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Guidance for Conducting Cumulative Impact Analysis For Air Quality Comprehensive Plan Applications

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1 Introduction

In accordance with Chapter 8 of the Acts of 2021 ("An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy"), on March 29, 2024 the Massachusetts Department of Environmental Protection (MassDEP) promulgated amendments to 310 CMR 7.00 *Air Pollution Control* that require an applicant to conduct a cumulative impact analysis (CIA) as part of a Comprehensive Plan Application (CPA) for a facility located in or near environmental justice (EJ) populations. The CIA requirements are contained in a new section, 310 CMR 7.02(14), and require an applicant to perform enhanced public outreach to and involvement of EJ populations, assessment of existing community conditions, and analysis of cumulative impacts of a proposed project that must be contained in a CIA Report included in the CPA. This document provides guidance on how to conduct a CIA. A CIA includes the steps below.

Steps	Description
1. Public Notice and Involvement	At least 60 days prior to filing a CPA, develop project fact sheet, notify EJ populations, local officials, and MassDEP and provide public outreach and involvement.
2. Assessment of existing community conditions	Describe the existing conditions of nearby EJ populations using environmental, public health, and socioeconomic indicators, including conditions and concerns raised by EJ populations.
3. Air quality dispersion modeling	Conduct air dispersion modeling for criteria pollutants that would be emitted by the proposed project, taking into account emissions from other significant air pollution sources, added vehicle emissions, and existing air quality background.
4. Air toxics risk characterization	Characterize cumulative risks of harm from air toxics that would be emitted by the proposed project, taking into account emissions from other significant air pollution sources.
5. Evaluation of proposed project cumulative impacts	Evaluate and describe how air pollutant emissions could affect existing environmental and public health conditions.
6. CIA report and public notice	Prepare CIA report and submit it to MassDEP with the CPA and notify EJ populations and the public of their availability and how the public can submit informal comments.
7. MassDEP review and proposed decision	MassDEP reviews the CIA report and CPA and issues a proposed decision for a 60-day formal public comment period.
8. MassDEP final decision	After review of public comments, MassDEP issues a final decision on the CPA.

2 Applicability

As described in 310 CMR 7.02(14)(a), an applicant is required to conduct a CIA for a CPA for a new facility or emission unit located in an EJ population or within:

- one mile of an EJ population if the facility or emission unit will not be a major source of air pollutants, or
- five miles of an EJ population if the facility or emission unit will be a major source of air pollutants.

CPA applicability criteria are listed in 310 CMR 7.02(5) and include a facility or emission unit that meets any of the following:

- Potential annual process (i.e., non-combustion) emissions ≥ 10 tons per year
- Combustion units that meet certain fuel input thresholds (e.g., ≥ 40 mmBTU/hour natural gas boiler)
- Incinerators
- Non-emergency engines (except a CIA is not required for non-emergency engines restricted to 100 hours of operation per year)

Major source thresholds include a facility with potential annual emissions of:

- 50 tons of nitrogen oxides or volatile organic compounds
- 100 tons of any other criteria pollutant (i.e., sulfur dioxide, particulate matter, carbon monoxide, lead)
- 10 tons of any individual HAP
- 25 tons of combined hazardous air pollutants (HAPs)

An applicant also is required to conduct a CIA for an application for an existing facility or emission unit that already has a CPA if the applicant proposes in a new CPA to increase facility-wide potential emissions of criteria pollutants, hazardous air pollutants, or air toxics, excluding CO_2e, individually or in the aggregate, by an amount equal to or greater than 1 ton per year, and the existing facility or emission unit is located in an environmental justice population or within:

- one mile of an EJ population if the facility or emission unit will not be a major source of air pollutants, and
- five miles of an EJ population if the facility or emissions unit will be a major source of air pollution.

A CIA is not required for a CPA for an existing facility where the applicant proposes a project to decrease facility-wide potential emissions, but the project would temporarily increase emissions to facilitate the eventual decrease (provided the increase is for no more than two years). An example is a facility that is replacing older equipment with new less polluting equipment but is doing so sequentially or a facility that is closing and must alter operations to facilitate the facility closure. A CIA also would not be required for a proposed project that results in an emissions decrease (e.g., replacing older equipment with new less polluting equipment).

Additional information regarding types of CPAs and permitting thresholds is available on MassDEP's website at https://www.mass.gov/guides/massdep-air-plan-approval-applications.

3 Public Notice and Involvement of Environmental Justice Populations

310 CMR 7.02(14)(b) requires an applicant to provide advance notice of a proposed project that requires a CIA and provide public involvement opportunities for nearby EJ populations and other interested parties. Providing early notice and community engagement for a proposed project before the CPA is filed ensures that EJ populations can learn about and provide input on the proposed project and contribute local knowledge to inform the CIA.

At least 60 days prior to filing the CPA, the applicant must provide notice of the proposed project and submit a fact sheet to MassDEP, MassDEP's EJ Director, nearby EJ populations, and local officials. The fact sheet should describe the proposed project, identify the EJ populations that may be affected by the proposed project, and include the applicant's contact information for submitting comments or requesting additional information or public involvement activities. The applicant must provide public participation opportunities for nearby EJ populations to seek input on the proposed project and CIA that will be conducted. The regulations also require the applicant to meet with MassDEP after the submittal of the 60-day notice to MassDEP to discuss the proposed project and plans for seeking public input and participation. The applicant may choose to meet with MassDEP more than once, including prior to providing the 60-day notice. 310 CMR 7.02(14)(b) states:

> (b) Public Notice and Involvement.
>
> 1. At least 60 days prior to filing a comprehensive plan application for which a cumulative impact analysis is required pursuant to 310 CMR 7.02(14)(a), the applicant shall provide notice of the proposed project to the following via electronic or regular mail or both, and maintain copies of all such notices:
>
> a. The appropriate Department Regional Office;
> b. The Department's Environmental Justice Director;
> c. The chief executive of the municipality in which the facility or emission unit is or will be located; and
> d. Representatives of nearby environmental justice populations that include organizations and individuals recommended by the Department's Environmental Justice Director and relevant Department Regional Office. The applicant shall contact the Department to obtain the list of organizations and individuals prior to providing the 60-day notice required by 310 CMR 7.02(14)(b)1.
>
> 2. The notice required by 310 CMR 7.02(14)(b)1. shall include a fact sheet using a template provided by the Department that describes the proposed project, nearby environmental justice populations, and applicant contact information for submitting comments or requesting additional information or public involvement activities. The notice and Fact Sheet shall use plain language and be translated into any non-English language spoken by a significant percentage of nearby environmental justice populations.

> 3. After providing the notice required by 310 CMR 7.02(14)(b)1., the applicant shall participate in a meeting with the appropriate Department Regional Office to discuss public outreach and involvement measures and development of the cumulative impact analysis.
>
> 4. After providing the notice required by 310 CMR 7.02(14)(b)1., the applicant shall undertake measures to provide outreach and meaningful public involvement opportunities for nearby environmental justice populations. Such measures may include, but are not limited to, holding one or more community meetings, meeting with existing community-based organizations, creating a project webpage, and disseminating information through social media channels. The Department may require specific measures to ensure meaningful public involvement for environmental justice populations. The public shall be given the opportunity to provide comments to the applicant and the Department on the proposed project during the public involvement opportunities.

3.1 Notice of Proposed Project and Fact Sheet

The 60-day advance notice and Fact Sheet should be sent to:

1. The Air Permit Chief of the MassDEP Regional Office in which the proposed project will be located:
   - Western Regional Office: WERO.air@mass.gov Marc.Simpson@mass.gov
   - Central Regional Office: CERO.air@mass.gov Thomas.Hannah@mass.gov
   - Northeast Regional Office: NERO.air@mass.gov Edward.Braczyk@mass.gov
   - Southeast Regional Office: CERO.air@mass.gov Mark.Poudrier@mass.gov.

   A list of cities and towns in each MassDEP Regional Office is available at https://www.mass.gov/service-details/massdep-regional-offices-by-community
2. MassDEP's EJ Director: Deneen.Simpson@mass.gov
3. Nearby EJ populations that include community-based organizations and individuals recommended by MassDEP's EJ Director and MassDEP Regional Office (see additional details below).
4. The chief executive of the municipality (e.g., Mayor's office, Town Manager's Office, or Select Board) for the municipality in which the proposed project is located. If the proposed project is located near a municipal boundary, MassDEP recommends also notifying local officials in the nearby bordering municipality.

The Fact Sheet should describe the proposed project to help nearby EJ populations and other stakeholders better understand the project and how they can provide input into the CIA and MassDEP's permit application review and decision. In May 2021, MassDEP began requiring a fact sheet for CPAs for projects in or near EJ populations that MassDEP distributes to EJ populations. The CIA regulations require a similar Fact Sheet but require the applicant to distribute the Fact Sheet at least 60 days prior to filing a

CPA. The Fact Sheet should describe the proposed project, potential impacts, and identify nearby EJ populations. See Attachment 1 for a Fact Sheet template.

Prior to providing the required 60-day advance notice and fact sheet, the applicant should contact MassDEP's Regional Office and MassDEP's EJ Director to obtain a list of community-based organizations (CBO), tribes and residents the applicant should contact to provide notice and the Fact Sheet. Applicants also should contact local officials to identify CBOs and residents active in the review of local environmental issues and ask for ideas and recommendations for public involvement activities. The applicant should use this information to:

1. Identify CBOs, tribes, and residents to reach out to;
2. Determine how notice to EJ populations will be provided, which may include local newspapers, online notices (e.g., Town/City webpage and news feed, local CBO webpage), posting notice in Town or City Hall;
3. Identify any non-English languages into which the notice and Fact Sheet will be translated; and
4. Plan public involvement activities.

3.2 Pre-Application Meeting with MassDEP

Prior to conducting the CIA, the applicant must meet with the MassDEP Regional Office to discuss public outreach and involvement measures and development of the CIA. This meeting (which can be via teleconference) should occur after the submittal of the 60-day notice to MassDEP and can be scheduled when the applicant first contacts the MassDEP Regional Office to obtain a list of local EJ population contacts. The applicant may choose to meet with MassDEP more than once, including prior to providing the 60-day notice.

3.3 Public Involvement Opportunities

The applicant must undertake measures to provide meaningful public involvement opportunities for nearby EJ populations regarding the proposed project and CIA being conducted. Meaningful public involvement consists of informing, consulting, and working with nearby EJ populations to solicit their feedback and address their concerns. The specific forms of outreach and involvement should be tailored to the specifics of the proposed project and the nearby EJ populations. Potential public involvement measures include:[1]

1. holding a community meeting, either proactively or upon request;
2. wide dissemination of the Fact Sheet (with translation into relevant languages);

[1] Adapted from the MEPA Public Involvement Protocol for Environmental Justice Populations available at https://www.mass.gov/guides/environmental-justice-protocols-and-resources

3. hosting a project website or making project information available through other similar electronic means;
4. ensuring outreach to the public is communicated in clear, understandable language and in a user-friendly format;
5. engaging in creative outreach by making use of pre-existing groups – such as grassroots organizations and high school groups – and natural areas of congregation – like places of worship, libraries, and farmer's markets – to disseminate information about the proposed project and CIA, as well as traditional locations such as libraries and government offices;
6. use of non-English and/or community-specific media outlets to publicize the proposed project and CIA, including local public broadcasting stations, specialized newspapers, and community newspapers;
7. disseminating information through social media channels;
8. organizing town hall meetings or other focused community meetings organized by topic, neighborhood, or interest group;
9. holding community meetings during weekend or evening hours, at accessible locations near public transportation, and/or through zoom or other similar web-based service if requested or determined to be more effective for reaching EJ populations. In addition, a "hybrid format" could be considered which allows members of the public to join in-person, on Zoom, or by phone, and makes the content of the meeting available afterwards for those who cannot attend;
10. organizing public education efforts for technical aspects of the proposed project, such as fact sheets with visuals that include a summary of the project and associated technologies and processes, using lay-person language and terms in an effort to ensure the community understands the potential impacts of the project and can provide meaningful input, and holding "science fair" type presentations or teach-ins broken by topics;
11. considering door-to-door education efforts through the use of flyers or other canvassing methods;
12. identifying specific neighborhoods, residents or other communities surrounding the project site that may be affected and considering targeted outreach and engagement strategies directed at such areas; and
13. establishing a local information repository that is convenient and accessible for the EJ population where information related to the project can be obtained.

The applicant should make best efforts to provide translation/interpretation services in non-English languages requested by members of the public to the extent necessary to ensure meaningful engagement by such individuals.

Note that 310 CMR 7.02(14)(g)2.a. requires the applicant to include in the CIA Report a description of the notice and public involvement measures conducted, including supporting documentation, and a summary of public comments received and the applicant's written responses to the public comments. Therefore,

the applicant should document actions taken and summarize the key questions and concerns identified during the public involvement process. Questions and concerns raised by the public during the public engagement should be integrated into the assessment of existing community conditions and addressed as applicable in the assessment of cumulative impacts from the proposed project (Section 7.1).

4 Assessment of Existing Community Conditions

310 CMR 7.02(14)(c) requires an applicant to assess existing community conditions in the cumulative impact analysis to characterize existing pollution sources, health vulnerabilities, and other stressors that could be exacerbated by increased air emissions from the proposed project. The regulation includes a list of indicators for the existing conditions to be assessed (see section 4.1). In addition to gathering data on the indicators, the regulation requires the applicant to identify and respond to concerns raised by nearby EJ populations through the public involvement process as follows. 310 CMR 7.02(14)(c) describes the assessment as follows.

> (c) Assessment of Existing Community Conditions
>
> 1. As part of the cumulative impact analysis, the applicant shall assess existing conditions in nearby environmental justice populations by collecting and summarizing data on the environmental, public health, and socioeconomic indicators listed in 310 CMR 7.02(14)(c)4. Table 1, which the Department shall make available on its website.
> 2. In addition to its assessment of indicators in 310 CMR 7.02(14)(c)1., the applicant shall document relevant comments received regarding air quality and public health made by municipal officials, organizations, representatives and residents in nearby environmental justice populations, and other parties during the public involvement opportunities required in 310 CMR 7.02(14)(b).
> 3. The results of the assessment of existing community conditions and indicators shall include information about each indicator listed in Table 1, maps showing indicators in relation to the proposed project location and nearby environmental justice populations, and an overall narrative describing existing community conditions, including public comments documented pursuant to 310 CMR 7.02(14)(c)2., and shall be included in the cumulative impact analysis report required under 310 CMR 7.02(14)(g).

4.1 Overview of Indicators

The applicant should collect and present data on all the indicators listed in 310 CMR 7.02(14) Table 1: Indicators (shown below) for all EJ block groups (or census tracts with EJ block groups) within 1 mile of the proposed project.

