+00	9.17E-03	1.23E-03	1.28E-03	4.29E-03	1.15E-03	1.44E-03	9.16E-02	7.63E-02
			Chromium 6+	Chrysene	Ethyl Benzene	Fluoranthene	Fluorene	Formaldehyde	Hexane	Manganese Compounds	Total Mercury Compounds	MTBE	Naphthalene	Nickel Compounds	Phenanthrene	Propionaldehyde	Pyrene	Styrene	Toluene	Xylene
Intersection	Average Peak Delay time (s/veh)	Peak Traffic Volume (vph)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)	(g/s)
1: River Road (Route 3A)/Lowell Road (Route 3A) & Dracut Road & Steele Road	10.73	98	5.74E-10	1.61E-08	1.92E-06	6.90E-08	5.45E-08	6.78E-06	1.54E-06	7.74E-08	5.04E-09	0.00E+00	7.44E-07	9.98E-08	1.04E-07	3.48E-07	9.33E-08	1.17E-07	7.43E-06	6.19E-06
2: Lowell Road (Route 3A) & Site Driveway/Rena Avenue	14.05	543	4.16E-09	1.17E-07	1.39E-05	5.00E-07	3.95E-07	4.91E-05	1.12E-05	5.61E-07	3.65E-08	0.00E+00	5.40E-06	7.24E-07	7.51E-07	2.52E-06	6.77E-07	8.47E-07	5.39E-05	4.49E-05
3: Lowell Road (Route 3A) & Sam's Club Driveway/Walmart Driveway	22.74	688	8.54E-09	2.40E-07	2.85E-05	1.03E-06	8.11E-07	1.01E-04	2.29E-05	1.15E-06	7.50E-08	0.00E+00	1.11E-05	1.48E-06	1.54E-06	5.18E-06	1.39E-06	1.74E-06	1.11E-04	9.21E-05
4: Lowell Road (Route 3A) & Sagamore Bridge Road	29.82	657	1.07E-08	3.01E-07	3.57E-05	1.29E-06	1.02E-06	1.26E-04	2.87E-05	1.44E-06	9.39E-08	0.00E+00	1.39E-05	1.86E-06	1.93E-06	6.49E-06	1.74E-06	2.18E-06	1.38E-04	1.15E-04
5: Lowell Road (Route 3A) & Flagstone Drive/Wason Road	39.94	113	2.46E-09	6.92E-08	8.22E-06	2.96E-07	2.34E-07	2.91E-05	6.62E-06	3.32E-07	2.16E-08	0.00E+00	3.19E-06	4.28E-07	4.44E-07	1.49E-06	4.00E-07	5.01E-07	3.19E-05	2.66E-05
6: Lowell Road (Route 3A) & Hampshire Drive/Oblate Drive	13.41	113	8.26E-10	2.32E-08	2.76E-06	9.94E-08	7.85E-08	9.76E-06	2.22E-06	1.12E-07	7.26E-09	0.00E+00	1.07E-06	1.44E-07	1.49E-07	5.01E-07	1.34E-07	1.68E-07	1.07E-05	8.92E-06
7: Lowell Road (Route 3A) & Executive Drive	24.10	113	1.49E-09	4.18E-08	4.96E-06	1.79E-07	1.41E-07	1.75E-05	3.99E-06	2.00E-07	1.30E-08	0.00E+00	1.93E-06	2.58E-07	2.68E-07	9.01E-07	2.42E-07	3.03E-07	1.92E-05	1.60E-05
8: Lowell Road (Route 3A) & Fox Hollow Drive/Nottingham Square Driveway	24.21	113	1.49E-09	4.20E-08	4.98E-06	1.79E-07	1.42E-07	1.76E-05	4.01E-06	2.01E-07	1.31E-08	0.00E+00	1.94E-06	2.60E-07	2.69E-07	9.06E-07	2.43E-07	3.04E-07	1.93E-05	1.61E-05
9: Lowell Road (Route 3A) & Pelham Road	65.08	113	4.01E-09	1.13E-07	1.34E-05	4.82E-07	3.81E-07	4.74E-05	1.08E-05	5.41E-07	3.52E-08	0.00E+00	5.21E-06	6.98E-07	7.24E-07	2.43E-06	6.53E-07	8.17E-07	5.20E-05	4.33E-05

Hudson Logistics Center

2022 Build

Onsite Lot Peak Hour Emission Rates

				Larger Diesel Trucks Only	Idle MOVES Emission Factor NOX (g/hr)	Idle MOVES Emission Factor PM10 (g/hr)	Idle MOVES Emission Factor PM2.5 (g/hr)	Idle MOVES Emission Factor Diesel Particulate (g/hr)	Idle MOVES Emission Factor 1,3-Butadiene (g/hr)	Idle MOVES Emission Factor 2,2,4-Trimethylpentane (g/hr)	Idle MOVES Emission Factor Acenaphthene (g/hr)	Idle MOVES Emission Factor Acenaphthylene (g/hr)	Idle MOVES Emission Factor Acet-aldehyde (g/hr)	Idle MOVES Emission Factor Acrolein (g/hr)	Idle MOVES Emission Factor Arsenic (g/hr)	Idle MOVES Emission Factor Benzene (g/hr)	Idle MOVES Emission Factor Benzo(b)fluoranthene (g/hr)	Idle MOVES Emission Factor Benzo(g,h,i)perylene (g/hr)	Idle MOVES Emission Factor Chromium 6+ (g/hr)	Idle MOVES Emission Factor Chrysene (g/hr)	Idle MOVES Emission Factor Ethyl Benzene (g/hr)	Idle MOVES Emission Factor Fluoranthene (g/hr)	Idle MOVES Emission Factor Fluorene (g/hr)
					6.9566	0.5453	0.5017	5.02E-01	2.32E-03	2.11E-03	2.34E-04	3.94E-04	3.25E-02	5.84E-03	2.01E-04	7.05E-03	1.59E-05	3.27E-06	9.27E-07	1.03E-04	2.56E-03	5.54E-04	5.13E-04
			Average Peak Delay time	Peak Truck Traffic Volume	NOX	PM10	PM2.5	Diesel Particulate	1,3Butadiene	2,2,4-Trimethylpentane	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Arsenic Compounds	Benzene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chromium 6+	Chrysene	Ethyl Benzene	Fluoranthene	Fluorene
Source ID	**Lot**	**Lot Area (m2)**	**(s/veh)**	**(vph)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**
LOTA	Lot A	60875.8	900.00	20	1.59E-07	1.24E-08	1.14E-08	1.14E-08	5.29E-11	4.82E-11	5.35E-12	8.99E-12	7.41E-10	1.33E-10	4.58E-12	1.61E-10	3.64E-13	7.45E-14	2.11E-14	2.35E-12	5.83E-11	1.26E-11	1.17E-11
LOTB	Lot B	34974.2	900.00	26	3.59E-07	2.82E-08	2.59E-08	2.59E-08	1.20E-10	1.09E-10	1.21E-11	2.03E-11	1.68E-09	3.01E-10	1.04E-11	3.64E-10	8.23E-13	1.69E-13	4.78E-14	5.32E-12	1.32E-10	2.86E-11	2.65E-11
LOTC	Lot C	54773.4	900.00	13	1.15E-07	8.99E-09	8.27E-09	8.27E-09	3.82E-11	3.48E-11	3.86E-12	6.49E-12	5.35E-10	9.62E-11	3.31E-12	1.16E-10	2.63E-13	5.38E-14	1.53E-14	1.70E-12	4.21E-11	9.12E-12	8.46E-12