Air Quality / Climate data should be at the tract level except for traffic proximity, which should be for each EJ block group. Air Quality / Climate and Health data are required only for EJ block groups within 1 mile (or 5 miles) of the proposed project. Health data should be at the census tract level for all the health indicators except asthma, which should be for each school associated with an EJ block group. Socioeconomic data should be at the block group level. Nearby Sensitive Receptors and Nearby Regulated Facilities within 1 mile of the proposed project should be identified and described, and those within EJ block groups noted. As shown in the examples, certain Indicator data tables should include

statewide averages, percent of state average, and percentile ranks within the state to show how the EJ population compares to the state overall.

310 CMR 7.02(14)(c)4. Table 1: Indicators
AIR QUALITY / CLIMATE
Particulate Matter 2.5 (PM2.5) levels in air in microgram per cubic meter (µg/m^3), annual average and state percentile
Ozone summer seasonal average of daily maximum 8-hour concentration in air in parts per billion (ppb) and state percentile
Traffic proximity by block group and state percentile
Diesel particulate matter level in air in µg/m^3 and state percentile
Air Toxics Cancer Risk per million and state percentile
Air Toxics Respiratory Hazard Index (HI) and state percentile
Impervious Surface percent and state percentile
NEARBY REGULATED FACILITIES
Facilities with DEP air permits
Facilities reporting under the EPA Toxics Release Inventory program
Facilities reporting under the Toxics Use Reduction Act (i.e., Large Quantity Toxic Users)
Hazardous waste treatment, storage and disposal facilities
Solid waste diversion and disposal facilities
Large quantity hazardous waste generators
Wastewater treatment plants
Airports
Freight rail yards
Port facilities
HEALTH
Asthma prevalence in schools per 100 students total both sexes for each individual school (k-8), public and private averaged for the most recent 3 school years available and percent of state rate
Elevated blood lead levels prevalence (rate per 1,000 screened of confirmed blood lead levels above 5 micrograms per deciliter (µg/dL) for ages 9 months to 47 months) averaged for 3 years and percent of state rate
Low birth weight (rate per 1,000 of full-term singleton births ≤ 2500 grams) averaged for 5 years and percent of state rate
Premature deaths per 100,000 before age 75 years averaged for 5 years and percent of state rate
Chronic obstructive pulmonary disease (COPD) among adults aged 18 years or older, crude prevalence (percentage) and percent of state rate
Coronary heart disease among adults aged 18 years or older, crude prevalence (percentage) and percent of state rate

SOCIOECONOMIC
Median household income and percent of state median for each EJ block group
Minority population percent for each EJ block group
English language isolation household percent for each EJ block group
Young (<5 years old) (percent and state percentile)
Older (>65 years old) (percent and state percentile)
NEARBY SENSITIVE RECEPTORS
Schools (k-12)
Long-term care residences
Public housing
Childcare facilities
Prisons

Example

The following sections describe how to collect and present indicator data and includes a hypothetical example based on a hypothetical proposed project located at MassDEP's Central Regional Office at 8 New Bond Street in Worcester. Tables and figures labeled "X." are examples of how applicants could display data in the assessment. Example text is boxed in grey. This example represents a minimal presentation of data and applicants are encouraged to elaborate and expand on the data and descriptive text as appropriate for their proposed project and potentially affected nearby EJ populations.

The example is for a non-major source, and therefore, a 1-mile radius is used to identify nearby EJ populations for the assessment (a 5-mile radius should be used if a proposed project is a major source). Note that the example data in this guidance may not match the data currently available on MassDEP's website because the website data is updated periodically.

4.2 Project Area and Nearby Environmental Justice Populations

The assessment should describe the location of the facility and project area, include a map showing the project location, and include a brief description of the proposed project. If the proposed project is at an existing facility, the assessment should describe the facility, its operations and emission units, current air emissions and how the proposed project will affect existing operations and emissions. If the facility is large, include a facility map showing the location of the proposed project within the facility.

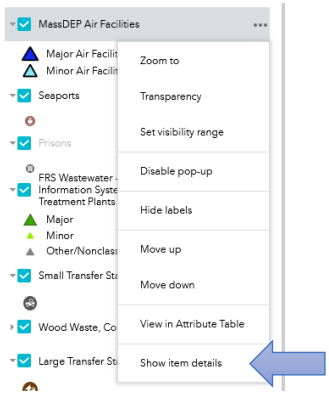
Data Collection

The assessment should include a map showing the EJ block groups within a 1-mile radius around the proposed project and a table of the EJ block group and tract numbers corresponding to the map and the indicator data. Block groups that have less than 5% of their area within the 1-mile radius should be identified (see Table X.1) but do not need to be included in the analysis. MassDEP has developed a CIA mapping tool for identifying EJ block groups that applicants can use to generate the map and table.

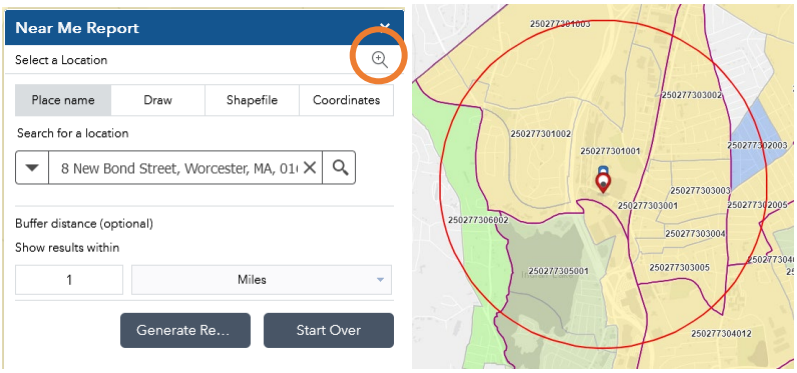
To get the map and EJ block groups:

1. Access the MassDEP CIA Mapping Tool at https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=5a876b759df24d10b4a9e9e5b3921310

2. On the top right of the map click the *Legend* icon to display the *Layers* box. This box allows you to turn layers on or off. For example, if a map becomes too visually crowded, you can turn off some layers to allow you to create separate maps. The ellipsis ••• for each layer provides several features, including the ability to disable the information pop-ups, enable/ disable labels, view the data in the attribute table, and show the source of the data (click *Show item details*). Check the box for USA Census Tracts in the *Layers* box to display tract boundaries on the map.

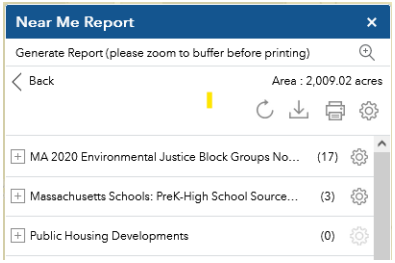


3. Select the *Near Me Report* icon in the lower left part of the screen to display the *Near Me Report* dialog box which contains a search bar. In the *Near Me Report* search bar, enter the facility address, and pick the address out of the list the search provides. The default radius will be 1 mile – this can be changed if needed. A red pin with 1 mile radius circle will be added to the EJ block group map. Click the magnifying glass icon on the Near Me Report box (circled orange below) to zoom to your location. You will see the objects in the data layers needed for the assessment. Note the other options to draw a polygon or import a shape file to define your facility – these are for geographically large facilities. Please contact MassDEP if you have a facility larger than 50 acres to discuss how to indicate the proposed project relative to the overall facility area.

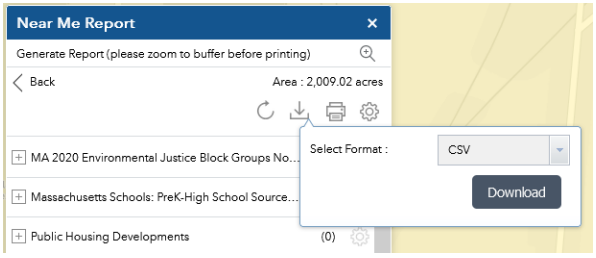


4. Use a screenshot tool to copy and paste the image into the Assessment. See example Figure x.1 below.

5. Click the *Generate Report* button at the bottom of the *Near Me Report* box – a set of icons will appear including one for downloading ( ). You also will see a list of the sensitive receptors and regulated facilities indicator layers with a number in ( ) – this number indicates the number of facilities in that layer that are included in the 1-mile radius.



6. To get a spreadsheet list of the facilities in each layer identified by the 1-mile radius, select the download icon . A *Download* button will appear with a dropdown menu defaulting to CSV. Click the *Download* button to get CSV files with all the sensitive receptors and facilities for your assessment. The download also will include a listing of the EJ block group data and 12-digit block group identifiers (GEOID) for all EJ block groups inside the radius.



The downloads contain the data needed for Tables X.1 and X.2 below. The block group download includes the GEOIDs needed to search MassDEP-provided tables for health and air quality/climate indicator data. You can open the CSV files in a spreadsheet application. Note that Microsoft Excel imports the GEOID as a number in scientific notation – you will need to change the format of the GEOID to number to see all 12 digits. If importing into a database, store the GEOID as a text field.

The download of EJ block groups contains the area of each block group in m^2 (Shape_Area) and the area of each block group within the radius in acres (Intersecting Area). Applicants should convert the units to match and check the percent of the block group area within the radius. Where that area in the radius is less than 5% of the total block group area, applicants should highlight that in the report as shown in Table X.1 below.

Changing the base map to aerial imagery will help identify local land use – click the basemap icon to view base map options. If needed, you can get more detailed local land use data from MassMapper (https://www.mass.gov/info-details/massmapper-interactive-map, layer Physical Resources/Land Use/Land Cover Land Use (2016)).

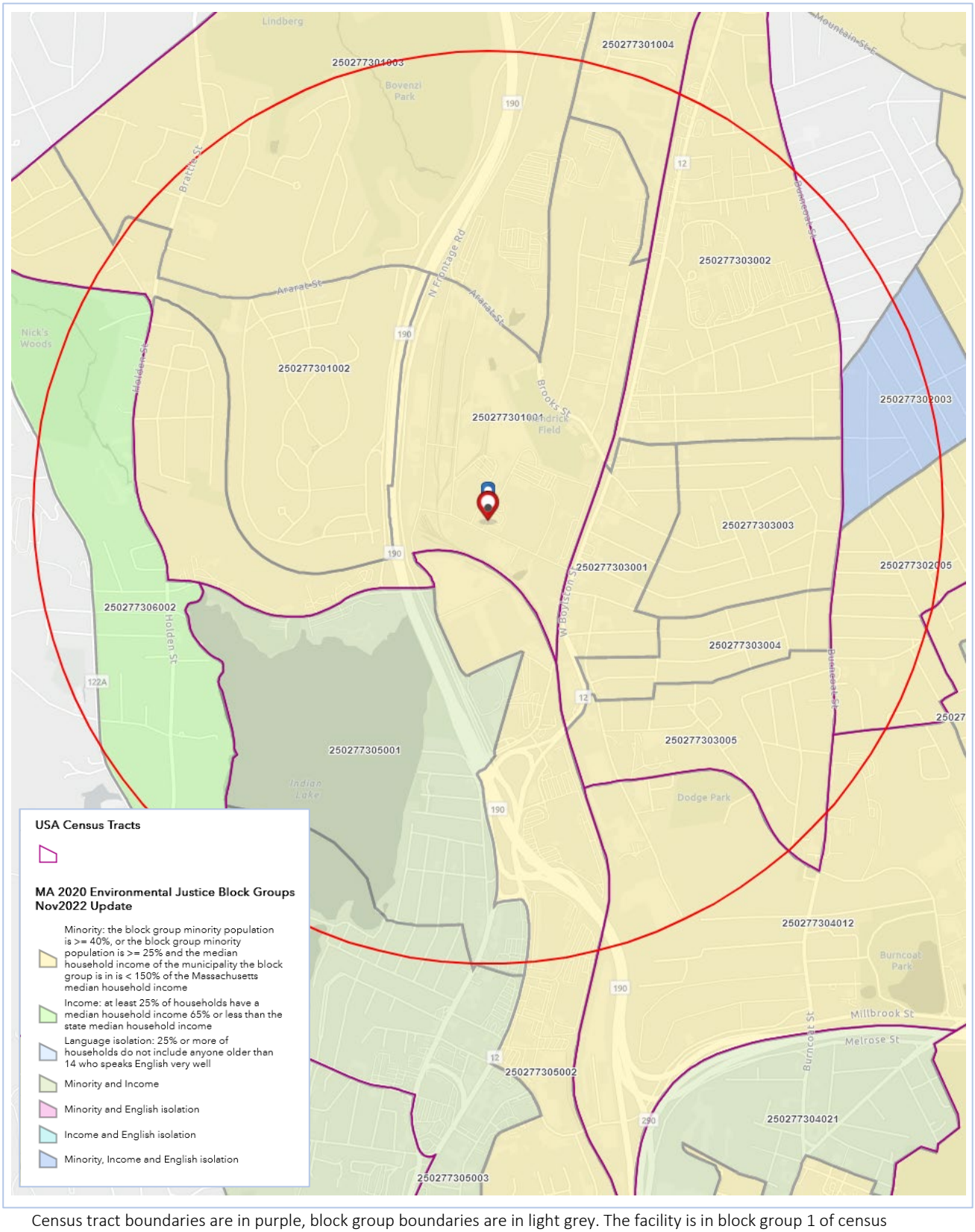
In most cases the address matched map location or other coordinates for the facility will be adequate as the location of the proposed project. However, this may not be the case for proposed projects on large properties. In such cases, applicants should select a location on the map (using the *Coordinates* button) that corresponds to the location of the proposed project rather than the address-matched location, geographic center of the facility, or other commonly used coordinates for the facility as a whole. If a facility or proposed project is larger than 50 acres, has widespread emissions release points, or is best characterized as an area source, contact MassDEP for more instruction on locating the proposed project and 1 mile radius relative to the extent of the entire facility.

Presentation of Information

Below is an example of how the project and EJ information could be presented. Applicants should elaborate for their specific project, facility, and nearby EJ populations.

> **Project Area and Nearby Environmental Justice Populations**
>
> The MassDEP facility is located at 8 New Bond Street in the City of Worcester in central Massachusetts (coordinates: 42.306936, -71.804286). The facility is located just east of Highway 190 and north of downtown Worcester. The proposed project is in an industrial area. A school and ball fields are located north of the facility. Residential housing is located to the east of the facility, and the closest residences are located approximately one-fifth of a mile from the facility.
>
> The 1-mile radius around the facility includes portions of 6 census tracts and 17 block groups, as shown in the Figure X.1 and listed in Table X.1. The facility is in block group 1 of census tract 730100. Block group 1 of 730401 (GEOID 250277304011) has less than 5% of its area within the 1-mile radius and is not included in the analysis.

Figure X.1 Census tracts and EJ block groups within 1 mile radius around the facility



Census tract boundaries are in purple, block group boundaries are in light grey. The facility is in block group 1 of census tract 730100. Note that other layers are off. Source: MassDEP CIA Mapping Tool.

Table X.1 Census tracts and EJ block groups

Tract	Block Group	County	Tract GEOID (11 digits)[2]	EJ Block Group GEOID (12 digits)[2]
730100	1[1]	Worcester (027)	25027730100	250277301001
	2	Worcester (027)		250277301002
	3	Worcester (027)		250277301003
	4	Worcester (027)		250277301004
730200	3	Worcester (027)	25027730200	250277302003
	5	Worcester (027)		250277302005
730300	1	Worcester (027)	25027730300	250277303001
	2	Worcester (027)		250277303002
	3	Worcester (027)		250277303003
	4	Worcester (027)		250277303004
	5	Worcester (027)		250277303005
730401	1[3]	Worcester (027)	25027730401	250277304011
	2	Worcester (027)		250277304012
730500	1	Worcester (027)	25027730500	250277305001
	2	Worcester (027)		250277305002
	3	Worcester (027)		250277305003
730600	2	Worcester (027)	25027730600	250277306002

[1] Facility is in this block group.

[2] GEOID is concatenation of state code + county code + tract + block group. State code for MA is 25. County code for Worcester is 027. Tract is next 5 digits followed by the single digit block group number. Sometimes tract is written without the trailing "0", for example 7301 rather than 730100. GEOID is used for searching databases.

[3] Area of the EJ block group within the 1-mile radius is less than 5% of the total area of the block group.

4.3 EJ Populations and Socioeconomic Conditions

The applicant should include data for each socioeconomic indicator listed in in 310 CMR 7.02(14)(c)(4.) *Table 1: Indicators* for each census block group that is identified as having EJ populations fully or partially located within 1 mile of the proposed project. An exception is where the area of an EJ block group within the 1-mile radius is less than 5% of the total area of that block group – in such cases the applicant should identify such block groups (as in Table X.1) but should not include them in the indicator data tables below.

Data Collection

EJ data is included in the download from the CIA Mapping Tool described in 4.2. For convenience, MassDEP has assembled demographic, health, and pollution indicator data for all EJ block groups and tracts in a file on MassDEP's CIA website at https://www.mass.gov/info-details/cumulative-impact-

analysis-in-air-quality-permitting. Applicants should download the data file and use the 12-digit block group GEOID identified in example Table X.1 to search the *Indictors by Block Group* table for demographic data. The applicant should then present the data as shown in the example table and text below.

Presentation of Information

The applicant should provide: (1) a brief description of the EJ block groups identified including background on how EJ populations are determined; (2) a map showing all EJ block groups within 1 mile of the project; and (3) a table listing the block groups with the socioeconomic and EJ indicator data. Example text, map, and table are shown below.

EJ Populations and Socioeconomic Conditions

The facility is located within an EJ block group. All the block groups within the 1-mile radius of the facility, except small sections of 2 block groups, meet the criteria for EJ populations. There are a total of 17 block groups that meet the criteria for EJ populations partially or fully located within a 1-mile radius of the facility.

The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) used data from the U.S. Census and the U.S. Census Bureau's American Community Survey (ACS) to identify environmental justice populations in Massachusetts. The EEA EJ Policy defines an environmental justice population as a neighborhood where one or more of the following criteria are true:

- the annual median household income is not more than 65% of the statewide annual median household income;
- minorities comprise 40% or more of the population;
- 25% or more of households lack English language proficiency; *or*
- minorities comprise 25% or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150% of the statewide annual median household income.

EEA made the current EJ population determinations based on recently available U.S. Census data for minority, income, and language isolation. See the EEA Environmental Justice Populations webpage for more information at https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts.

Data for EJ block groups including socioeconomic indicators for the most recent time frames available are available in the Cumulative Impact Analysis Mapping Tool (https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=5a876b759df24d10b4a9e9e5b3921310). Data for broader areas and time frames are available from original sources for each indicator as noted in the indicator-specific sections below.

The block groups with EJ populations that are located within a 1-mile radius of the proposed project are listed in Table X.1. Figure X.1 shows EJ block groups located within 1 mile of the proposed project. Table X.2 shows the socioeconomic indicators for each of these EJ block groups. There are three EJ block groups that have approximately 30% of their population over

age 65, compared with the state average of 17%. There are two EJ block groups that have approximately 8% of their population under age 5, compared with the state average of 5%.

Table X.2 Socioeconomic indicators for EJ block groups

Block Group (GEOID)	Population	2020 Median Household Income (MHHI) ($)	Block Group Percent of MA Household Income (%)	Minority (%)	Limited English (% of households)	Percent of Population under 5 (%)	Percent of Population Over 65 (%)	EJ Criteria Met
250277301001[1]	869	$ 104,228	124	40.7	0.0	1.6%	2.1%	Minority
250277301002	1390	$ 76,351	90	34.7	0.0	1.4%	17.0%	Minority
250277301003	2422	$ 79,926	95	39.8	4.6	4.6%	7.5%	Minority
250277301004	1823	$ 60,430	72	37.7	0.0	2.1%	11.1%	Minority
250277302003	761	$ 44,681	53	25.4	38.0	3.1%	11.4%	Minority, income and English isolation
250277302005	1376	$ 68,917	82	26.3	0.0	4.9%	29.4%	Minority
250277303001	975	$ 55,733	66	39.4	7.8	0.0%	5.6%	Minority
250277303002	1544	$ 79,118	94	40.5	9.0	3.5%	8.1%	Minority
250277303003	1146	$ 87,625	104	25.5	4.4	2.1%	10.0%	Minority
250277303004	750	$ 55,682	66	39.1	0.0	0.0%	8.2%	Minority
250277303005	808	$ 87,656	104	31.7	0.0	0.0%	21.8%	Minority
250277304012	1484	$ 87,875	104	32.2	6.3	1.3%	30.7%	Minority
250277305001	928	$ 49,046	58	42.0	0.0	0.0%	7.3%	Minority and income
250277305002	1187	$ 59,375	70	70.5	21.0	7.6%	0.0%	Minority
250277305003	2051	$ 44,125	52	41.8	6.1	8.1%	7.1%	Minority and income
250277306002	1019	$ 17,179	20	21.7	0.0	0.0%	33.7%	Income
State Average		$84,384		32%	6%	5%	17%	

Source: Massachusetts EEA EJ Block Groups Nov 2022; 2020 EJ Populations include data from 2020 Census and American Community Survey, 2016-2020.

Sources for state values are American Community Survey, 2020: ACS 5-Year Estimates Detailed Tables: B19013 MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2020 INFLATION-ADJUSTED DOLLARS), B02001RACE, and B16001LANGUAGE SPOKEN AT HOME BY ABILITY TO SPEAK ENGLISH FOR THE POPULATION 5 YEARS AND OVER, and for Massachusetts percent of population under 5 years of age and over 65 years is 5% and 17%, respectively: EJScreen Standard Report, EJScreen Report (Version 2.1)

Notes:

[1] Proposed project is located in this block group.

4.4 Health Conditions

The applicant should present data on the health indicators shown in 310 CMR 7.02(14)(c)4. Table 1 for census tracts with EJ block groups. In the example, EJ block groups within a 1-mile radius are in six census tracts. Therefore, the health data should be obtained and presented for all six census tracts, except for school asthma prevalence, which is presented by individual school.

Data Collection

For convenience, MassDEP has assembled health indicators data for census tracts and schools in a spreadsheet available on MassDEP's cumulative impact analysis website (https://www.mass.gov/info-details/cumulative-impact-analysis-in-air-quality-permitting). Applicants should download the file and use the 11-digit tract numbers for tracts with EJ block groups as identified in Section 4.1 to search the table of indicators by tract for the relevant health data.

For schools, applicants should use the 12-digit block group numbers identified in Section 4.2 to search the Block Group-Schools table for each EJ block group. This search will give the schools associated with each EJ block group. Some schools will be repeated in this table, but they only need to appear once in the health indicators portion of the assessment. Applicants should take the list of schools and search by School Code in the Pediatric Asthma by School table for the asthma data for the list of specific schools that will be included in the assessment. Where a school associated with an EJ block group has an asthma rate above the state average, the applicant should investigate whether the enrollment area for that school is within the 1-mile radius of the proposed project. Schools within 1 mile of the facility that serve students that do not reside within 1 mile, such as a charter or private school, should be included in the table with a notation about student population served.

Presentation of Information

The applicant should present each of the health indicators as shown in the example tables X.3 and X.4 below. The tables should include the health rates for each census tract for all census tracts that include EJ populations within the 1-mile radius of the proposed project, and the rates for the state overall. The schools table should include all schools in or near EJ block groups as provided in the MassDEP *Block Group-Schools* table listed in order of distance from the proposed facility. In addition, applicants should describe the health conditions that exist in the areas near the proposed project. Example language is shown below.

> **Health Conditions**
>
> Health indicators are available from the MassDEP cumulative impact analysis website (https://www.mass.gov/info-details/cumulative-impact-analysis-in-air-quality-permitting) for EJ block groups and the most recent time frames useful for CIA reports.. Data for broader areas and time frames are available from original sources as noted below for each indicator.
>
> The EEA 2021 Environmental Justice Policy includes criteria for identifying Vulnerable Health EJ Populations, including asthma (pediatric emergency department visits), heart attack (hospitalizations), elevated blood lead, and low birth weight. Data for some of the criteria in the

Policy are not available at the neighborhood (census tract) level. Because DPH heart attack hospitalization data is not available at the neighborhood (census tract) level, this assessment provides modeled estimates of coronary heart disease from the Center for Disease Control (CDC). Because DPH asthma emergency department data is not available at the neighborhood (census tract) level, this assessment provides DPH school asthma prevalence. This assessment also includes as neighborhood-level health indicators CDC estimates of chronic obstructive pulmonary disease (COPD) and DPH data on premature mortality (death before the age of 75). COPD makes individuals more vulnerable to air pollutants. Premature mortality rates represent the cumulative burden of multiple stressors throughout life, which can result in death at a younger age. The risk of death also has been linked to increases in air pollution. Low birth weight and elevated blood lead levels in this assessment are consistent with the health criteria in the EEA EJ Policy, except that blood lead levels are reported for the past 3 years rather than 5 years. The shorter 3-year average more accurately represents current levels because blood lead levels have been decreasing over time.

Table X.3 shows the health indicator data for census tracts within 1 mile of the proposed project. Table X.4 shows pediatric asthma for schools in or serving children in EJ block groups within 1 mile of the proposed project.

Table X.3 Health indicator data for census tracts that contain EJ block groups

Health Indicator	Census Tract GEOID	Census tract rate	State rate	Percent of state rate*
Low birth weight (per 100 live singleton births)	25027730100	3.17	2.17	**146%**
	25027730200	2.02	2.17	93%
	25027730300	NS	2.17	NA
	25027730401	3.15	2.17	**145%**
	25027730500	3.02	2.17	**139%**
	25027730600	2.11	2.17	97%
COPD (%)	25027730100	4.8	4.5	**107%**
	25027730200	5.6	4.5	**124%**
	25027730300	6.1	4.5	**136%**
	25027730401	7.9	4.5	**176%**
	25027730500	6.0	4.5	**133%**
	25027730600	4.8	4.5	**107%**
Coronary heart disease (%)	25027730100	5.0	3.6	**139%**
	25027730200	6.0	3.6	**167%**
	25027730300	5.8	3.6	**161%**

Health Indicator	Census Tract GEOID	Census tract rate	State rate	Percent of state rate*
	25027730401	7.8	3.6	**217%**
	25027730500	5.1	3.6	**142%**
	25027730600	5.2	3.6	**144%**
Elevated blood lead levels (per 1000 screened)	25027730100	NS**	13.06	NA
	25027730200	NS	13.06	NA
	25027730300	NS	13.06	NA
	25027730401	NS	13.06	NA
	25027730500	NS	13.06	NA
	25027730600	NS**	13.06	NA
Premature Mortality (PMR) (per 100,000 residents)	25027730100	263.2	357.2	74%
	25027730200	275.6	357.2	77%
	25027730300	419.9	357.2	**118%**
	25027730401	370.1	357.2	**104%**
	25027730500	416.3	357.2	**117%**
	25027730600	215.3	357.2	60%

* Bolded values are higher than the state rate.

** Elevated blood lead rates for some census tracts are unavailable because they are suppressed by DPH for confidentiality.

Source: MDPH (low birth weight, elevated blood lead, premature mortality) and CDC Places (COPD and coronary heart disease).

Table X.4 Pediatric asthma prevalence for k-8 schools

School Name	Street Number	Street Name	Community Name	Distance from Project (miles)	Average Enrollment Count	In EJ Block Group or Nearby*	Prevalence Per 100 students (%)	Percent of State Rate (MA rate = 12.2%)
Abby Kelley Foster Charter Public School	10	New Bond Street	Worcester	adjacent	1076.3	In**	6.6	54%
Thorndyke Road School	30	Thorndyke Rd	Worcester	0.6	366.7	in	20.2	**165%**
Bancroft School (private)	110	Shore Drive	Worcester	0.6	~400	in		
Burncoat Middle School	135	Burncoat Street	Worcester	1.1	559.7	in	19.1	**156%**
Nelson Place School	35	Nelson Pl	Worcester	1.2	469.3	nearby	14.1	**115%**
Burncoat Street School	526	Burncoat Street	Worcester	1.2	233.7	in	28.5	**233%**
Wawecus Road School	20	Wawecus Rd	Worcester	1.3	148	in	10.6	87%
Forest Grove Middle School	495	Grove Street	Worcester	1.3	971	in	9.2	75%
Norrback Avenue School	44	Malden Street	Worcester	1.5	524.7	in	18.9	**154%**
Worcester Arts Magnet School	315	St Nicholas Avenue	Worcester	1.5	378.3	nearby**	8.7	71%
Clark St Community School	280	Clark Street	Worcester	1.6	230.3	nearby	21.7	**177%**

School Name	Street Number	Street Name	Community Name	Distance from Project (miles)	Average Enrollment Count	In EJ Block Group or Nearby*	Prevalence Per 100 students (%)	Percent of State Rate (MA rate = 12.2%)
Francis J McGrath Elementary	493	Grove Street	Worcester	1.6	254	distant	9.3	76%
Lincoln Street School	549	Lincoln Street	Worcester	1.9	263.3	distant	30.6	**250%**
Belmont Street Community	170	Belmont Street	Worcester	2.5	512	distant	7.3	60%
City View	80	Prospect Street	Worcester	2.5	477.3	distant	5	41%
Elm Park Community	23	North Ashland Street	Worcester	2.6	459	distant	21.9	**179%**

Bolded values are higher than the state rate.

* Labeled "in" if school is within an EJ block group that is within 1 mile from the proposed project. Labeled "nearby" if school is near an EJ block group that is within 1 mile. Schools may be within an EJ block group that is not within 1 mile of the proposed project; such schools are labeled "nearby." Schools that are more than 1.5 miles from the facility are labeled as "distant." The "distant" schools are included in the list because they are within ½ mile of an EJ block group that is partly within the 1-mile radius of the proposed project.

** Private schools and charter schools tend to draw students from a wider area and so are not likely to reflect asthma prevalence in the communities near the facility.