Hudson Logistics Center

2022 Build

Onsite Lot Peak Hour Emission Rates

			Larger Diesel Trucks Only	**Idle MOVES Emission Factor Formal-dehyde (g/hr)**	**Idle MOVES Emission Factor Hexane (g/hr)**	**Idle MOVES Emission Factor Manganese (g/hr)**	**Idle MOVES Emission Factor Mercury (g/hr)**	**Idle MOVES Emission Factor MTBE (g/hr)**	**Idle MOVES Emission Factor Naph-thalene (g/hr)**	**Idle MOVES Emission Factor Nickel (g/hr)**	**Idle MOVES Emission Factor Phenanthrene (g/hr)**	**Idle MOVES Emission Factor Propion-aldehyde (g/hr)**	**Idle MOVES Emission Factor Pyrene (g/hr)**	**Idle MOVES Emission Factor Styrene (g/hr)**	**Idle MOVES Emission Factor Toluene (g/hr)**	**Idle MOVES Emission Factor Xylene (g/hr)**
				7.60E-02	2.08E-03	0.00E+00	9.60E-07	0.00E+00	8.16E-03	4.52E-04	8.97E-04	3.84E-03	7.31E-04	1.02E-03	5.71E-03	5.83E-03
		Average Peak Delay time	**Peak Truck Traffic Volume**	**Formaldehyde**	**Hexane**	**Manganese Compounds**	**Total Mercury Compounds**	**MTBE**	**Naphthalene**	**Nickel Compounds**	**Phenanthrene**	**Propionaldehyde**	**Pyrene**	**Styrene**	**Toluene**	**Xylene**
Lot	**Lot Area (m2)**	**(s/veh)**	**(vph)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**	**(g/s/m2)**
Lot A	60875.8	900.00	20	1.73E-09	4.75E-11	0.00E+00	2.19E-14	0.00E+00	1.86E-10	1.03E-11	2.05E-11	8.77E-11	1.67E-11	2.32E-11	1.30E-10	1.33E-10
Lot B	34974.2	900.00	26	3.92E-09	1.08E-10	0.00E+00	4.95E-14	0.00E+00	4.22E-10	2.34E-11	4.63E-11	1.98E-10	3.77E-11	5.25E-11	2.95E-10	3.01E-10
Lot C	54773.4	900.00	13	1.25E-09	3.43E-11	0.00E+00	1.58E-14	0.00E+00	1.35E-10	7.46E-12	1.48E-11	6.34E-11	1.20E-11	1.67E-11	9.41E-11	9.60E-11

Langan Hudson Logistics

Regional Mesoscale Emissions Analysis - Roadway Emissions
Link Data (June 2020)

Link Number	Roadway Segment	Link Distance (meters)	Link Distance (miles)	Link Average Width (ft)	Estimated Average Speed (mph)	AM Peak Hour Volume Project Trips	PM Peak Hour Volume Project Trips
L1	River Road, S of Dracut/Steele	279.00	0.17	68	30	10	11
L3	Dracut Road, (River Rd to Stuart Street)	266.30	0.17	50	30	54	75
L4	Lowell Road, Dracut Rd to Rena Ave/Site Drive	539.20	0.34	80	30	71	98
L6	Site Driveway to Rotary	687.50	0.43	54	20	394	512
L7	Lowell Road, Rena/Site to Walmart/Sams Drive	299.50	0.19	106	30	363	476
L8	Sams Driveway	374.60	0.23	75	20	151	243
L10	Lowell Rd, Walmart/Sams to Sagamore Bridge Rd	316.30	0.20	110	30	474	657
L11	Sagamore Bridge Rd WB	1,151.90	0.72	50	50	241	269
L12	Sagamore Bridge Rd EB	1,010.90	0.63	50	50	151	275
L13	Lowell Rd, Sagamore Bridge Rd to Flagstone/Wason	338.70	0.21	90	30	82	113
L16	Lowell Rd, Wason/Flagstone to Oblate/Hampshire	457.50	0.28	90	30	82	113
L19	Lowell Rd, Oblate/Hampshire to Executive Dr	553.90	0.34	75	30	82	113
L22	Lowell Rd, Executive to Nottingham Sq, Fox Hollow	780.80	0.49	75	30	82	113
L25	Lowell Rd, Fox/Nottingham to Pelham Rd	197.10	0.12	60	30	82	113
L27	Lowell Rd, N of Pelham Rd	150.60	0.09	0	30	82	113
L28	Lot A Road	993.40	0.62	50	10	238	384
L29	Lot B Road	609.10	0.38	50	10	220	270
L30	Lot C Road	636.20	0.40	50	10	115	141

Hudson Logistics

2022 Build

Roadway Link Peak Hour Emission Rates (g/s)