Low birth weight

Table X.3 shows that three census tracts have low birth weight rates higher than the state low birth weight rate and two census tracts have rates just below the state rate. The data for one tract is suppressed by DPH for confidentiality.

DPH uses low birth weight to identify vulnerable health EJ populations because exposure to environmental contaminants can increase the risk of delivering a low birth-weight baby and low birth weight is a significant predictor of maternal and infant health. Low birth weight can increase the risk of infant mortality and morbidity, health problems throughout childhood, cognitive disorders, developmental delay, and chronic diseases as an adult such as cardiovascular diseases and type 2 diabetes. Air pollution exposure during pregnancy is associated with adverse birth outcomes and can increase the risk of low birth weight. Environmental contamination tends to be higher in low-income communities and communities of color, and women of color or with low income have a higher risk of delivering low birth-weight babies.

Low birth weight is measured as the rate per 100 full-term singleton births less than or equal to 2500 grams, averaged for 5 years. Data for low birth weight is available from the DPH Environmental Justice Tool (https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html) and are available on MassDEP's CIA website.

Chronic Obstructive Pulmonary Disease (COPD)

Table X.3 shows that all six census tracts have COPD rates higher than the state rate.

COPD can be caused by exposure to lung irritants including air pollution, cigarette smoke, dust, and chemical fumes. Air pollution can exacerbate symptoms in individuals with COPD and lead to increases in respiratory morbidity and mortality. Communities of color or with lower socioeconomic status bear a disproportionate burden of COPD. Environmental air pollution exposure, tobacco use, and occupational exposure to lung irritants are more common in lower socioeconomic status neighborhoods making them more susceptible to developing COPD as well as experiencing worsened COPD-related health outcomes.

COPD among adults aged 18 years or older is measured as the crude prevalence (percentage). Data for COPD are available from the Centers for Disease Control and Prevention PLACES website (https://www.cdc.gov/places/index.html).

Coronary heart disease

Table X.3 shows that coronary heart disease prevalence in all six census tracts is higher than the state rate, with one tract more than twice the state rate.

Coronary heart disease is the leading cause of death in the United States. Exposure to air pollutants may increase the risk of a heart attack and increase the risk of cardiovascular mortality following a heart attack. Long-term exposure to air pollutants may lead to premature death for people who have previously had a heart attack. The elderly, people with pre-existing cardiovascular conditions, and those living in poorer communities are especially at risk of heart attacks. Individuals living in lower socioeconomic status neighborhoods are more likely to

experience negative outcomes following a heart attack, such as death or major bleeding, and may receive a lower quality of care following discharge from the hospital.

Coronary heart disease among adults aged 18 years or older is measured as the crude prevalence (percentage). Data for coronary heart disease are available from the Centers for Disease Control and Prevention PLACES website (https://www.cdc.gov/places/index.html).

Elevated blood lead levels

Table X.3 shows that elevated blood lead rates for all census tracts are unavailable because they are suppressed by DPH for confidentiality.

DPH uses childhood lead exposure to identify vulnerable health EJ populations because lead exposure disproportionately impacts lower income communities and communities of color. Childhood exposure to relatively low levels can cause severe and irreversible health effects, including damage to a child's mental and physical development. Children living in low-income communities are more likely to have elevated blood lead levels than those living in high-income communities, and children of color are more likely to have lead poisoning.

Elevated blood lead levels are measured as the rate per 1,000 cases screened confirmed blood lead levels above 5 micrograms per deciliter (µg/dL) for ages 9–47 months, averaged for 3 years. Data for 3-year elevated blood lead levels calculated by DPH are available from MassDEP's CIA website and for individual years from the DPH Massachusetts Environmental Public Health Tracking system (https://matracking.ehs.state.ma.us/index.html).

Premature mortality

Table X.3 shows that premature mortality in three census tracts is above the state rate, with one tract almost twice the state rate, and three census tracts are below or near the state rate.

Premature death (mortality) represents the overall health of a community and can also reflect community-related stressors and existing exposures to air pollution. Higher mortality among minorities has been attributed to exposure to chronic stress, which can be caused by a number of social factors including exposure to institutionalized racism, neighborhood violence, and substandard housing. The relationship between exposure to air pollution and mortality has been established in multiple studies.

Premature mortality is measured as deaths per 100,000 residents before age 75 years averaged for 5 years. Data for premature mortality are from the Massachusetts Registry of Vital Records and Statistics and are available on MassDEP's CIA website.

Pediatric asthma

Table X.4 shows that 7 schools serve students living within 1 mile of proposed project. Asthma prevalence in 4 of these schools is higher than the state rate. There is a private school and a charter school near the proposed project; however, these schools would tend to draw students from a wider area and so are not likely to reflect asthma prevalence in the communities near the proposed project.

DPH uses pediatric asthma to identify vulnerable health EJ populations because people of color and low-income individuals are at greater risk for asthma exacerbations due to increased exposure to asthma triggers. Uncontrolled asthma can impact an individual's overall health and wellbeing. For example, uncontrolled asthma can reduce activity levels, negatively impact cardiovascular fitness, and increase school absenteeism. The causes of asthma are not well understood, but research has established that exposure to air pollution can trigger asthma symptoms. People with asthma are more sensitive to air pollution than people who do not have asthma. School age children with asthma are particularly susceptible to air pollution due to underdeveloped respiratory and immune systems and increased time spent outdoors. Children are more likely to be hospitalized for asthma in response to air pollution exposure.

Pediatric asthma is measured as the asthma prevalence in schools per 100 students for each individual school (K-8), public and private, averaged for the most recent 3 school years available. Pediatric asthma data is available from the MassDEP cumulative impact analysis website and, for individual years, from the DPH MEPHT tool (https://matracking.ehs.state.ma.us/Health-Data/index.html).

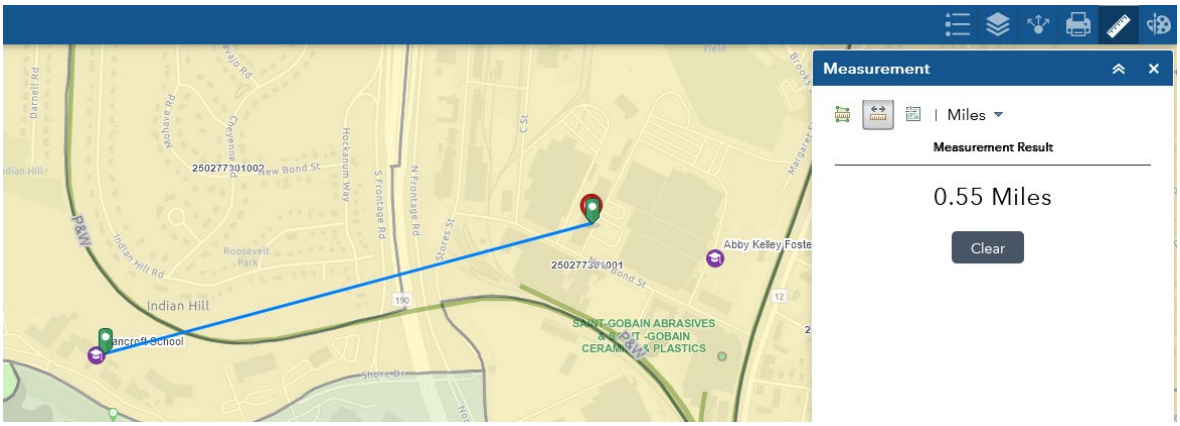
4.5 Sensitive Receptors

The applicant should list and describe the following sensitive receptors within 1 mile of the proposed project noting which sensitive receptors are in EJ block groups. These are all included in the MassDEP CIA Mapping Tool.

- Schools (k-12)
- Long-term care residences
- Public housing
- Prisons
- Childcare facilities

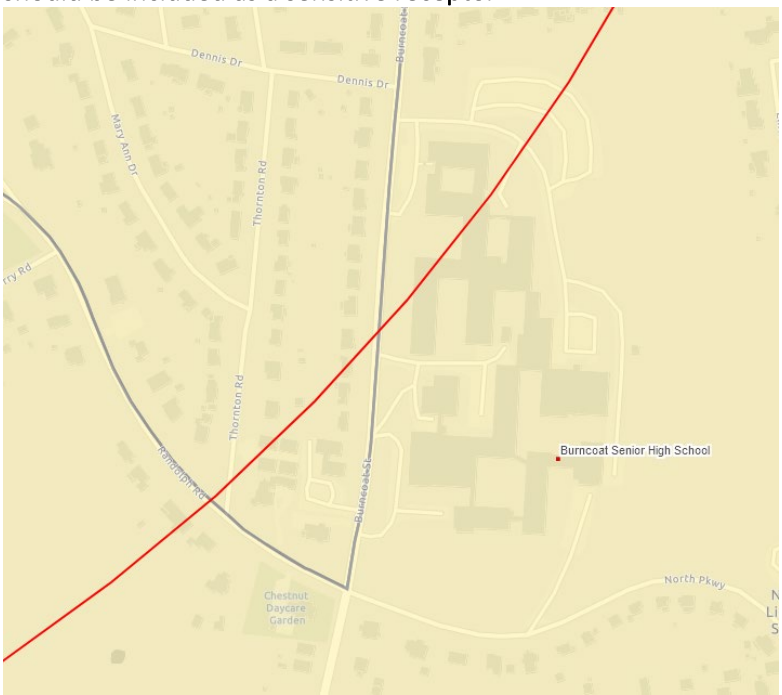
Determining Distances

The Cumulative Impact Analysis Mapping Tool described in Sect 4.1 includes a measurement widget for measuring distances on the upper right of the screen  . Open this widget and click the Distance icon  . Then click on your facility marker and drag the measuring line to the location of the nearest sensitive receptor or other facility you need to locate. The widget will display the distance in miles by default, but you can choose the dropdown menu to change to other units. The screenshot below shows the nearest school to the example facility.



There will be situations where sensitive receptors are partially within the 1-mile radius of the proposed project. In such cases, the sensitive receptor should be included in the report if the radius intersects the sensitive receptor property (even if it does not include the map pin for the receptor). Applicants should examine the boundaries of their radius closely to avoid missing a receptor. Applicants should consult MassDEP in advance where there is a question about where to locate the center of the 1-mile radius or whether a potential receptor intersects the radius. See example below for large middle/high school in relation to the example proposed project at 8 New Bond Street. The highlighted area is a single campus partially in the 1-mile radius containing 2 schools. In this situation data for both schools should be included in the assessment. Applicants should review the boundary of their 1-mile radius for such facilities.

Figure 1 Example of school (Burncoat Senior High School) located on the 1-mile radius boundary that should be included as a sensitive receptor



Data Collection

Applicants should use the MassDEP CIA Mapping Tool to download lists of facilities in each of these categories as described in Sect. 4.2. Note that the capacity of childcare centers is in the POPULATION field.

Presentation of Information

The applicant should include a description of sensitive receptors within a 1-mile radius of the proposed project. The remainder of this section provides an example of how this information should be presented.

Sensitive Receptors

Sensitive receptors include schools, long-term care facilities, prisons, public and subsidized housing, and childcare centers. Sensitive receptors are places individuals congregate or reside who are potentially sensitive to the adverse effects of exposure of air pollution. Sensitive receptors within 1 mile of the proposed project are listed in Table X.5 and shown on Figures X.2 and X.3.

Sensitive receptor location data are available on the MassDEP Cumulative Impact Analysis Mapping Tool. Original sources are noted below for each indicator.

Schools

There are 5 schools within 1 mile of the proposed project as shown in Table X.5 and Figure X.2. The closest school is adjacent to the proposed project: the Abby Kelley Foster Charter Public School, which includes grades Kindergarten through 12th grade. The other schools within the 1-mile radius are located more than a half mile from the proposed project. The Burncoat Middle/High School complex is on the border of the 1-mile radius to the southeast and it is represented by a single pin on the map located outside of the radius. This is the reason for the discrepancy between Table 4 showing five rows and Figure 3 showing only 3 pins. Burncoat Senior High School and Burncoat Middle School are adjacent to one another on the same property and so are represented by just one pin on the map. That pin is outside of the radius even though much of the school complex is within 1 mile of the proposed project. Schools data is provided by EEA based on the Massachusetts Department of Elementary and Secondary Education (DESE) school profiles database.

Long-term care residences

There are 5 long-term care residences within 1 mile of the proposed project as shown in in Table X.5 and Figure X.2. All are over ½ mile from the facility. Data on nursing homes and rest homes was provided by the DPH Division of Health Care Quality (DHCQ) and assisted living facilities information was provided by the Massachusetts Executive Office of Elder Affairs (EOEA).

Public and subsidized housing

There is one subsidized housing building with 70 units within 1 mile of the proposed project as shown in Table X.5 and Figure X.3. This building is Colony Retirement Homes which is approximately 0.9 miles west of the facility across Highway 190, at 123 Holden St, Worcester, MA

01606. The subsidized and public housing data is from the U.S. Department of Housing and Urban Development (HUD).

Childcare Centers

There are 4 childcare centers within 1 mile of the proposed project as shown in Table X.5 and Figure X.3. The closest childcare facility is ABC Child Care Bilingual Program located approximately 0.4 mile north of the proposed project. Of the 4 childcare centers 3 are in EJ block groups.

Prisons

There are no prisons within 1 mile of the facility. Worcester County Corrections is about 2 miles away from the facility. The prisons data is from the Department of Criminal Justice Information Services (DCJIS) (https://www.mass.gov/orgs/department-of-criminal-justice-information-services) (the state agency responsible for maintaining the Commonwealth's criminal justice information system), part of the Massachusetts Executive Office of Public Safety and Security (EOPSS) (https://www.mass.gov/orgs/executive-office-of-public-safety-and-security).

Table X.5 Sensitive Receptors

Category	School Name	Address	In EJ Block Group	Details
School (k-12)[1]	Abby Kelley Foster Charter Public School	10 New Bond Street, Worcester, MA 01606	Yes	K–12 Charter Average enrollment 1076 Adjacent to the facility
	Bancroft School	110 Shore Drive, Worcester, MA 01606	Yes	K–12 Private Average enrollment ~400
	Thorndyke Road School	30 Thorndyke Road, Worcester, MA 01606	Yes	K–6 Public Elementary Average enrollment 367
	Burncoat Senior High School	179 Burncoat Street, Worcester, MA 01606	Yes	9–12 Public Secondary Average enrollment
	Burncoat Middle School	135 Burncoat Street, Worcester, MA 01606	Yes	7–8 Public Secondary Average enrollment 560
Long-term Care Residence[2]	Odd Fellows Home of Massachusetts	104 Randolph Road, Worcester, MA 01606	Yes	Nursing Home
	Oasis at Dodge Park	102 Randolph Road, Worcester, MA 01606	Yes	Rest Home
	Dodge Park Rest Home, Inc.	101 Randolph Road, Worcester, MA 01606	Yes	Rest Home
	Holy Trinity Nursing & Rehabilitation Center	300 Barber Avenue, Worcester, MA 01606	Yes	Nursing Home
	Winter Hill Rest Home	24 Chester Street	Yes	Rest Home
Public and Subsidized Housing[3]	Colony Retirement Homes	123 Holden St, Worcester, MA 01606	Yes	70 units

Category	School Name	Address	In EJ Block Group	Details
Childcare Centers[4]	ABC Child Care Bilingual Program	15 Ararat St., Worcester, MA 01606	Yes	Capacity 74
	Little Ones Child Care	751 Grove St., Worcester, MA 01605	No	Capacity 154
	Greendale YMCA Wee Wuns / School's Out Program	75 SHORE DR Worcester, MA, 01605-3116	Yes	Capacity 150
	Quinsigamond Children's School	670 W BOYLSTON ST Worcester, MA 01606-2064	Yes	Capacity 39
Prisons	none			

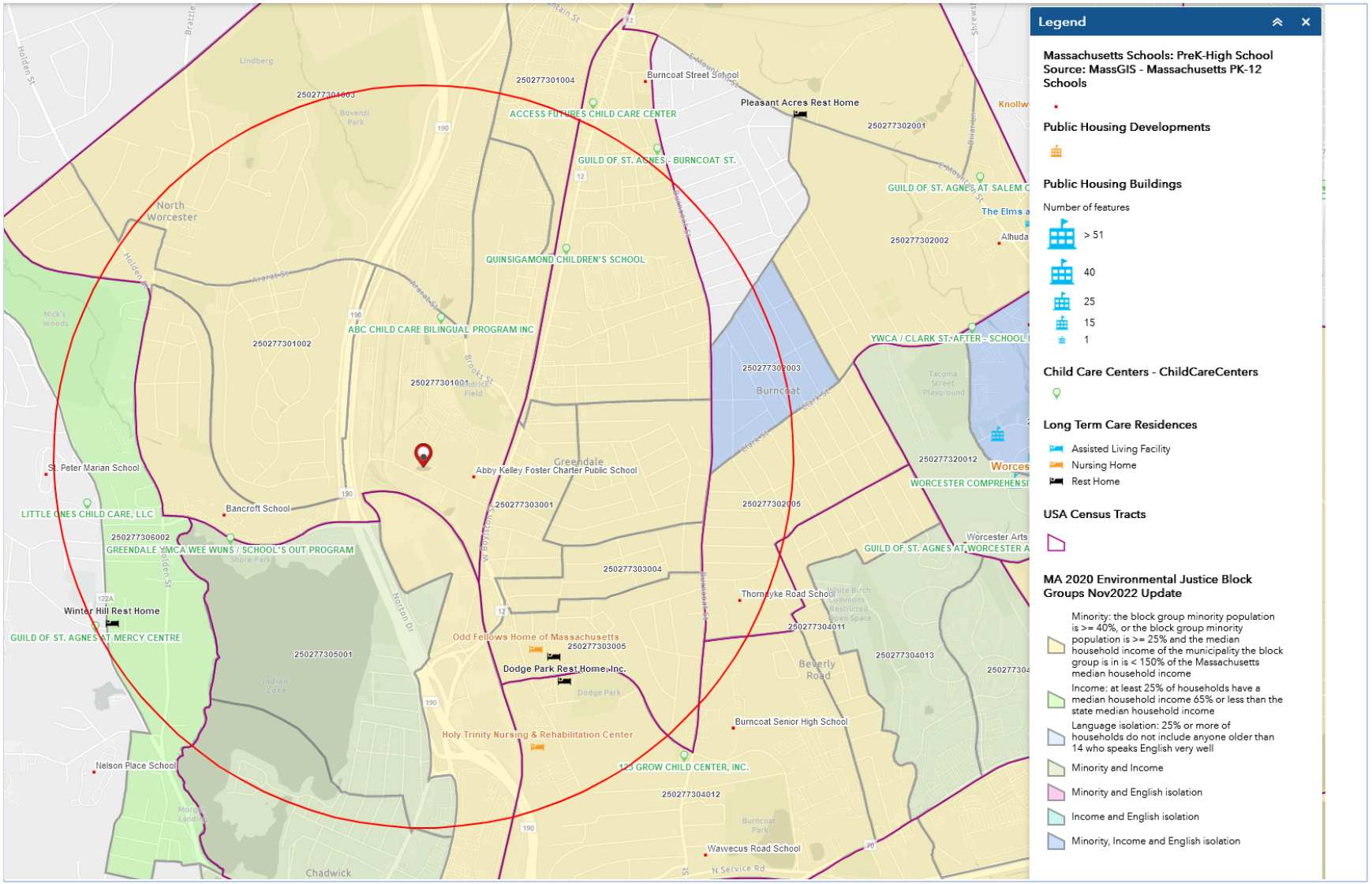
[1] Source: Massachusetts Department of Elementary and Secondary Education (DESE) school profiles database provided by EEA

[2] Source: Massachusetts DPH and Massachusetts Executive Office of Elder Affairs (EOEA)

[3] Source: U.S. Department of Housing and Urban Development (HUD)

[4] Source: Homeland Infrastructure Foundation-Level Data (HIFLD), provided by Oak Ridge National Laboratory (ORNL)

Figure X.2 Schools (k-12), Childcare Centers, Long-term Care Residences, Public/Subsidized Housing



Note: The proposed project is the red pin.

Sources: MassDEP CIA Mapping Tool. For data sources see Table X.3

4.6 Air Quality / Climate Indicators

The Applicant should collect and present the air quality / climate data as described in this section.

Data Collection

For convenience, MassDEP has assembled EJ population, demographic, health, and pollution indicator data for all EJ block groups and tracts in a file on MassDEP's CIA website.

Applicants should download the data file and use the 12-digit block group GEOIDs and 11-digit tract GEOIDs identified in example Table X.1 to search the *Indicators by Tract* and *Indicators by Block Group* sheets for the air quality / climate indicator data required in 310 CMR 7.02(14)(c)4. Table 1. All the air quality / climate indicator data are at the tract level except for traffic proximity, which is at the block group level. The applicant should present the data as shown in the example table and text below. Note that only the data for EJ block groups within 1 mile and for tracts with EJ block groups within 1 mile are required for the assessment.

Presentation of Information

The applicant should include a table similar to Table X.6 with the air quality and impervious surface data presented for each census tract that includes an EJ block group, and traffic proximity presented for each EJ block group. The remainder of this section provides an example of how this information should be described in the assessment using the 8 New Bond Street facility example.

> ### Air Quality / Climate Indicators
>
> This section presents air quality / climate indicators for the EJ block groups and census tracts with EJ block groups within 1 mile of the facility. Table X.6 provides the indicator values and statewide averages for MA. It includes percent of MA average and MA percentile rankings (0 - 100 percentile rank) for comparison to other tracts or block groups in the state.
>
> Air quality / climate indicator data are available from the MassDEP Cumulative Impact Analysis Mapping Tool for EJ block groups. Data for broader areas and time frames are available from original sources as noted below for each indicator.
>
> The source of the air quality indicator data is EPA's EJScreen () and AirToxScreen. EJScreen is an on-line data analysis tool that provides air quality indicator data for census tracts and block groups throughout the country. AirToxScreen (https://www.epa.gov/AirToxScreen) is EPA's Air Toxics Screening Assessment which is based on EPA's National Emissions Inventory (https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei). The source for impervious surface data is EEA and MassDEP GIS calculations from 2016 USDA National Agricultural Imagery Program aerial multispectral imagery.

Table X.6. Air quality and impervious surface for census tracts with EJ block groups

Indicator (units)	Tract or Block Group GEOID	Indicator Value	MA Avg Value	Percent of MA Value	Percentile in MA
$PM_{2.5}$ ($\mu g/m^3$)[1]	25027730100	6.24	6.79	92%	22
	25027730200	6.29	6.79	93%	24
	25027730300	6.29	6.79	93%	24
	25027730401	6.34	6.79	93%	27
	25027730500	6.31	6.79	93%	25
	25027730600	6.26	6.79	92%	23
Ozone (ppb)[1]	25027730100	39.3	39.5	99%	49
	25027730200	39.3	39.5	100%	49
	25027730300	39.4	39.5	100%	51
	25027730401	39.4	39.5	100%	52
	25027730500	39.4	39.5	100%	53
	25027730600	39.4	39.5	100%	52
Diesel PM ($\mu g/m^3$)[2]	25027730100	0.17	0.26	60%	26
	25027730200	0.19	0.26	65%	32
	25027730300	0.20	0.26	70%	37
	25027730401	0.22	0.26	76%	44
	25027730500	0.23	0.26	80%	48
	25027730600	0.17	0.26	63%	29
Air Toxics Cancer Risk (risk per million)[2]	25027730100	19.8	21.6	92%	27
	25027730200	20.1	21.6	93%	29
	25027730300	20.3	21.6	94%	31
	25027730401	20.3	21.6	94%	30
	25027730500	20.1	21.6	93%	30
	25027730600	19.6	21.6	91%	25
Air Toxics Respiratory Hazard Index[2]	25027730100	0.22	0.25	87%	27
	25027730200	0.23	0.25	89%	31
	25027730300	0.24	0.25	96%	45
	25027730401	0.23	0.25	90%	32
	25027730500	0.24	0.25	92%	39
	25027730600	0.22	0.25	86%	25

Indicator (units)	Tract or Block Group GEOID	Indicator Value	MA Avg Value	Percent of MA Value	Percentile in MA
Traffic Proximity (average daily traffic count/ distance to road)[2]	250277301001	1092	2400	46%	83
	250277301002	3486	2400	**145%**	**95**
	250277301003	2946	2400	**123%**	94
	250277301004	3188	2400	**133%**	**95**
	250277302003	215	2400	9%	48
	250277302005	329	2400	14%	57
	250277303001	1285	2400	54%	85
	250277303002	922	2400	38%	80
	250277303003	423	2400	18%	63
	250277303004	926	2400	39%	80
	250277303005	730	2400	30%	75
	250277304012	9447	2400	**394%**	**99**
	250277305001	11881	2400	**495%**	**99**
	250277305002	14483	2400	**603%**	**99**
	250277305003	4919	2400	**205%**	**97**
	250277306002	637	2400	27%	72
Percent Impervious Surface[3]	25027730100	36%	35%	**104%**	59
	25027730200	26%	35%	74%	46
	25027730300	47%	35%	**135%**	67
	25027730401	39%	35%	**111%**	61
	25027730500	47%	35%	**135%**	67
	25027730600	28%	35%	80%	49

Sources:

[1] EJScreen,Data year 2018

[2] AirToxScreen, data year 2019

[3] Massachusetts MassDEP GIS analysis of 2016 USDA National Agricultural Imagery Program aerial multispectral imagery data year 2016

*Bolded values are higher than the state rate, or equal to or greater than the 95th percentile.

Particulate Matter ($PM_{2.5}$)

Table X.6 shows that estimated $PM_{2.5}$ levels are between 6.24 and 6.34 µg/m^3 in the EJ census tracts that are within 1 mile of the proposed project and below the statewide average of 6.78 µg/m^3. The state percentiles range from 22 to 27. These percentiles do not indicate elevated $PM_{2.5}$ levels in nearby EJ populations relative to other parts of the state.

The links between $PM_{2.5}$ exposure and physical health are well established. Exposure to PM is associated with low birth weight in infants, exacerbation of asthma, aggravated lung disease, reduced lung function, premature death in people with heart or lung disease, development of acute and chronic bronchitis, increased susceptibility to respiratory infection, and heart attacks.

EJScreen estimates $PM_{2.5}$ levels based on monitoring data from the US EPA's Office of Air and Radiation. EJScreen reports the annual average $PM_{2.5}$ concentrations in micrograms per cubic meter ($\mu g/m^3$).

Ozone levels in air

Table X.6 shows that estimated ozone levels are very close to the statewide average of 39.5 ppb. The state percentiles range from 49 to 53. These percentiles do not indicate elevated ozone levels in nearby EJ populations relative to other parts of the state.

Exposure to ozone is associated with respiratory health effects, including coughing and throat irritation, difficulty breathing, inflammation and damage in the airways, increased susceptibility to lung infections, aggravated lung diseases, increased emergency department visits, and asthma exacerbation.

EJScreen estimates ozone levels based on monitoring data from EPA's Office of Air and Radiation. EJScreen reports the average of daily maximum 8-hour-average ozone concentrations in parts per billion (ppb) for the May through September ozone season.

Diesel PM levels in air

Table X.6 shows that estimated Diesel PM levels are between 0.17 and 0.23 $\mu g/m^3$ in the EJ census tracts that are within 1 mile of the proposed project, which is near to but still lower than the statewide average of 0.25 $\mu g/m^3$. The state percentiles range from 26 to 48. These percentiles do not indicate elevated diesel PM levels in nearby EJ populations relative to other parts of the state.

Exposure to diesel PM can lead to worsening asthma and emphysema-related symptoms and cardiovascular effects including coronary vasoconstriction and premature death from cardiovascular disease. Diesel exhaust can cause increases in blood pressure and other potential triggers of heart attack and stroke in healthy adults. Children and those with existing respiratory disease are especially susceptible to the harmful effects of PM from diesel exhaust, which can lead to increased asthma symptoms and attacks along with decreases in lung function. In children living near roadways, diesel exposure also may lead to reduced lung function.

EJScreen provides modeled diesel PM concentrations from AirToxScreen. EJScreen reports diesel PM levels in air in micrograms per cubic meter (µg/m3).

Air toxics cancer risk

Table X.6 shows that estimated incremental lifetime cancer risks are approximately 20 in one million in the EJ census tracts that are within 1 mile of the facility, which is close to but below the statewide average cancer risk of 22 in one million. The state percentiles range from 25 to 31. These percentiles do not indicate elevated air toxics cancer risk from outdoor air in nearby EJ populations relative to other parts of the state.

Air toxics are pollutants that may cause cancer. Living near facilities that release air toxics at sufficiently high levels has been linked to increased cancer rates.

AirToxScreen estimates air toxics concentrations, human exposure, and potential cancer risk. AirToxScreen reports estimated incremental lifetime cancer risk from inhalation of combined air toxics as risk (probability) per lifetime per million people. This risk estimate only considers outdoor sources of air pollution, not indoor air.

Air toxics respiratory hazard index (HI)

Table X.6 shows that estimated respiratory HI ranges of 0.22 - 0.24 in all of the census tracts that are within 1 mile of the proposed project, which is very close to the statewide average of 0.25. The state percentiles range from 25 to 45. These percentiles do not indicate an elevated respiratory hazard in nearby EJ populations relative to other parts of the state.

Air toxics are pollutants that may cause irritation of eyes, skin and respiratory tract. People that are chronically exposed to air toxics at sufficiently high levels may have an increased chance of getting negative health effects including damage to the immune, neurological, reproductive, developmental, and respiratory systems.

AirToxScreen reports the potential noncancer effects of air toxics as a respiratory hazard index (HI), which is the ratio of an exposure concentration to a health-based reference concentration at the census tract level. The reference concentration is the level of the toxic in air at or below which adverse health effects are expected to be unlikely. Therefore, a HI less than or equal to 1 indicates that the exposure is not likely to result in adverse noncancer health effects.