Link Number	Roadway Segment	Link Distance (meters)	Link Distance (miles)	NOX	Total PM10	Total PM2.5	SO2	Diesel Particulate	1,3Butadiene	2,2,4-Trimethylpentane	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Arsenic Compounds	Benzene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chromium 6+	Chrysene
L1	River Road, S of Dracut/Steele	279	0.1734	7.37E-04	8.51E-05	4.19E-05	3.89E-06	3.30E-05	1.63E-07	2.73E-06	1.00E-08	1.99E-08	1.43E-06	2.47E-07	2.45E-08	2.43E-06	1.62E-09	4.32E-09	1.25E-10	5.50E-09
L3	Dracut Road, (River Rd to Stuart Street)	266.3	0.1655	4.79E-03	5.54E-04	2.72E-04	2.53E-05	2.15E-04	1.06E-06	1.83E-05	6.53E-08	1.29E-07	9.30E-06	1.61E-06	1.59E-07	1.60E-05	1.06E-08	2.81E-08	8.13E-10	3.58E-08
L4	Lowell Road, Dracut Rd to Rena Ave/Site Drive	539.2	0.3350	1.27E-02	1.46E-03	7.21E-04	6.69E-05	5.69E-04	2.80E-06	3.18E-05	1.73E-07	3.42E-07	2.46E-05	4.26E-06	4.21E-07	3.53E-05	2.79E-08	7.43E-08	2.15E-09	9.48E-08
L6	Site Driveway to Rotary	687.5	0.4272	9.61E-02	1.31E-02	5.91E-03	5.40E-04	4.46E-03	2.52E-05	2.20E-04	1.56E-06	3.06E-06	2.23E-04	3.86E-05	4.21E-06	2.81E-04	2.70E-07	6.91E-07	2.15E-08	9.46E-07
L7	Lowell Road, Rena/Site to Walmart/Sams Drive	299.5	0.1861	3.42E-02	3.95E-03	1.94E-03	1.80E-04	1.53E-03	7.56E-06	1.21E-04	4.66E-07	9.24E-07	6.64E-05	1.15E-05	1.14E-06	1.10E-04	7.54E-08	2.00E-07	5.80E-09	2.56E-07
L8	Sams Driveway	374.6	0.2328	2.48E-02	3.39E-03	1.53E-03	1.40E-04	1.15E-03	6.51E-06	7.54E-05	4.02E-07	7.91E-07	5.76E-05	9.98E-06	1.09E-06	8.05E-05	6.99E-08	1.79E-07	5.56E-09	2.45E-07
L10	Lowell Rd, Walmart/Sams to Sagamore Bridge Rd	316.3	0.1965	4.99E-02	5.76E-03	2.84E-03	2.63E-04	2.24E-03	1.10E-05	1.70E-04	6.79E-07	1.35E-06	9.67E-05	1.67E-05	1.66E-06	1.58E-04	1.10E-07	2.92E-07	8.46E-09	3.73E-07
L11	Sagamore Bridge Rd WB	1151.9	0.7158	6.25E-02	4.01E-03	2.43E-03	3.34E-04	1.97E-03	1.21E-05	1.12E-04	7.60E-07	1.51E-06	1.07E-04	1.85E-05	1.48E-06	1.42E-04	1.17E-07	3.67E-07	7.57E-09	3.49E-07
L12	Sagamore Bridge Rd EB	1010.9	0.6281	5.60E-02	3.60E-03	2.18E-03	3.00E-04	1.77E-03	1.08E-05	1.06E-04	6.82E-07	1.35E-06	9.58E-05	1.66E-05	1.33E-06	1.30E-04	1.05E-07	3.29E-07	6.79E-09	3.13E-07
L13	Lowell Rd, Sagamore Bridge Rd to Flagstone/Wason	338.7	0.2105	9.19E-03	1.06E-03	5.22E-04	4.85E-05	4.12E-04	2.03E-06	3.00E-05	1.25E-07	2.48E-07	1.78E-05	3.08E-06	3.05E-07	2.86E-05	2.02E-08	5.38E-08	1.56E-09	6.86E-08
L16	Lowell Rd, Wason/Flagstone to Oblate/Hampshire	457.5	0.2843	1.24E-02	1.43E-03	7.05E-04	6.54E-05	5.57E-04	2.74E-06	3.40E-05	1.69E-07	3.35E-07	2.41E-05	4.17E-06	4.12E-07	3.57E-05	2.73E-08	7.27E-08	2.10E-09	9.27E-08
L19	Lowell Rd, Oblate/Hampshire to Executive Dr	553.9	0.3442	1.50E-02	1.74E-03	8.54E-04	7.92E-05	6.74E-04	3.32E-06	3.72E-05	2.04E-07	4.06E-07	2.91E-05	5.04E-06	4.99E-07	4.16E-05	3.31E-08	8.80E-08	2.55E-09	1.12E-07
L22	Lowell Rd, Executive to Nottingham Sq, Fox Hollow	780.8	0.4852	2.12E-02	2.45E-03	1.20E-03	1.12E-04	9.50E-04	4.68E-06	4.48E-05	2.88E-07	5.72E-07	4.11E-05	7.11E-06	7.03E-07	5.53E-05	4.67E-08	1.24E-07	3.59E-09	1.58E-07
L25	Lowell Rd, Fox/Nottingham to Pelham Rd	197.1	0.1225	5.35E-03	6.17E-04	3.04E-04	2.82E-05	2.40E-04	1.18E-06	2.53E-05	7.28E-08	1.44E-07	1.04E-05	1.79E-06	1.78E-07	2.00E-05	1.18E-08	3.13E-08	9.06E-10	3.99E-08
L27	Lowell Rd, N of Pelham Rd	150.6	0.0936	4.09E-03	4.72E-04	2.32E-04	2.15E-05	1.83E-04	9.03E-07	2.38E-05	5.56E-08	1.10E-07	7.92E-06	1.37E-06	1.36E-07	1.72E-05	9.00E-09	2.39E-08	6.93E-10	3.05E-08
L28	Lot A Road	993.4	0.6173	1.38E-01	2.49E-02	9.31E-03	8.31E-04	6.52E-03	4.72E-05	2.92E-04	3.09E-06	5.87E-06	4.45E-04	7.75E-05	9.12E-06	4.29E-04	4.69E-07	9.37E-07	4.66E-08	1.92E-06
L29	Lot B Road	609.1	0.3785	5.95E-02	1.07E-02	4.01E-03	3.58E-04	2.81E-03	2.03E-05	1.43E-04	1.33E-06	2.53E-06	1.92E-04	3.34E-05	3.93E-06	1.92E-04	2.02E-07	4.04E-07	2.01E-08	8.29E-07
L30	Lot C Road	636.2	0.3953	3.25E-02	5.86E-03	2.19E-03	1.95E-04	1.53E-03	1.11E-05	7.70E-05	7.27E-07	1.38E-06	1.05E-04	1.82E-05	2.15E-06	1.05E-04	1.10E-07	2.20E-07	1.10E-08	4.52E-07

Hudson Logistics

2022 Build

Roadway Link Peak Hour Emission Rates (g/s)

Link Number	Roadway Segment	Link Distance (meters)	Link Distance (miles)	Ethyl Benzene	Fluoranthene	Fluorene	Formaldehyde	Hexane	Manganese Compounds	Total Mercury Compounds	Naphthalene	Nickel Compounds	Phenanthrene	Propionaldehyde	Pyrene	Styrene	Toluene	Xylene
L1	River Road, S of Dracut/Steele	279	0.1734	2.96E-06	2.56E-08	2.31E-08	3.40E-06	2.70E-06	1.69E-08	1.10E-09	3.76E-07	2.17E-08	4.39E-08	1.75E-07	3.39E-08	6.48E-08	1.20E-05	9.60E-06
L3	Dracut Road, (River Rd to Stuart Street)	266.3	0.1655	1.99E-05	1.67E-07	1.50E-07	2.21E-05	1.82E-05	1.10E-07	7.13E-09	2.45E-06	1.41E-07	2.86E-07	1.14E-06	2.20E-07	4.22E-07	8.09E-05	6.45E-05
L4	Lowell Road, Dracut Rd to Rena Ave/Site Drive	539.2	0.3350	3.36E-05	4.42E-07	3.98E-07	5.85E-05	2.91E-05	2.90E-07	1.89E-08	6.47E-06	3.74E-07	7.55E-07	3.01E-06	5.83E-07	1.12E-06	1.36E-04	1.10E-04
L6	Site Driveway to Rotary	687.5	0.4272	2.31E-04	4.25E-06	3.71E-06	5.30E-04	1.92E-04	2.90E-06	1.89E-07	5.84E-05	3.74E-06	7.06E-06	2.71E-05	5.65E-06	9.87E-06	9.33E-04	7.58E-04
L7	Lowell Road, Rena/Site to Walmart/Sams Drive	299.5	0.1861	1.31E-04	1.19E-06	1.07E-06	1.58E-04	1.19E-04	7.83E-07	5.09E-08	1.75E-05	1.01E-06	2.04E-06	8.13E-06	1.57E-06	3.01E-06	5.32E-04	4.25E-04
L8	Sams Driveway	374.6	0.2328	8.07E-05	1.10E-06	9.58E-07	1.37E-04	7.07E-05	7.50E-07	4.88E-08	1.51E-05	9.66E-07	1.83E-06	7.00E-06	1.46E-06	2.55E-06	3.27E-04	2.63E-04
L10	Lowell Rd, Walmart/Sams to Sagamore Bridge Rd	316.3	0.1965	1.84E-04	1.74E-06	1.56E-06	2.30E-04	1.66E-04	1.14E-06	7.42E-08	2.55E-05	1.47E-06	2.97E-06	1.18E-05	2.29E-06	4.39E-06	7.46E-04	5.97E-04
L11	Sagamore Bridge Rd WB	1151.9	0.7158	1.14E-04	1.72E-06	1.65E-06	2.52E-04	9.39E-05	1.02E-06	6.64E-08	2.81E-05	1.32E-06	3.06E-06	1.32E-05	2.24E-06	4.89E-06	4.62E-04	3.74E-04
L12	Sagamore Bridge Rd EB	1010.9	0.6281	1.09E-04	1.54E-06	1.48E-06	2.26E-04	9.06E-05	9.16E-07	5.96E-08	2.52E-05	1.18E-06	2.75E-06	1.19E-05	2.01E-06	4.39E-06	4.40E-04	3.56E-04
L13	Lowell Rd, Sagamore Bridge Rd to Flagstone/Wason	338.7	0.2105	3.23E-05	3.20E-07	2.88E-07	4.23E-05	2.91E-05	2.10E-07	1.37E-08	4.69E-06	2.71E-07	5.47E-07	2.18E-06	4.22E-07	8.08E-07	1.31E-04	1.05E-04
L16	Lowell Rd, Wason/Flagstone to Oblate/Hampshire	457.5	0.2843	3.61E-05	4.32E-07	3.89E-07	5.72E-05	3.17E-05	2.84E-07	1.85E-08	6.33E-06	3.66E-07	7.39E-07	2.95E-06	5.70E-07	1.09E-06	1.47E-04	1.18E-04
L19	Lowell Rd, Oblate/Hampshire to Executive Dr	553.9	0.3442	3.92E-05	5.23E-07	4.71E-07	6.92E-05	3.39E-05	3.44E-07	2.24E-08	7.67E-06	4.43E-07	8.95E-07	3.57E-06	6.90E-07	1.32E-06	1.59E-04	1.28E-04
L22	Lowell Rd, Executive to Nottingham Sq, Fox Hollow	780.8	0.4852	4.65E-05	7.37E-07	6.64E-07	9.76E-05	3.90E-05	4.84E-07	3.15E-08	1.08E-05	6.24E-07	1.26E-06	5.03E-06	9.73E-07	1.86E-06	1.89E-04	1.53E-04
L25	Lowell Rd, Fox/Nottingham to Pelham Rd	197.1	0.1225	2.78E-05	1.86E-07	1.68E-07	2.46E-05	2.59E-05	1.22E-07	7.95E-09	2.73E-06	1.58E-07	3.18E-07	1.27E-06	2.46E-07	4.70E-07	1.13E-04	8.97E-05
L27	Lowell Rd, N of Pelham Rd	150.6	0.0936	2.63E-05	1.42E-07	1.28E-07	1.88E-05	2.49E-05	9.34E-08	6.08E-09	2.08E-06	1.20E-07	2.43E-07	9.70E-07	1.88E-07	3.59E-07	1.07E-04	8.47E-05
L28	Lot A Road	993.4	0.6173	3.08E-04	8.72E-06	7.47E-06	1.06E-03	2.46E-04	6.28E-06	4.09E-07	1.15E-04	8.10E-06	1.41E-05	5.32E-05	1.16E-05	1.82E-05	1.23E-03	1.01E-03
L29	Lot B Road	609.1	0.3785	1.53E-04	3.76E-06	3.22E-06	4.57E-04	1.26E-04	2.71E-06	1.76E-07	4.98E-05	3.49E-06	6.09E-06	2.29E-05	5.02E-06	7.85E-06	6.10E-04	4.99E-04
L30	Lot C Road	636.2	0.3953	8.21E-05	2.05E-06	1.76E-06	2.49E-04	6.75E-05	1.48E-06	9.61E-08	2.72E-05	1.90E-06	3.32E-06	1.25E-05	2.74E-06	4.28E-06	3.28E-04	2.69E-04

Attachment C

Mobile Source Temporal Factors

Langan Hudson Logistics

Mobile Source Temporal Variations

Offsite Roadways and Intersections

Hours	January	February	March	April	May	June	July	August	September	October	November	December
0:00	0.3469	0.3412	0.3076	0.2970	0.2862	0.2826	0.2928	0.2910	0.2946	0.2892	0.2982	0.2937
1:00	0.2857	0.2810	0.2533	0.2446	0.2357	0.2327	0.2411	0.2397	0.2426	0.2382	0.2456	0.2419
2:00	0.3878	0.3814	0.3437	0.3320	0.3199	0.3158	0.3273	0.3253	0.3293	0.3232	0.3333	0.3283
3:00	0.4694	0.4617	0.4161	0.4019	0.3872	0.3823	0.3962	0.3937	0.3986	0.3913	0.4035	0.3974
4:00	0.5102	0.5018	0.4523	0.4368	0.4209	0.4156	0.4306	0.4280	0.4333	0.4253	0.4386	0.4319
5:00	0.6531	0.6423	0.5789	0.5591	0.5387	0.5320	0.5512	0.5478	0.5546	0.5444	0.5614	0.5529
6:00	0.6327	0.6222	0.5608	0.5416	0.5219	0.5153	0.5340	0.5307	0.5373	0.5274	0.5438	0.5356
7:00	0.5714	0.5620	0.5066	0.4892	0.4714	0.4655	0.4823	0.4793	0.4853	0.4764	0.4912	0.4838
8:00	0.6122	0.6022	0.5427	0.5242	0.5051	0.4987	0.5167	0.5136	0.5199	0.5104	0.5263	0.5183
9:00	0.9592	0.9434	0.8503	0.8212	0.7913	0.7813	0.8096	0.8046	0.8146	0.7996	0.8245	0.8121
10:00	0.8980	0.8832	0.7960	0.7688	0.7408	0.7314	0.7579	0.7532	0.7626	0.7486	0.7719	0.7602
11:00	1.0000	0.9835	0.8865	0.8562	0.8250	0.8146	0.8440	0.8388	0.8492	0.8336	0.8596	0.8466
12:00	0.7347	0.7226	0.6513	0.6290	0.6061	0.5985	0.6201	0.6163	0.6239	0.6125	0.6316	0.6220
13:00	0.7755	0.7627	0.6875	0.6640	0.6398	0.6317	0.6545	0.6505	0.6586	0.6465	0.6666	0.6566
14:00	0.5918	0.5821	0.5247	0.5067	0.4882	0.4821	0.4995	0.4964	0.5026	0.4934	0.5088	0.5011
15:00	0.8163	0.8029	0.7237	0.6989	0.6734	0.6649	0.6890	0.6848	0.6932	0.6805	0.7017	0.6911
16:00	0.6122	0.6022	0.5427	0.5242	0.5051	0.4987	0.5167	0.5136	0.5199	0.5104	0.5263	0.5183
17:00	0.4082	0.4014	0.3618	0.3495	0.3367	0.3325	0.3445	0.3424	0.3466	0.3403	0.3509	0.3456
18:00	0.1837	0.1806	0.1628	0.1573	0.1515	0.1496	0.1550	0.1541	0.1560	0.1531	0.1579	0.1555
19:00	0.2041	0.2007	0.1809	0.1747	0.1684	0.1662	0.1722	0.1712	0.1733	0.1701	0.1754	0.1728
20:00	0.2041	0.2007	0.1809	0.1747	0.1684	0.1662	0.1722	0.1712	0.1733	0.1701	0.1754	0.1728
21:00	0.1837	0.1806	0.1628	0.1573	0.1515	0.1496	0.1550	0.1541	0.1560	0.1531	0.1579	0.1555
22:00	0.1633	0.1606	0.1447	0.1398	0.1347	0.1330	0.1378	0.1370	0.1386	0.1361	0.1403	0.1382
23:00	0.2857	0.2810	0.2533	0.2446	0.2357	0.2327	0.2411	0.2397	0.2426	0.2382	0.2456	0.2419