Traffic proximity and volume

Table X.6 shows that 9 of the 17 census block groups are well below the statewide average. The other 8 block groups exceed the statewide average and have state percentiles ranging from 94 to 99 (with the highest 3 block groups 4 to 6 times the state average). The percentiles indicate a higher potential for exposure to traffic-related air pollution for those 8 block groups relative to other parts of the state.

Proximity to traffic can increase exposure to pollution which increases the risk of related health impacts. Proximity to roads is associated with cardiovascular disease, reduced lung function, impaired lung development, pre-term and low birth-weight infants, childhood leukemia, diabetes, stroke, and premature death.

The Traffic Proximity indicator in EJScreen is based on data from the US Department of Transportation National Transportation Atlas Database, Highway Performance Monitoring System. EJScreen reports traffic proximity as the count of vehicles per day (average annual daily traffic or AADT) at major roads within 500 meters (or nearest one beyond 500 m), divided by distance in meters (that is, the indicator is traffic counts weighted by distance from the block group).

Impervious Surfaces

Table X.6 shows that five out of the six census tracts have a higher percent of impervious surfaces compared to the state average of 35%, with a maximum of 47% impervious surface for 2 tracts.

The state percentile ranks range from 46 to 67. These values indicate a higher potential for heat island effects relative to other parts of the state.

Impervious surfaces and lack of tree canopy can contribute to heat island effects. Areas with more impervious surface tend to be warmer than average, while areas with more tree canopy cover tend to be cooler than average. Increased impervious surface and higher surface temperatures can increase heat-related deaths and illnesses, which can be exacerbated by air pollution.

4.7 Nearby Regulated Facilities

The applicant should use the MassDEP CIA Mapping Tool to identify and describe regulated facilities located within 1 mile of the proposed project. Applicable regulated facilities are those facilities listed in 310 CMR 7.02(14) *Table 1: Indicators*.

Follow the steps provided in Section 4.2 to create a map and download the data for the regulated facilities, and in Section 4.4 for measuring distances from each regulated facility to the proposed project. The mapping tool will generate a separate, labeled csv file for each type of regulated facility in the radius.

Where a category of regulated facility is not found within 1 mile the assessment table should list the category and indicate that none were found.

TRI and TURA facilities

If TRI or TURA facilities (listed as large quantity toxics users) are identified within a 1-mile radius of the proposed project, the applicant should determine whether the latest TRI or TURA report filed includes releases to the air and the amount of air releases.

For TRI facilities, the data is in the TRI_Reporting_Facilities_2022.CSV file downloaded from the MassDEP CIA Mapping Tool map for each TRI – see column AIR RELEASES. Note the reporting year for the data.

Alternatively, Form R may be found in EPA's Envirofacts (https://enviro.epa.gov/) database by searching by facility name or TRI facility ID (found in the CSV file downloaded from the MassDEP CIA Mapping Tool). The Form R will include the toxics released as well as the amounts.

If there are TURA facilities, they will be listed in the Large Quantity Toxic Users (LQTU).csv download. Where TURA facilities are identified, applicants should email MassDEP (massdep.impact@mass.gov) for information on releases that may not have been reported on the EPA Form R. Be sure to include the name, address, and FAC_ID for each TURA facility in your request.

Presentation of Information

The applicant should include a table similar to Table X.7 with regulated sites within a 1-mile radius of the proposed project. The remainder of this section provides an example of how this information should be presented in the Report using the 8 New Bond Street facility as an example.

Nearby Regulated Facilities

Hazardous substances from regulated facilities have the potential to move offsite and may negatively affect the health of nearby residents. For example, studies show an association

between proximity to municipal solid waste sites such as landfills, dumpsites, incinerators, open burning, recycling facilities, and anaerobic digestors and adverse health effects in nearby residents including adverse birth and neonatal outcomes and increased risk of mortality, respiratory disease, and negative mental health effects. Studies evaluating the health of populations near hazardous waste sites show an association between exposure and liver, breast, testis, and bladder cancers; non-Hodgkin lymphoma; asthma; low birth weight; and pre-term birth.

Regulated facilities within 1 mile of the proposed project are listed in Table X.7 and Figure X.3.

TABLE X.7. Regulated Facilities

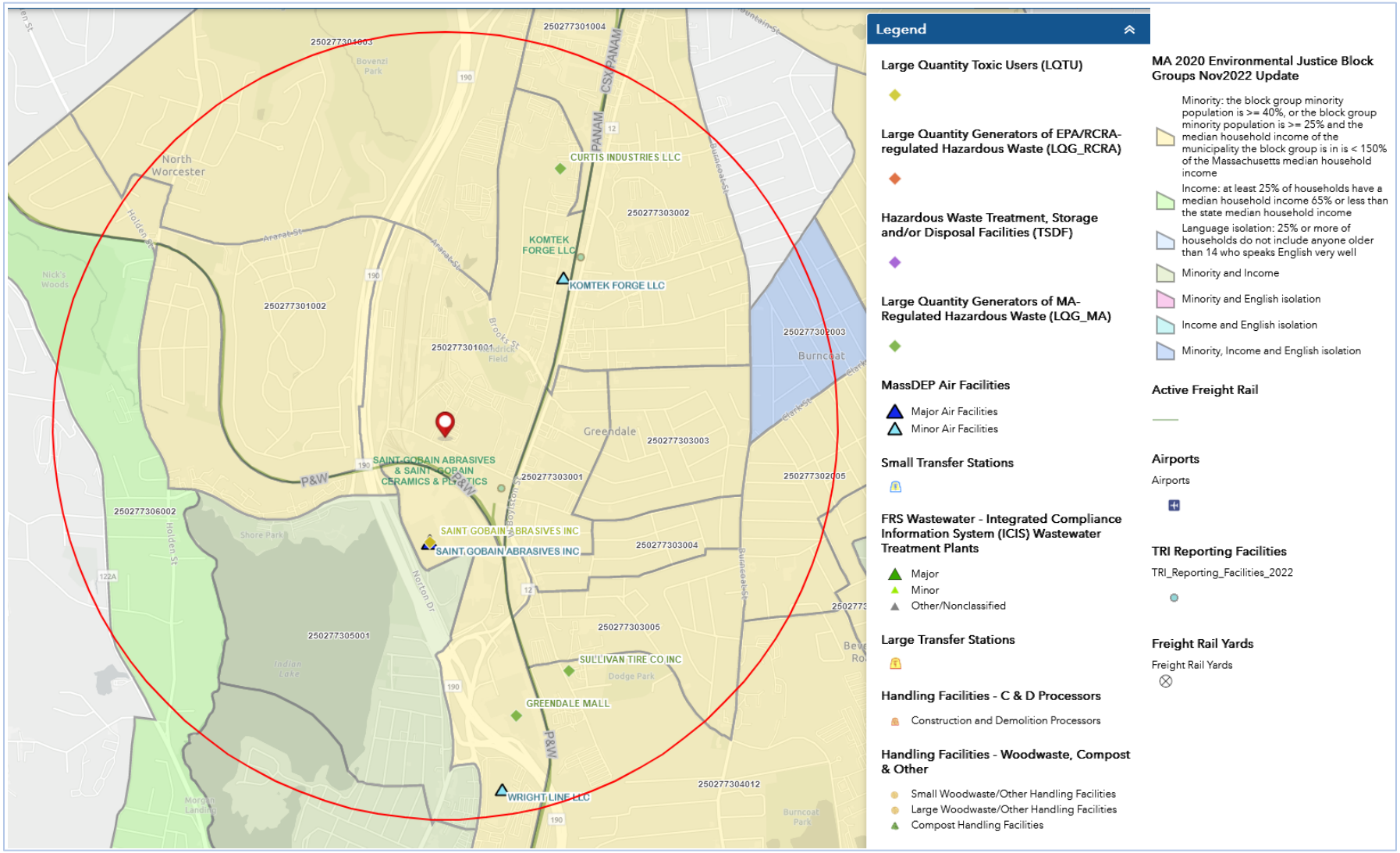
Category	Name	Address	In an EJ Block Group (GEOID)	Details
Facilities with DEP Air Permits	Saint-Gobain Abrasives Inc	1 New Bond Street	Yes	Major source air Operating Permit AQID: 1180115
	KOMTEK FORGE LLC	40 ROCKDALE ST	Yes	Minor source air permit AQID: 1180238
	WRIGHT LINE LLC	160 GOLD STAR BLVD	Yes	Minor source air permit AQID: 1180104
Facilities reporting under the EPA TRI program	Komtek Forge LLC (aka: KT Acquisition LLC)	40 Rockdale	Yes	Industry Sector: Fabricated Metals TRI Facility ID: 01606KMTKX40ROC Registry ID: 110000309274 Reporting Year: 2021 Air Releases (lb): 47
	Saint-Gobain Abrasives & Saint-Gobain Ceramics & Plastics	1 New Bond Street	Yes	Industry Sector: Nonmetallic Mineral Product TRI Facility ID: 01615NRTNC1NEWB Registry ID: 110000309354 Reporting Year: 2021 Air Releases (lb): 13,179
Facilities reporting under the Toxics Use Reduction Act (i.e., Large Quantity Toxic Users)	Komtek Technologies	40 Rockdale St	Yes	No longer reporting under TURA. Last reported in 2015.
	Saint Gobain Abrasives Inc	1 New Bond Street	Yes	2020 air releases = 25,072 lbs
	Komtek Technologies	40 Rockdale St	Yes	

Category	Name	Address	In an EJ Block Group (GEOID)	Details
Large quantity hazardous waste generators	Curtis Industries LLC	111 Higgins St	Yes	
	Saint Gobain Abrasives Inc	1 New Bond Street	Yes	
Wastewater treatment plants	none			
Hazardous waste treatment, storage and disposal facilities	none			
Solid waste diversion and disposal facilities[1]	none			
Airports	none			
Freight rail yards	none			
Port facilities	none			

Source: MassDEP CIA Mapping Tool (see *Show item details* for source of each layer).

[1] Includes transfer stations by type, active municipal solid waste combustors, active landfills, and recycling operations.

FIGURE X.3. Regulated facilities



Note: The facility is shown on the map with a red pin. Source: MassDEP CIA Mapping Tool.

Facilities with MassDEP Air Permits

Facilities with MassDEP air permits are sources of air emissions. Facilities that have the potential to emit higher amounts of air pollutants are classified as "major sources" of emissions and must obtain an Operating Permit, in addition to an air permit, that summarizes the requirements and emissions standards the facility must comply with. Examples of major sources include power plants, wastewater treatment plants, universities, municipal waste combustors, landfills, large manufacturers, airports, and fuel storage facilities. Facilities that do not require an Operating Permit are classified as "minor sources" of air emissions. Examples of minor sources include small manufacturers, crematories, schools/colleges, hospitals, asphalt/concrete plants, food processing facilities, and laboratories. The 8 New Bond Street facility does not require a MassDEP air permit. Table X.7 shows there is one facility with a MassDEP air operating permit within a 1-mile radius of the proposed project: Saint Gobain Abrasives. This facility is adjacent to the proposed project. Table X.7 also shows there are two facilities with air permits that are minor sources.

Facilities that report under TRI

Facilities that use certain amounts of toxic chemicals are required to report their toxic chemical use and releases to EPA under the Toxics Use Release (TRI) program. Table X.7 shows there are two TRI facilities within a 1-mile radius of the facility: Saint-Gobain Abrasives / Saint-Gobain Ceramics & Plastics and KOMTEK FORGE LLC (aka: KT Acquisition LLC).

Facilities that report under TURA

Facilities that use certain amounts of toxic chemicals are required to report their toxics chemical use and releases to MassDEP under the Toxics Use Reduction Act (TURA). Most of these facilities also file TRI reports to EPA. Table X.7 shows there are two large quantity toxic users within a 1-mile radius of the facility (which are the same as the two TRI facilities): Saint-Gobain Abrasives / Saint-Gobain Ceramics & Plastics and Komtek Technologies.

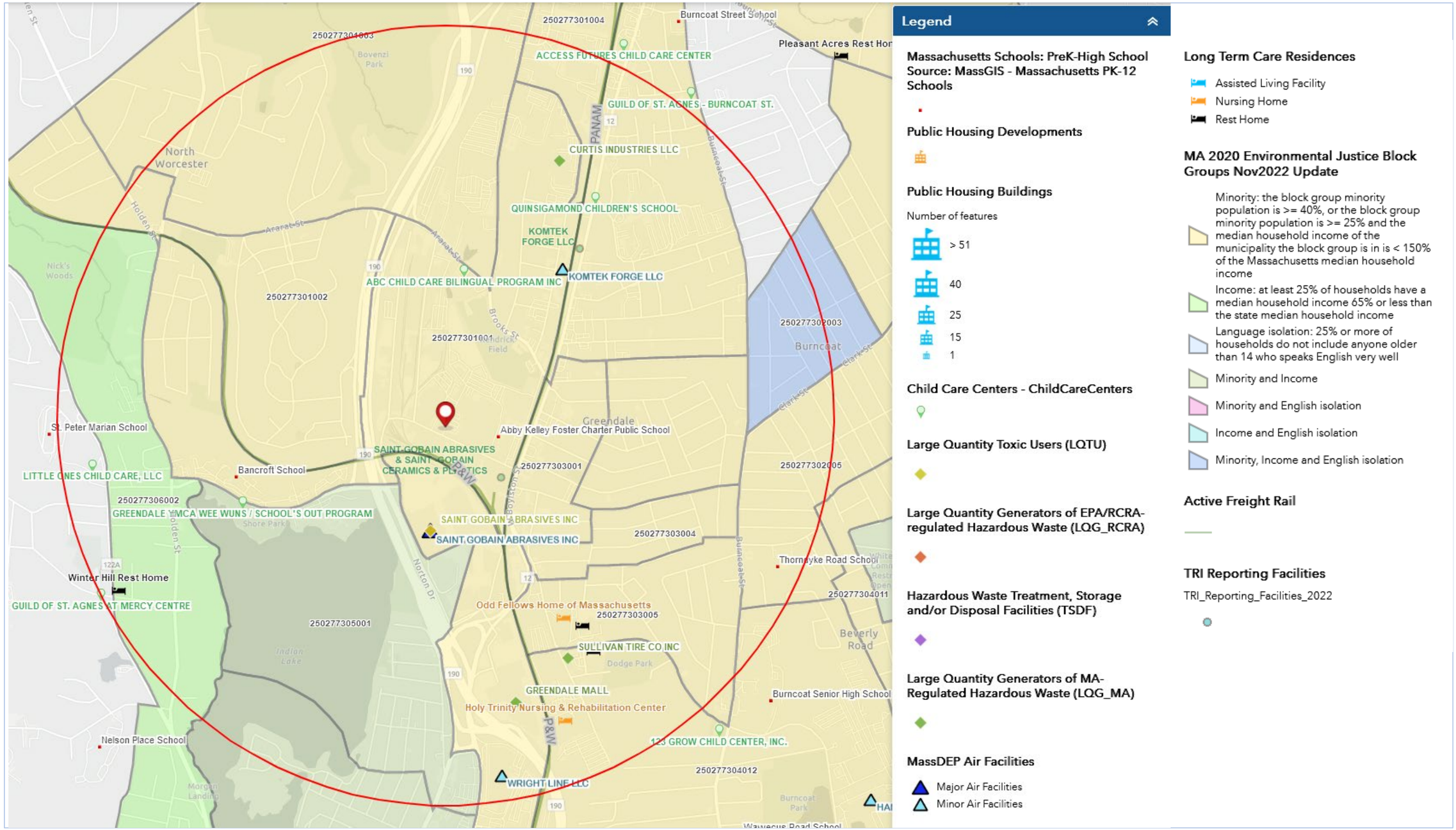
Large Quantity Hazardous Waste Generators

Facilities that generate large quantities of hazardous waste must register with MassDEP. Table X.7 shows there are three large quantity generators of hazardous waste within a 1-mile radius of the proposed project: Saint-Gobain Abrasives / Saint-Gobain Ceramics & Plastics and Komtek Forge LLC (aka: KT Acquisition LLC) and Curtis Industries LLC.

Combined Map

Figure X.4 is a large format map that shows both sensitive receptors and regulated facilities within a 1-mile radius of the facility along with EJ block groups.

Figure X.4 Regulated facilities, Sensitive Receptors and EJ Block Groups Combined Map



Source: MassDEP Cumulative Impact Analysis Mapping Tool.

4.8 Air Quality and Public Health Public Comments

310 CMR 7.02(14)(c)2. requires the applicant to document relevant comments received regarding air quality and public health made by municipal officials, organizations, representatives and residents in nearby environmental justice populations, and other parties raised during the public involvement opportunities. 310 CMR 7.02(14)(c)3. requires the applicant to include in the results of the cumulative impact analysis an overall narrative describing existing community conditions, including documentation of public comments. Note also that 310 CMR 7.02(14)(g)2.a. requires the applicant to include in the CIA Report a summary of public comments received and the applicant's written responses to the public comments. Therefore, during the public involvement and community conditions assessment processes the applicant should document public comments received and the responses provided to these comments in the CIA Report.

5 Air Quality Dispersion Modeling

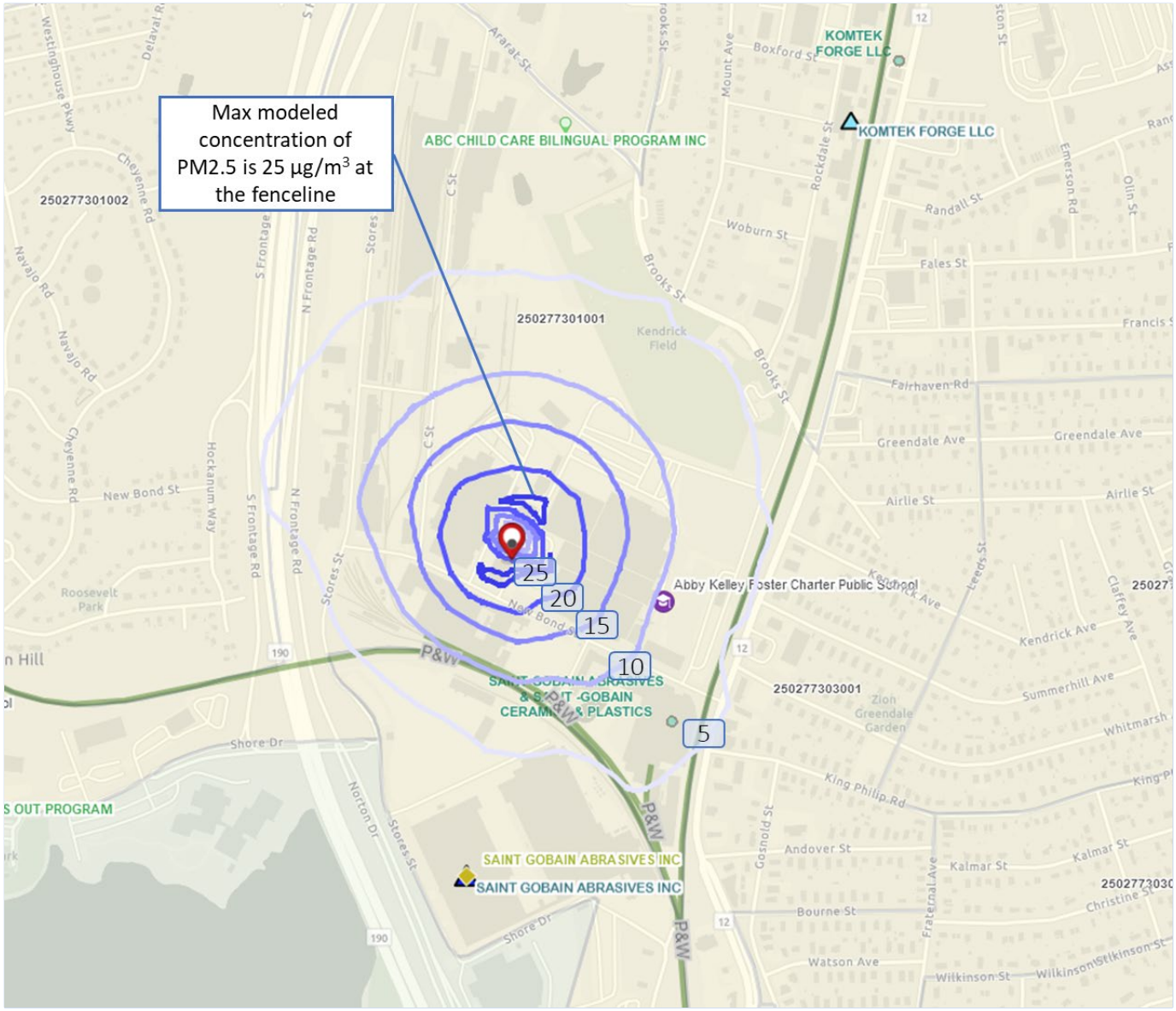
310 CMR 7.02(14)(d) requires the applicant to conduct air dispersion modeling of criteria pollutants. The air dispersion model is a tool that can be used to predict how a potential new or modified emission source will affect air quality. The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) air quality dispersion model is the standard model used to support federal and state regulatory air permitting. This model uses emission rates, source parameters, and meteorological inputs to predict concentrations of pollutants at downwind receptor locations. Generally, the modeling is used to perform a worst-case analysis, in that it uses the maximum potential emission rates for each pollutant from each emissions unit and combines that with the most recent 5 years of representative hourly meteorological data to calculate and locate the highest concentrations over a receptor grid surrounding a proposed new emissions source. The identification of nearby significant sources should be determined on a case-by-case basis in consultation with MassDEP based on available data and potential impacts to EJ populations.

If a proposed project includes significant new vehicle emissions, those vehicle emissions must be included in the modeling[3]. The criteria pollutant modeling must consist of facility-wide modeling that includes potential emissions from the proposed project (including significant vehicle emissions associated with the project), and existing facility-wide emissions (if the CPA is for an existing facility) and background pollutant concentrations (based on data from ambient air monitoring stations). If there are nearby significant sources of criteria pollutants, actual emissions from these sources should also be included in the modeling.[2] The total pollutant concentrations should then be compared to applicable Massachusetts Ambient Air Quality Standards and EPA's National Ambient Air Quality Standards (NAAQS).[5][3] Applicants should create concentration contour maps superimposed on EJ block groups and air emissions sources to include in the report (see example Figure X.5). The add data feature of the CIA mapping tool is useful for importing contours to display with EJ block groups, emissions sources, and sensitive receptors. The maps should show the property boundary and show the location of the maximum modeled concentration and the modeled concentration at the nearest EJ block group (if different than the location of the maximum concentration). The map should include nearby sensitive receptors.

[2] See MassDEP's Air Quality Modeling Guidance for additional information on air dispersion modeling available at https://www.mass.gov/guides/massdep-air-plan-approval-applications#-air-quality-modeling-.

[5] EPA has established NAAQS for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead; Massachusetts has ambient air quality standards that are identical to the NAAQS. NAAQS are national air emissions standards that EPA establishes to protect public health, including at-risk populations such as children, with an adequate margin of safety.

FIGURE X.5 Modeled Maximum 24-hour $PM_{2.5}$ Concentrations (µg/m³)



Note: The facility is shown on the map with a red pin. Source: MassDEP CIA Mapping Tool.

The applicant should submit a project-specific modeling protocol to MassDEP for review and approval. Protocols should be prepared in accordance with the guidelines contained in the Massachusetts Air Quality Modeling Guidance available at https://www.mass.gov/guides/massdep-air-plan-approval-applications.

6 Air Toxics Risk Characterization

Air toxics are pollutants that may be present in ambient air and are associated with increased risk of cancer or other serious health conditions after exposure to elevated concentrations over many years. Sometimes referred to as hazardous air pollutants (HAPs), air toxics are regulated separately from criteria air pollutants. Air toxics can have various effects (e.g., difficulty breathing, headaches) on the human body associated with high short-term exposure

(e.g., minutes to hours) and long-term exposure (multiple years) that may lead to cancer, birth defects, respiratory and nervous system disorders, and other serious health conditions.

310 CMR 7.02(14)(e) requires the applicant to conduct a cumulative air toxics risk characterization of air toxic emissions. An air toxics cumulative risk characterization evaluates the potential human health risks from exposures to air toxics by adding up the cancer and noncancer risks posed by each individual air toxic and comparing the cumulative risks to acceptable health-based risk standards or guidelines. Potential cancer risk is expressed as excess lifetime cancer risk, and non-cancer risk is expressed as a hazard index (HI).

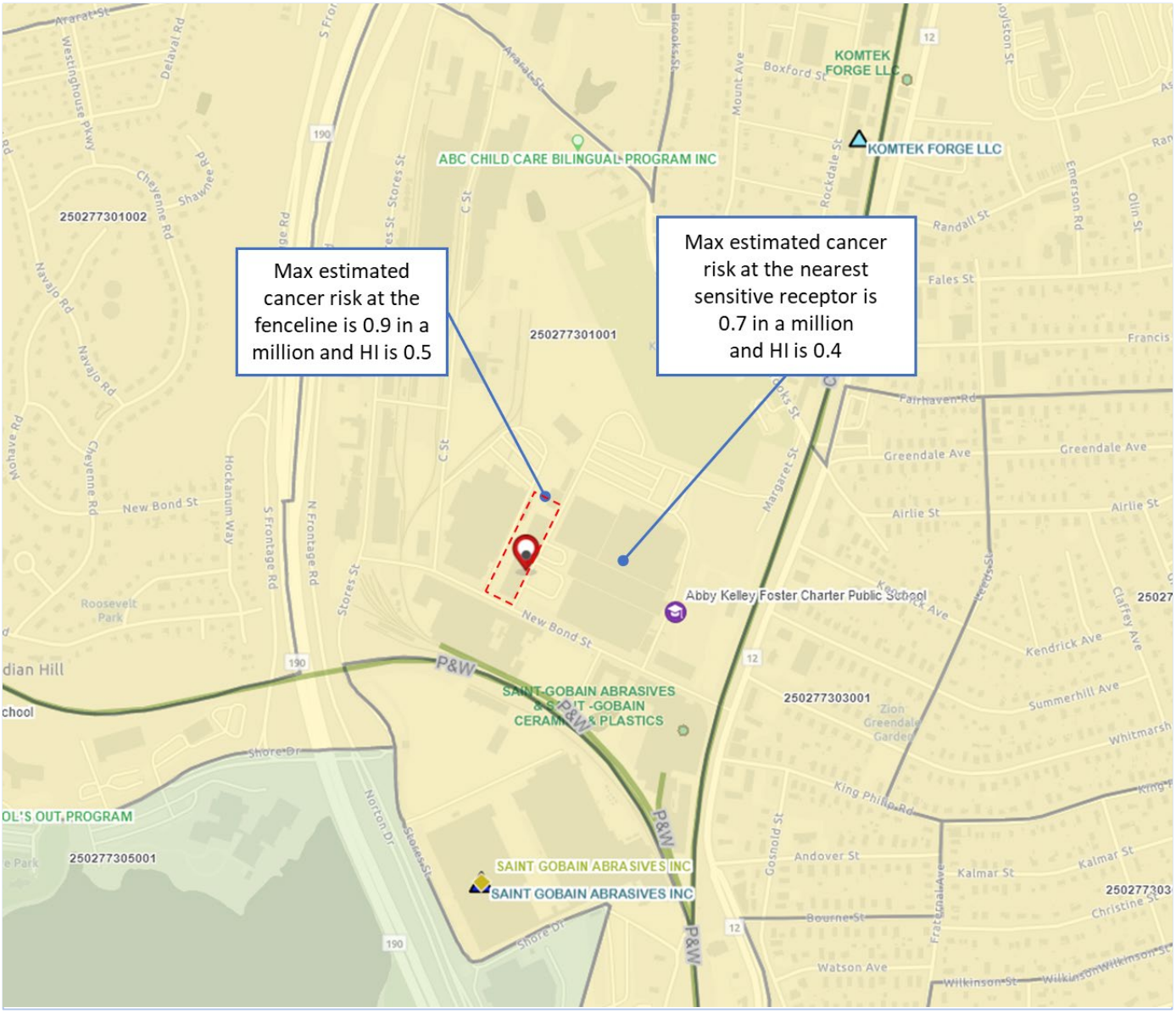
To facilitate the air toxics cumulative risk characterization process, MassDEP developed the Massachusetts Air Toxics Risk Screening Tool (MATRiST), which is a risk screening spreadsheet tool that contains default Massachusetts-specific air dispersion factors and toxicity information for 237 air toxics developed by MassDEP's Office of Research and Standards. To use the tool, the applicant (or their consultant) inputs source-specific project information (e.g., potential emissions, stack height, distance to receptors, rural vs urban setting). The screening spreadsheet tool calculates air concentrations using default air dispersion factors and generates cumulative cancer risk, and a chronic and acute noncancer hazard index value using the 95^{th} percentile for the 1-hour and the 24-hour concentrations. Since the tool uses worst-case default air dispersion factors, the applicant may choose to conduct air dispersion modeling and manually input source-specific dispersion factors into the spreadsheet tool. For source-specific analyses, the applicant should use the 1-hour and 24-hour maximum concentrations. Risk should be calculated iteratively using at least two receptors: property line and a receptor in the closest nearby Environmental Justice (EJ) population. If there are nearby significant air pollutant emissions sources the applicant should consult with MassDEP regional staff about including emissions from these sources in the risk characterization

The applicant may choose to conduct air dispersion modeling and a comprehensive air toxics emissions risk characterization without using the spreadsheet tool. The applicant must consult with the MassDEP Regional Office to identify all requirements for modeling and conducting air toxics risk characterization for the project and submit the resulting protocol for air toxics modeling and risk characterization to MassDEP for review and approval.