Lot A and Lot A Road

Hours	January	February	March	April	May	June	July	August	September	October	November	December
0:00	0.8000	0.7868	0.7092	0.6849	0.6600	0.6516	0.6752	0.6711	0.6794	0.6669	0.6877	0.6773
1:00	0.7000	0.6885	0.6205	0.5993	0.5775	0.5702	0.5908	0.5872	0.5945	0.5835	0.6017	0.5926
2:00	0.7000	0.6885	0.6205	0.5993	0.5775	0.5702	0.5908	0.5872	0.5945	0.5835	0.6017	0.5926
3:00	0.9000	0.8852	0.7978	0.7705	0.7425	0.7331	0.7596	0.7549	0.7643	0.7503	0.7737	0.7620
4:00	0.8000	0.7868	0.7092	0.6849	0.6600	0.6516	0.6752	0.6711	0.6794	0.6669	0.6877	0.6773
5:00	1.0000	0.9835	0.8865	0.8562	0.8250	0.8146	0.8440	0.8388	0.8492	0.8336	0.8596	0.8466
6:00	0.8000	0.7868	0.7092	0.6849	0.6600	0.6516	0.6752	0.6711	0.6794	0.6669	0.6877	0.6773
7:00	0.5000	0.4918	0.4432	0.4281	0.4125	0.4073	0.4220	0.4194	0.4246	0.4168	0.4298	0.4233
8:00	0.5000	0.4918	0.4432	0.4281	0.4125	0.4073	0.4220	0.4194	0.4246	0.4168	0.4298	0.4233
9:00	0.6000	0.5901	0.5319	0.5137	0.4950	0.4887	0.5064	0.5033	0.5095	0.5002	0.5158	0.5080
10:00	0.5000	0.4918	0.4432	0.4281	0.4125	0.4073	0.4220	0.4194	0.4246	0.4168	0.4298	0.4233
11:00	0.5000	0.4918	0.4432	0.4281	0.4125	0.4073	0.4220	0.4194	0.4246	0.4168	0.4298	0.4233
12:00	0.6000	0.5901	0.5319	0.5137	0.4950	0.4887	0.5064	0.5033	0.5095	0.5002	0.5158	0.5080
13:00	0.5000	0.4918	0.4432	0.4281	0.4125	0.4073	0.4220	0.4194	0.4246	0.4168	0.4298	0.4233
14:00	0.4000	0.3934	0.3546	0.3425	0.3300	0.3258	0.3376	0.3355	0.3397	0.3334	0.3438	0.3386
15:00	0.4000	0.3934	0.3546	0.3425	0.3300	0.3258	0.3376	0.3355	0.3397	0.3334	0.3438	0.3386
16:00	0.3000	0.2951	0.2659	0.2568	0.2475	0.2444	0.2532	0.2516	0.2548	0.2501	0.2579	0.2540
17:00	0.3000	0.2951	0.2659	0.2568	0.2475	0.2444	0.2532	0.2516	0.2548	0.2501	0.2579	0.2540
18:00	0.3000	0.2951	0.2659	0.2568	0.2475	0.2444	0.2532	0.2516	0.2548	0.2501	0.2579	0.2540
19:00	0.4000	0.3934	0.3546	0.3425	0.3300	0.3258	0.3376	0.3355	0.3397	0.3334	0.3438	0.3386
20:00	0.2000	0.1967	0.1773	0.1712	0.1650	0.1629	0.1688	0.1678	0.1698	0.1667	0.1719	0.1693
21:00	0.3000	0.2951	0.2659	0.2568	0.2475	0.2444	0.2532	0.2516	0.2548	0.2501	0.2579	0.2540
22:00	0.4000	0.3934	0.3546	0.3425	0.3300	0.3258	0.3376	0.3355	0.3397	0.3334	0.3438	0.3386
23:00	0.7000	0.6885	0.6205	0.5993	0.5775	0.5702	0.5908	0.5872	0.5945	0.5835	0.6017	0.5926

Langan Hudson Logistics

Mobile Source Temporal Variations

Lot B and Lot B Road

Hours	January	February	March	April	May	June	July	August	September	October	November	December
0:00	0.0385	0.0378	0.0341	0.0329	0.0317	0.0313	0.0325	0.0323	0.0327	0.0321	0.0331	0.0326
1:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2:00	0.1154	0.1135	0.1023	0.0988	0.0952	0.0940	0.0974	0.0968	0.0980	0.0962	0.0992	0.0977
3:00	0.1154	0.1135	0.1023	0.0988	0.0952	0.0940	0.0974	0.0968	0.0980	0.0962	0.0992	0.0977
4:00	0.2308	0.2270	0.2046	0.1976	0.1904	0.1880	0.1948	0.1936	0.1960	0.1924	0.1984	0.1954
5:00	0.3077	0.3026	0.2728	0.2634	0.2538	0.2506	0.2597	0.2581	0.2613	0.2565	0.2645	0.2605
6:00	0.3846	0.3783	0.3410	0.3293	0.3173	0.3133	0.3246	0.3226	0.3266	0.3206	0.3306	0.3256
7:00	0.4615	0.4539	0.4091	0.3951	0.3807	0.3759	0.3895	0.3871	0.3919	0.3847	0.3967	0.3907
8:00	0.5000	0.4918	0.4432	0.4281	0.4125	0.4073	0.4220	0.4194	0.4246	0.4168	0.4298	0.4233
9:00	0.8846	0.8701	0.7842	0.7574	0.7298	0.7206	0.7466	0.7420	0.7512	0.7374	0.7604	0.7489
10:00	0.8462	0.8322	0.7501	0.7244	0.6980	0.6892	0.7142	0.7098	0.7186	0.7054	0.7274	0.7164
11:00	1.0000	0.9835	0.8865	0.8562	0.8250	0.8146	0.8440	0.8388	0.8492	0.8336	0.8596	0.8466
12:00	0.6154	0.6053	0.5455	0.5269	0.5077	0.5013	0.5194	0.5162	0.5226	0.5130	0.5290	0.5210
13:00	0.6923	0.6809	0.6137	0.5927	0.5711	0.5639	0.5843	0.5807	0.5879	0.5771	0.5951	0.5861
14:00	0.5385	0.5296	0.4773	0.4610	0.4442	0.4386	0.4545	0.4517	0.4573	0.4489	0.4629	0.4559
15:00	0.8077	0.7944	0.7160	0.6915	0.6663	0.6579	0.6817	0.6775	0.6859	0.6733	0.6943	0.6838
16:00	0.6154	0.6053	0.5455	0.5269	0.5077	0.5013	0.5194	0.5162	0.5226	0.5130	0.5290	0.5210
17:00	0.3462	0.3405	0.3069	0.2964	0.2856	0.2820	0.2922	0.2904	0.2940	0.2886	0.2976	0.2931
18:00	0.0769	0.0757	0.0682	0.0659	0.0635	0.0627	0.0649	0.0645	0.0653	0.0641	0.0661	0.0651
19:00	0.0385	0.0378	0.0341	0.0329	0.0317	0.0313	0.0325	0.0323	0.0327	0.0321	0.0331	0.0326
20:00	0.1538	0.1513	0.1364	0.1317	0.1269	0.1253	0.1298	0.1290	0.1306	0.1282	0.1322	0.1302
21:00	0.0769	0.0757	0.0682	0.0659	0.0635	0.0627	0.0649	0.0645	0.0653	0.0641	0.0661	0.0651
22:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Lot C and Lot C Road

Hours	January	February	March	April	May	June	July	August	September	October	November	December
0:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2:00	0.1538	0.1513	0.1364	0.1317	0.1269	0.1253	0.1298	0.1290	0.1306	0.1282	0.1322	0.1302
3:00	0.1538	0.1513	0.1364	0.1317	0.1269	0.1253	0.1298	0.1290	0.1306	0.1282	0.1322	0.1302
4:00	0.2308	0.2270	0.2046	0.1976	0.1904	0.1880	0.1948	0.1936	0.1960	0.1924	0.1984	0.1954
5:00	0.3077	0.3026	0.2728	0.2634	0.2538	0.2506	0.2597	0.2581	0.2613	0.2565	0.2645	0.2605
6:00	0.3846	0.3783	0.3410	0.3293	0.3173	0.3133	0.3246	0.3226	0.3266	0.3206	0.3306	0.3256
7:00	0.4615	0.4539	0.4091	0.3951	0.3807	0.3759	0.3895	0.3871	0.3919	0.3847	0.3967	0.3907
8:00	0.5385	0.5296	0.4773	0.4610	0.4442	0.4386	0.4545	0.4517	0.4573	0.4489	0.4629	0.4559
9:00	0.9231	0.9079	0.8183	0.7903	0.7615	0.7519	0.7791	0.7743	0.7839	0.7695	0.7935	0.7815
10:00	0.9231	0.9079	0.8183	0.7903	0.7615	0.7519	0.7791	0.7743	0.7839	0.7695	0.7935	0.7815
11:00	1.0000	0.9835	0.8865	0.8562	0.8250	0.8146	0.8440	0.8388	0.8492	0.8336	0.8596	0.8466
12:00	0.6154	0.6053	0.5455	0.5269	0.5077	0.5013	0.5194	0.5162	0.5226	0.5130	0.5290	0.5210
13:00	0.7692	0.7566	0.6819	0.6586	0.6346	0.6266	0.6492	0.6452	0.6532	0.6412	0.6612	0.6512
14:00	0.5385	0.5296	0.4773	0.4610	0.4442	0.4386	0.4545	0.4517	0.4573	0.4489	0.4629	0.4559
15:00	0.8462	0.8322	0.7501	0.7244	0.6980	0.6892	0.7142	0.7098	0.7186	0.7054	0.7274	0.7164
16:00	0.6154	0.6053	0.5455	0.5269	0.5077	0.5013	0.5194	0.5162	0.5226	0.5130	0.5290	0.5210
17:00	0.3846	0.3783	0.3410	0.3293	0.3173	0.3133	0.3246	0.3226	0.3266	0.3206	0.3306	0.3256
18:00	0.0769	0.0757	0.0682	0.0659	0.0635	0.0627	0.0649	0.0645	0.0653	0.0641	0.0661	0.0651
19:00	0.0769	0.0757	0.0682	0.0659	0.0635	0.0627	0.0649	0.0645	0.0653	0.0641	0.0661	0.0651
20:00	0.1538	0.1513	0.1364	0.1317	0.1269	0.1253	0.1298	0.1290	0.1306	0.1282	0.1322	0.1302
21:00	0.0769	0.0757	0.0682	0.0659	0.0635	0.0627	0.0649	0.0645	0.0653	0.0641	0.0661	0.0651
22:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Attachment D

Responses To Tetra Tech PEER Review

MEMORANDUM

Date: November 17, 2020

To: Nate Kirschner, Langdon

From: Vincent Tino

Subject: Responses to Review Comments – Hudson Logistics

Review of the Air Quality Impact Report

- Tetra Tech agrees with the use of the AERMOD modeling system, the USEPA regulatory model recommended for stationary sources and transportation projects, however the model version is listed in the report as 19091 (page 3-2 for AERMOD, and page 3-4 for AERMET). These both should be version 19191. The correct model version, 19191, was used in the modeling analysis.
    - Agreed. "19091" is a typographical error.
- Tetra Tech agrees with the criteria pollutants selected for modeling, NO_2, PM_{10} and $PM_{2.5.}$ Please provide further justification for not modeling CO emissions from mobile sources with respect to Federal Highway Administration guidance.
    - CO was not modeled for a number of reasons.
        - CO from vehicles has been reduced dramatically in the past 40 years. However, the NAAQS for CO have not changed since 1971.
        - New Hampshire has been in attainment of the 1-hour CO NAAQS since its inception in 1971, and in attainment of the 8-hour CO NAAQS since 1990. (https://www4.des.state.nh.us/appc/?page_id=44)
        - It is our experience, with performing intersection air quality analyses on over 100 of Boston's worst performing intersections, that modeled concentrations of CO are insignificant compared to the CO NAAQS.
        - Ambient concentrations of CO are no longer a significant health hazard.
- Please provide a justification for not addressing particulate matter emission in the form of fugitive dust from paved road surfaces.
    - All roads in the study area are paved and the project is not industrial in nature. The contents of any vehicles travelling to and from the project site and their tires will be clean. There will be no spillage or track out of solids such as there might be on an industrial site where solids or waste are being handled or transported. Paved road dust emission factors in AP-42 are relatively small especially for relatively busy roads such as found in this study area. The addition of the traffic from the project would not significantly increase the average weight of the vehicles travelling on the roads so there would only be a small

increase in the dust from the road surface. Onsite, the distances to receptors are such that the small amount of road dust generated on-site and would not be expected to cause a modeled exceedance of the NAAQS. MOVES already includes particulate matter from tire and brake wear, which has historically been a component of roadway fugitive dust. Public comments have focused on concerns with diesel exhaust.

- Tetra Tech agrees with the use of the AERMOD regulatory default model options.
  - No response necessary.
- Tetra Tech agrees with the use of the Ambient Ratio Method (ARM2) with the default input ratios to address the atmospheric chemical conversion of emissions of nitrogen oxides to nitrogen dioxide.
  - No response necessary.
- Tetra Tech agrees with the rural dispersion classification for the area within 3 km of the Project site.
  - No response necessary.
- Tetra Tech agrees with the selection of the meteorological data used in the modeling.
  - No response necessary.
- Tetra Tech feels that the receptor (locations at which the model will calculate predicted concentrations) placement in the modeling was adequate to capture the air quality impacts near the Project. The report indicates that 1,711 receptor locations were modeled.
  - No response necessary.
- Tetra Tech agrees with the terrain elevation processing with AERMAP version 18081, that used 1/3 arc-second National Elevation Data from the United States Geological Survey to assign elevations for the receptors and offsite roadway sources. AERMAP was also used to assign base elevations to the onsite roadways, stationary sources and buildings. Perhaps these onsite base elevations should have been set according to the Project final grading plans.
  - It is expected that the base elevations provided through AERMAP would not be significantly different than the graded plans and would not materially alter the results of the analysis.
- Tetra Tech feels that the report should address how the modeling and postprocessing of the Regulated Toxic Air Pollutants (RTAP) was conducted in more detail (see further discussion below).
  - RTAP modeling was conducted using the Lakes AERMOD View multi-pollutant processing routines. The software automatically creates the unit emission AERMOD inputs for each source, and postprocesses the results at the completion of the AERMOD runs. Epsilon did not create or modify any of the Lakes software for this project.