MassDEP's CIA regulations require proposed project cumulative cancer risks to not exceed an excess lifetime cancer risk equal to ten in one million, and cumulative non-cancer risks to not exceed a hazard index equal to one at any receptor location analyzed (i.e., property line and sensitive receptors in EJ populations). These risk standards are the same standards MassDEP uses in its Waste Site Cleanup Program to determine acceptable total site risks for a waste site cleanup.

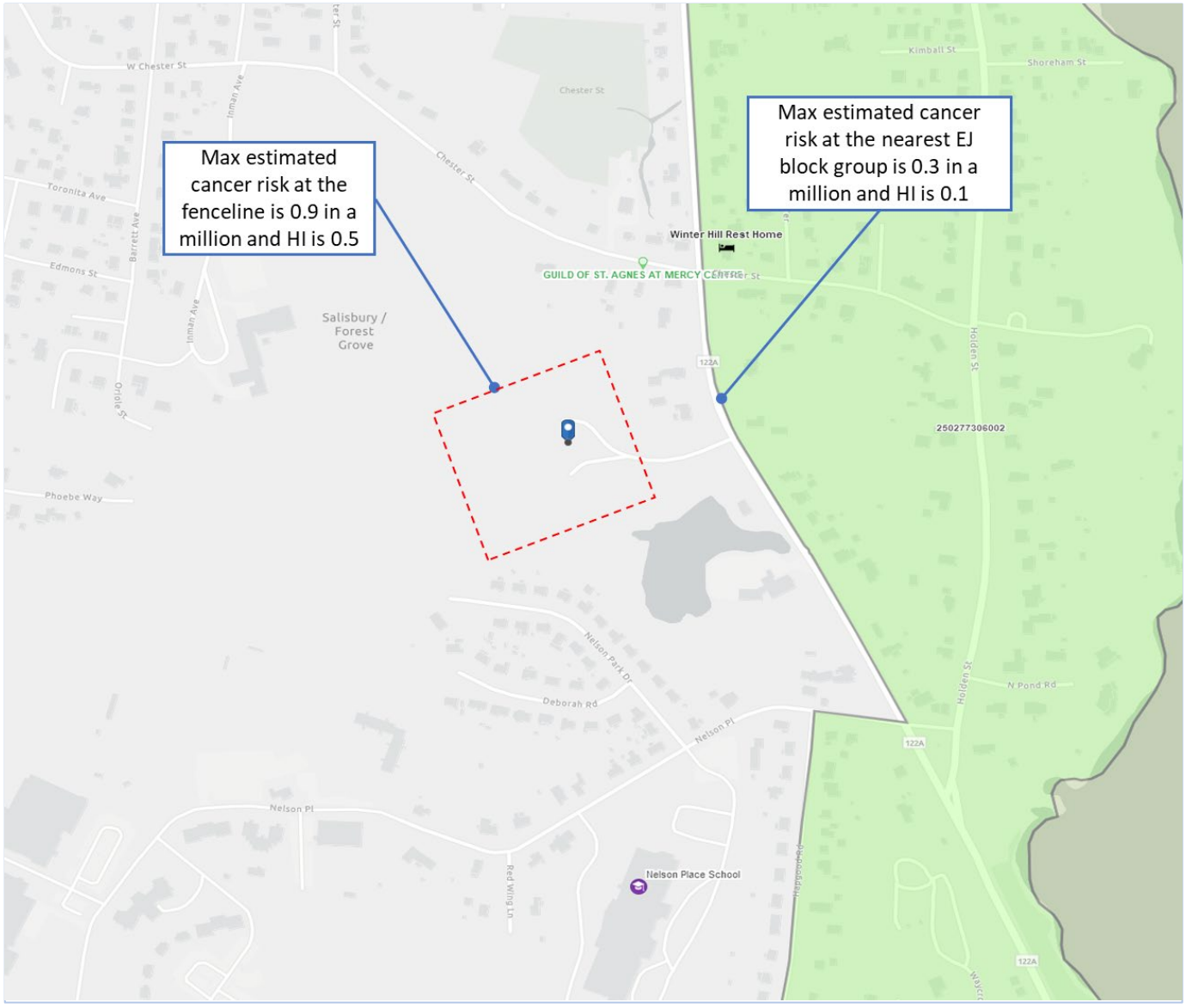
The applicant should summarize in its cumulative impact analysis report required under 310 CMR 7.02(14)(g) its evaluation of the project's cumulative impacts and any mitigation measures it will take. The report should include a map showing the location of the property boundary and the EJ block group that has the maximum estimated cancer risk and the magnitude of the cancer risk and hazard index at that location (see example Figure X.6 where the fence line is in an EJ block group, and Figure X.7 where the facility is near an EJ block group). If the highest estimated cancer risk is not at the same location as the maximum hazard index, the map should show both locations. The map should include nearby sensitive receptors.

FIGURE X.6 Maximum Cancer Risk and Hazard Index (HI) Location (example of a facility in an EJ block group)



Note: The facility is shown on the map with a red pin. Source: MassDEP CIA Mapping Tool.

FIGURE X.7. Maximum Cancer Risk and Hazard Index (HI) Locations (example of a facility outside an EJ block group)



Note: The facility is shown on the map with a blue pin. Source: MassDEP CIA Mapping Tool.

7 Evaluation of Proposed Project Cumulative Impacts

310 CMR 7.02(14)(f) requires the applicant to evaluate and describe how criteria air pollutant and air toxics emissions from the proposed project could affect existing environmental and public health conditions in nearby environmental justice populations, and to describe any mitigation measures that the applicant will implement to reduce or minimize the cumulative impacts of the proposed project. Mitigation measures may include measures to reduce exposure to air pollutants but are not limited to air quality and could include other measures. Mitigation measures for reducing exposure to air pollutants include electrifying vehicles, installing air filtration in buildings, and adding vegetative barriers to reduce sound impacts. Other types of mitigation measures or community benefits could include providing additional greenspaces, improving drainage, or providing resources for community wellness programs that may ameliorate existing environmental and health burdens in the community. While the CIA

regulations do not mandate mitigation measures, the CIA provides the information (via assessment of existing conditions and evaluation of impacts) and the process (meaningful public involvement of EJ populations, local officials, and other stakeholders) that can lead the applicant to agree to implement mitigation measures to reduce health and environmental hazards and impacts. The CIA could document any mitigation measures or agreements to address community impacts.

If the applicant filed an Environmental Impact Report (EIR) under the MEPA regulations [301 CMR 11.06(7)(b)] for any aspect of the proposed project, the applicant should summarize the EIR's conclusions regarding any existing unfair or inequitable environmental burden and related public health consequences and any potential disproportionate adverse impacts on nearby environmental justice populations, and measures that it will take to avoid, minimize, or mitigate such impacts.

In this step of the cumulative impact analysis the applicant should provide an overall evaluation of how potential air emissions could affect existing health conditions, air quality, and related health outcomes in EJ populations, using information from previous steps, including the existing community conditions assessment and modeling of criteria pollutants. The applicant should summarize and tie together the CIA components and highlight results and conclusions, and describe any mitigation measures, if any, that will be implemented to reduce or minimize the impacts of the project. Questions the applicant should address include:

- Are any health indicators generally higher than the state rate?
- Are multiple health indicators elevated in one or more census tracts?
- Are there particular health indicators that are consistently high in the EJ block groups?
- What do the health indicators say about the overall sensitivity of the community to air pollution?
- Are there mitigation measures the applicant can take to reduce emissions or impacts from the proposed project?

For example, if the assessment of existing community conditions shows EJ block groups with elevated pediatric asthma, the applicant should discuss how potential emissions could affect the elevated asthma (e.g., does the pollutant contribute to asthma, at what level, and to what degree?).

If the applicant evaluated potential noise or odor conditions posed by the project as part of the comprehensive plan application process, the applicant should summarize the evaluation results and mitigation measures to ensure no noise or odor conditions pose a nuisance to nearby EJ populations.

8 CIA Report

310 CMR 7.02(14)(g) requires the applicant to prepare a CIA report and submit it to MassDEP with the CPA. The CIA report should include the following sections:

1. Executive Summary of the CIA report including key questions and concerns raised by nearby EJ populations presented in a manner accessible to members of the community;
2. a description of the notice and public involvement measures conducted, including supporting documentation, and a summary of public comments received and the applicant's written responses;
3. the assessment of existing community conditions;

4. evaluation of project cumulative impacts; and
5. supporting technical reports, including the air quality dispersion modeling and risk characterization reports.

A primary objective of the CIA report is to clearly communicate the finding of the CIA to nearby EJ populations. The applicant should ensure that the body of the report (items 1-4 above) presents the most important information in a manner that is accessible to the members of those communities and care should be taken to ensure brevity and the use of non-technical language. Applicants are encouraged to go beyond this guidance in developing visualizations of data collected that will make the key components and findings easily and quickly understandable to the public. The body of the report should be able to stand alone so that members of nearby EJ populations can understand its contents without delving into technical document attachments. Ideally it should be in a format that easily can be distributed both in hardcopy and electronically.

Within three days of submittal to MassDEP, the applicant must notify the MassDEP EJ Director, nearby EJ populations, and local officials that the application for the CPA, including CIA report, is available for review and that the public may ask questions or submit informal comments to the applicant and MassDEP. This step is an opportunity for informal comment while MassDEP reviews the CIA report and CPA prior to the formal public comment period MassDEP holds on its proposed decision. In some cases, the applicant may choose to supplement the CIA report and CPA based on informal public comments and questions, or MassDEP may request that the applicant supplement the CIA or CPA.

9 MassDEP Review and Decision (including notice and involvement)

310 CMR 7.01(14)(h) describes the steps MassDEP will take to review the CPA and CIA report, including comments submitted by the public, and issue a proposed decision to approve or deny the CPA and then hold a 60-day formal public comment period on its proposed decision. After reviewing the comments received during the formal public comment period, MassDEP will issue a final decision approving or denying the CPA. MassDEP's final decision will be subject to appeal, as provided under 310 CMR 7.51(1). In accordance with 310 CMR 7.51(1), any person who may want to appeal MassDEP's decision must provide comments to MassDEP during the formal public comment period, comments are limited to the content of the CPA and the scope of their appeal will be limited to the issues raised in their comments.

Attachment 1: Instructions & Template: Project Fact Sheet for Cumulative Impact Analysis and Comprehensive Plan Application

Overview & Instructions

The Massachusetts Department of Environmental Protection's (MassDEP) Cumulative Impact Analysis regulations at 310 CMR 7.02(14) require an applicant for an air quality Comprehensive Plan Application (CPA) for a project that requires a cumulative impact analysis (CIA) to distribute a Fact Sheet on the proposed project to nearby environmental justice (EJ) populations, local officials, and MassDEP at least 60 days prior to filing the CPA. MassDEP has prepared this Fact Sheet Template for applicants to use when preparing the required Fact Sheet. The applicant should include all the elements in the Template and should provide translations of the Fact Sheet in non-English languages as needed. Examples of Fact Sheets prepared for other air permit projects (whether requiring a CIA or not) are available at https://www.mass.gov/lists/project-fact-sheet-repository-massdep-air-permit-applications.

MassDEP CIA Fact Sheet Template

FACT SHEET

Company, City/Town

Air Quality Comprehensive Plan Application and

Cumulative Impact Analysis

Introduction

Please include the following or similar introductory language: [Company] plans to file an Air Quality Comprehensive Plan Application (CPA) with the Massachusetts Department of Environmental Protection (MassDEP) for its *proposed/existing* facility at *Street Address, City/Town*, Massachusetts. The proposed project is subject to the Massachusetts Air Pollution Control Regulations (310 CMR 7.00) and [Company] must receive MassDEP approval before it can begin construction of the project. In addition, [Company] is required by 310 CMR 7.02(14) to conduct a Cumulative Impact Analysis (CIA) prior to filing the CPA with MassDEP. The CIA includes enhanced public outreach to and involvement of nearby environmental justice populations, assessment of existing community conditions, and analysis of cumulative impacts of the proposed project. [Company] encourages members of the public who are interested in learning more about the proposed project, providing input to the CIA that is being conducted, or who wish to be added to a distribution list that will be used to keep community members informed, to contact [Name, email / phone] at [Company].

After conducting the cumulative impact analysis, [Company] will include it in its CPA that will be submitted to MassDEP. At that time [Company] will notify members of the public how they can review the CPA and CIA and how they can ask questions or submit informal comments to [Company] and MassDEP as MassDEP reviews the CPA and CIA. After completing its review, MassDEP will issue a proposed decision to approve or deny the CPA, and at that time will provide a formal 60-day public comment period on its proposed decision.

Facility Information

Provide the name of the project, and facility address, and name of the owner (and operator, if different). Provide a map of the facility with a 1-mile radius for a CPA for a non-major source and 5-mile radius for a CPA for a major source. Identify all EJ block groups that intersect the radius. Describe prior ownership history if that would provide relevant information to aid in understanding the project. Describe the purpose of the facility and its operations (e.g., manufactures X product, produces electricity for the grid, etc.). Provide a general description of the types of air permits the facility already has.

Project Information

Provide a description of the proposed project as it relates to the need for an air permit (e.g., adding a new metal coating line, replacing or upgrading an existing boiler), and identify the specific air permit required (e.g., Comprehensive Plan Approval for a non-major source or a major source).

Describe each emission unit (e.g., boiler, engine, coating line), pollutants that will be emitted to the air (e.g., nitrogen oxides, particulate matter, volatile organic compounds, hazardous air pollutants), pollution controls (e.g., low NOx burner, SCR, baghouse, oxidation catalyst, Best Management Practices), and proposed monitoring, testing, record keeping, and reporting. Wherever possible, summarize emissions data in tables or similar presentations.

Describe applicable federal air requirements (e.g., NSPS, NESHAP) as well as any other applicable state permitting requirements related to the CPA (e.g., Energy Facility Siting Board, MEPA). If the proposed project is being undertaken as a result of a MassDEP compliance action, describe the relevant compliance history including inspections, notices, administrative consent orders, etc.

Environmental Justice Populations

Identify and describe any designated EJ populations within one mile (or five miles for a major source) of the proposed project. Designated EJ Populations can be found via the downloadable files, maps, and spreadsheets available from MassDEP's CIA Mapping Tool.

Identify the location of the project relative to EJ Populations as depicted on the mapping tool and include a printout of the project location shown on the map. Describe any outreach the applicant already has conducted to any local officials in the municipality where the project is located, as well as any other potentially affected municipality (e.g., neighboring communities), and provide contact information for each. Also describe any outreach the applicant has conducted to contacts or groups in the designated EJ populations, and/or media outlets, and include the contact information. Also provide any recommended locations for local information repositories where paper copies of application materials can be housed for public viewing and provide contact information for these potential repository locations.

Applicant Contact Information

Provide the name, email address and phone number for one or more individuals representing the Project who will respond to any questions from interested stakeholders.