Existing Air Quality

Section 2.2 Background Air Quality of the Report specifically discussed the ambient monitoring data that were used to characterize the existing air quality for the Project site and the ambient background concentrations that will be added to the model result prior to comparison with the National Ambient Air Quality Standards (NAAQS). The measured ambient air quality data selected for the Project is presented in Table 2-2 and supported with more detail in a Table in Attachment A. Tetra Tech reviewed the information presented and provide the following comments:

- The ambient concentrations presented for SO_2 are not correct and overstate the existing SO_2 ambient concentrations. Table 2-2 presents 1-hour SO_2 concentrations of 43.0, 31.7 and 38.3 µg/m^3, and 3-hour SO_2 concentrations of 30.7, 28.8 and 32.5 µg/m^3 for 2016, 2017 and 2018, respectively (see excerpt of Table 2-2 below). The Table in Attachment A indicates that these values are from the Concord, NH monitor, however the Concord, NH monitor only measured SO_2 concentrations in 2016, and did not monitor SO_2 concentrations in 2017 or 2018. In 2016 the measured concentrations at the Concord monitor for 1-hour SO_2 was reported as 4.9 ppb (12.8 µg/m^3) and the 3-hour SO_2 was reported as 5.0 ppb (13.1 µg/m^3), which are much less than the concentrations presented in Table 2-2. Even if the Concord monitor had continued collecting SO_2 data, the Londonderry monitor, which is much closer to and more representative of the Project site, should have been used. This would have also been consistent with the use of the Londonderry monitor to characterize the existing concentrations of $PM_{2.5}$, NO_2, and CO for this Project. The measured SO_2 concentrations at the Londonderry monitor are presented in the second Table below (Table 2-2 Corrected excerpt).

Table 2-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

POLLUTANT	AVG TIME	Form	2016	2017	2018	Background (µg/m³)	NAAQS	Percent of NAAQS
SO_2 (1)(5)	1-Hr (4)	99th %	43.0	31.7	38.3	37.6	196.0	19%
	3-Hr	H2H	30.7	28.8	32.5	32.5	1300.0	2%

Table 2-2 Corrected SO_2 Ambient Air Quality Concentrations and Selected Background

Pollutant	Avg Time	Form	2016	2017	2018	Background (µg/m³)	NAAQS	Percent of NAAQS
SO_2	1-Hr	99th %	7.6	5.8	9.4	7.6	196	4%
	3-Hr	H2H	8.1	5.8	8.1	8.1	1300	1%

  - Noted. Additionally, SO_2 emissions are not a pollutant of concern for this study as the application of ultra-low sulfur diesel fuel as significantly reduced SO_2 emissions from vehicles.

- Footnote 1 and Footnote 3 in Table 2-2 in the report incorrectly state the factors used to convert the SO_2 and NO_2 monitoring concentrations reported in ppb to µg/m^3. The Table 2-2 footnotes state the conversion factors as: 1 ppm SO_2 = 2.62 µg/m^3
  1 ppm NO_2 = 1.88 µg/m^3
  The correct conversion factors are:
  1 ppb SO_2 = 2.62 µg/m^3
  1 ppb NO_2 = 1.88 µg/m^3
  Although the factors in the footnotes were misstated, the correct conversion factors were applied to the NO_2 concentrations in Table 2-2.
  - Agreed. Units label of 1 ppm in the footnotes as stated are incorrect.

Stationary source parameters and pollutant emission rates

- Tetra Tech confirmed the horsepower rating, hourly heat input rate, exhaust flow, and exhaust temperature of the Generac SG625 engine.
  - No response necessary.
- Tetra Tech confirmed the correct Subpart JJJJ NOx value was used in Table 3-3.
  - No response necessary.
- Tetra Tech confirmed the AP-42 Table 3.2-2 emission factors for PM_{10} and $PM_{2.5}$, as well as the Hazardous Air Pollutant (HAP) emission factors, also from AP-42 Table 3.2-2.
  - No response necessary.
- Tetra Tech confirmed the short-term and annualized (based on a maximum of 500 hours per year of operation) emission rates for NOx and HAPs were calculated correctly.
  - No response necessary.
- Tetra Tech identified an error in the Excel file when calculating grams per second (g/s) for PM_{10} and $PM_{2.5}$ resulting in incorrect emission rates presented in Table 3-4 of the Report and incorrect emission rates used in the AERMOD modeling for PM_{10} and $PM_{2.5}$. The calculation for the Particulate Matter (PM) g/s rates in cells C49-50 and C56-57 on the "building" tab neglected to convert from pounds to grams. The original and corrected emission rates are summarized in the table below. The corrected emission rates are larger than those used in the modeling, however the modeled impacts of PM_{10} and $PM_{2.5}$ from the stationary sources will remain less than 0.01 $\mu g/m^3$ as reported in Table 4-1 of the Report if the revised emission rates were used.

Emergency Generator PM emission rates (per generator)

PM_{10} and $PM_{2.5}$	Short-term (g/s)	Annual (g/s)
As in Report (Table 3-4)	1.37E-07	7.83E-09
Corrected Emission Rates	6.22E-05	3.55E-06

  - We agree with this assessment. An incorrect emission factor was used. However, the results as shown in the attached revised Report do not change as the change is in the decimals.

Building Downwash

- Tetra Tech advises that the final graded Project base elevation be used so that the base elevations of each building and the adjacent emergency generator are the same.
  - The differences in base elevations between the stacks and adjacent buildings range from 1.08 meters to 2.35 meters. This difference primarily affects building downwash effects on stack exhaust. Stacks subject to building downwash generally have highest concentrations immediately adjacent to the leeward side of the building. Since the sources are at a substantial distance from receptors and nearby residences, it would be expected that this change would have little to no effect on offsite predicted concentrations.
- Tetra Tech confirmed that BPIP-Prime was executed properly for the three emergency generator stacks and the three warehouse buildings.
  - No response necessary.

Motor Vehicle Emissions Simulator (MOVES) model run

- MOVES time settings – Please provide an explanation for the time settings used in MOVES, which evaluated emissions at March 8:00-8:59 only.
  - To extract emission rates from MOVES, a project-level analysis is required. Project-level analyses allow only a single time to be input. It was assumed that a weekday mid-morning in spring would be an acceptable representation of the entire year.
- MOVES source type fractions – Based on the files provided, the vehicle mix assumed in MOVES appears to be 24% passenger cars, 51% passenger trucks, 3% single-unit short haul trucks, and12% combo long-haul trucks. Was a different vehicle mix assumed for the 'Diesel Exhaust Only' scenario (Lot emissions)? If so, what source type fractions were assumed?
  - The only fuel-vehicle combinations selected were diesel combination long- and short-haul trucks and diesel single unit long- and short-haul trucks
- Attachment B Table 2022 Mitigated Build LOS-VOLs – The table presents peak LOS, delay (sec), and traffic volume (per hour) for weekday AM and PM under the 2022 Mitigated Build scenario. Please provide more information on how AM and PM peak traffic volume were calculated for each intersection.
  - Traffic volumes were obtained from Figure 7 and the associated SYNCHRO reports of the Traffic Impact Study (TIS), dated September 2020, for Hudson Logistics Center Hudson, New Hampshire
- Attachment B Table 2022 Mitigated Build Intersection Peak Hour Emission Rates – Peak traffic volume (vph) is based on PM (peak) conditions, while delay time (s/veh) is based on the average of AM and PM conditions. Please provide justification for using peak conditions for traffic volumes, but average conditions for delay time.
  - It has been our experience that delay times at an intersection can vary widely from AM to PM peak. In general, we have found it overly conservative to use the higher peak hour delay time and the higher peak hour volume together. Since hourly distribution data is provided for vehicle trips, we were able to include that distribution in the modeling. However, calculation of hourly, daily, and monthly distributions of delay times would require that data be provided in the Traffic Impact Study. The use of this method provides a reasonable approximation that's conservative, yet not unrealistically conservative.
- Attachment B Table 2022 Mitigated Build Intersection Peak Hour Emission Rates – Diesel Particulate emissions appear to be equal to PM2.5 emissions. Please update the emission rates for Diesel Particulate to be based on the 'Diesel Exhaust Only' MOVES emission rates.
  - Diesel particulate emissions were conservatively assumed to be equal to PM2.5 emissions. The idle emission factor for PM2.5 exhaust only from the full fleet 0.543 g/hr was higher than that shown in the diesel exhaust only of 0.502 g/hr. Therefore, the more conservative (higher) idle emission rate was used, resulting in an overestimation of the impact.
- Attachment B Table 2022 Build Roadway Link Peak Hour Emission Rates (g/s) – Diesel Particulate emissions appear to be based on the PM2.5 emissions from the 'Diesel Exhaust Only' MOVES emission rates. Please update the emission rates for Diesel Particulate to be based on PM10 instead of PM2.5.
  - The California Air Resource Board (CARB) states that "More than 90% of DPM is less than 1 µm in diameter (about 1/70th the diameter of a human hair), and thus is a subset of particulate matter less than 2.5 microns in diameter (PM2.5)." (https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health) Thus, using

PM2.5 as a surrogate for diesel particulate is not only justified, but also conservative. Use of PM10 as a surrogate for diesel particulate would be overly conservative.

- Attachment B Table 2022 Build Onsite Lot Peak Hour Emission Rates – The table includes a column for Diesel Particulate emission rates that appear to be equal to the PM2.5 emission rates. Please update the emission rates for Diesel Particulate to be based on PM10 instead of PM2.5.
  - The California Air Resource Board (CARB) states that "More than 90% of DPM is less than 1 µm in diameter (about 1/70th the diameter of a human hair), and thus is a subset of particulate matter less than 2.5 microns in diameter (PM2.5)." (https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health) Thus, using PM2.5 as a surrogate for diesel particulate is not only justified, but also conservative. Use of PM10 as a surrogate for diesel particulate would be overly conservative.
  - Diesel particulate emissions were conservatively assumed to be equal to PM2.5 emissions. The idle emission factor for PM2.5 exhaust only from the full fleet 0.543 g/hr was higher than that shown in the diesel exhaust only of 0.502 g/hr. Therefore, the more conservative idle emission rate was used, resulting in an overestimation of the impact.
- Attachment B Table 2022 Build Onsite Lot Peak Hour Emission Rates – Peak truck traffic volumes for Lots A, B, and C were assumed to be 20, 26, and 13 vehicles per hour, respectively. The spreadsheet Link Data.xlsx shows peak traffic volumes for Lots A, B, and C were estimated to be 384, 270, and 141, respectively. Please clarify.
  - The peak volumes for the link data (384, 270, and 141) were taken from Table 4 of the September 2020 TIS. The peak data for the lots were taken from truck information in a table provided by Justin Dunn on 7/2/2020.
  - Although all types of vehicles enter the lots via the onsite roads, it is assumed that employee passenger vehicles will not idle on a regular basis, as adequate parking is available. Therefore, only idling diesel truck emissions are included in the lot emissions.
- Tetra Tech reviewed the emission factors presented in the Excel spreadsheets, but the MySQL output database files were not included in the files provided, therefore Tetra Tech was unable to verify the final MOVES results. Electronic files should be provided with the report.
  - Epsilon provided the NHDES inputs, as well as the MOVES "runspec" files. Epsilon can work with Tetra Tech to provide other additional files as needed.

AERMOD Model Inputs, Options and Modeling Methodology

- Stationary Sources (STCK1, STCK2 and STCK3)
  - Release Height in Table 3-2 is 3.98 m, in the AERMOD modeling 3.96 m is used.
  - Gas Exit Velocity in Table 3-2 is 59.231 m/s, in the AERMOD modeling 59.31 m/s is used.
  - Calculations shown in the attachment show that 3.96 meters and 59.231 m/s should have been used in the AERMOD runs. However, these differences would be insignificant in terms of model output. The difference in release height of 0.02 meters equals 0.78 inches, which would not be expected to affect predicted concentrations in AERMOD. The difference in exit velocity of 0.08 m/s would also not be expected to significantly affect predicted concentrations in AERMOD.
- The number of receptors described in the Report (Section 3.2.6) is 1,711. The PM_{10} and $PM_{2.5}$ runs each had 1,581 receptors which included onsite receptors. Concentrations should be predicted at

offsite locations at the facility fence line and beyond representing "ambient" air (locations were the general public has access). The NO_2 and RTAPs runs used 1,711 receptors and properly removed receptors that were within the facility fence line.

  - The PM10 and PM2.5 runs used an outdated ROU receptor file. The receptors have been corrected and the results reflect the corrected modeling.

- The PM_{10} and $PM_{2.5}$ predicted concentrations reported in Table 4-1, Table 4-2 and Table 4-3 represent onsite predicted concentrations. These should be based on the maximum design value concentrations predicted at offsite receptors. NO_2 impacts are correctly reported at offsite receptors in these tables based on the parameters modeled.
  - The PM10 and PM2.5 runs used an outdated ROU receptor file. The receptors have been corrected and the results reflect the corrected modeling.
- No description of the mobile source parameters is included in the report. Please provide details explaining the assumptions used to derive the release heights, and horizontal and vertical dimensions of the volume sources used to represent intersections and roadways and the area sources representing the parking lots.
  - Section J.3 of Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas – Appendices (https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100NN22.pdf) discusses how to characterize mobile emission sources in AERMOD.
  - For the intersection sources, vehicles are not moving, so we assumed no initial mixing and growth of volume source. Set release height to weighted average of vehicle heights (2.1m). Intersection Sigma-Ys were based on visual inspections of the intersection size.
  - For the roadway links, Sigma-Y is determined by the roadway width and varies by roadway. Road widths were measured in Google Earth and initial Sigma-Y values were calculated using width / 2.15 as described in the guidance referenced above.
  - For the lots, it is assumed mostly heavy-duty trucks. The above reference says to assume 4-meter release height and to assume 3.2 meters for Sigma-Z.
- Tetra Tech confirmed the emission rates and the temporal variation of the emissions as presented in the Attachment B and Attachment C tables, respectively, were applied properly in the AERMOD model runs.
  - No response necessary.
- No description was provided for the post-processing methodology for the RTAPs impact analysis. It appears the methodology was based on unit emission runs for each source. Then a postprocessing step was used to scale the unit results to pollutant-specific impacts at each receptor (generating plot files) and then sum the pollutant-specific results for each source to get a total impact result. Tetra Tech reviewed the unit emission runs, but the postprocessing program used to create the pollutant specific results was not included in the files provided, therefore Tetra Tech was unable to verify the final RTAP results.
  - RTAP modeling was conducted using the Lakes AERMOD View multi-pollutant processing routines. The software automatically creates the unit emission AERMOD inputs for each source, and postprocesses the results at the completion of the AERMOD runs. Epsilon did not create or modify any of the Lakes software for this project.