

5.0 Air Quality

This section includes descriptions of the regional climate and topography, common criteria air pollutants, and toxic air contaminants; identifies applicable regulations, plans and policies, for managing air quality; and contains evaluations of potential criteria air pollutant and toxic air contaminant impacts from constructing and operating future development within the project site.

The information within this section is largely sourced from:

- *McKinleyville Town Center Q-Zone* (Humboldt County 2024);
- *Humboldt County General Plan for the Areas Outside the Coastal Zone* (Humboldt County 2017); and
- *Particulate Matter (PM₁₀) Attainment Plan* (North Coast Air Quality Management District 1995).

Responses to the Notice of Preparation

There were no comments on the NOP regarding the scope of analysis related to air quality.

5.1 Environmental Setting

The environmental setting section incorporates information that is pertinent to assessing potential project impacts, and information specific to the proposed project and/or the project site. The information addresses topics that include regional climate and topography, human health effects of criteria air pollutants and toxic air contaminants (TACs), construction emissions, and presence of sensitive receptors.

Regional Climate and Topography

The project site is located within the North Coast Air Basin (air basin), which encompasses Humboldt, Del Norte, Trinity, and Mendocino counties, and a portion of Sonoma County.

Air quality is affected by both the rate and location where pollutants are emitted, and by meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

Air quality within the air basin is predominantly influenced by the climatic regimes of the Pacific. In summer, warm ground surfaces draw cool air in from the coast, creating frequent thick fogs along the coast and making northwesterly winds common. In winter, precipitation is high, surface wind directions are highly variable, and weather is more affected by oceanic storm patterns. Average temperatures in the area range from 46 degrees Fahrenheit in winter to 60 degrees Fahrenheit in summer, with an average total annual precipitation of 40.33 inches (U.S. Climate Data, 2024).

As a result of the region's topography and coastal air movements, inversion conditions are common in the air basin. Inversions are created when warm air traps cool air near the ground surface and prevents vertical dispersion of air. Valleys, geographic basins, and coastal areas surrounded by higher elevations are the most common locations for inversions to occur. During the summer, inversions are less prominent, and vertical dispersion of the air is generally good. However, during the cooler months between late fall and early spring, inversions last longer and are more geographically extensive; vertical air dispersion is poor, and pollution may be trapped near the ground for several consecutive days (Humboldt County 2017).

Criteria Air Pollutants and Their Effects on Human Health

The six most common and widespread air pollutants of concern, or "criteria pollutants," are ground level ozone, nitrogen oxides, particulate matter, carbon monoxide, sulfur dioxide, and lead. Reactive organic gases are also a key contributor to criteria pollutants, as they react with other substances to form ground level ozone. The common properties, sources, and related health and environmental effects of these pollutants are summarized in [Table 5-1, Common Criteria Air Pollutants](#).

Health effects of criteria air pollutants include, but are not limited to asthma, bronchitis, chest pain, coughing, throat irritation, and airway inflammation. Currently available modeling tools are not equipped to provide a meaningful analysis of the correlation between an individual development project's criteria air pollutant emissions and specific human health impacts. The thresholds of significance for criteria air pollutants crafted by local air districts are not intended to be indicative of any localized human health impact that an individual project may have. The CEQA air quality analysis for criteria air pollutants is not a localized, project-level impact analysis but one of regional, cumulative impacts. For these reasons, it is not the norm to conduct an analysis of the localized health impacts associated with criteria air pollutant emissions as part of the CEQA process.

Table 5-1 Common Criteria Air Pollutants

Pollutant	Properties	Major Sources	Related Health & Environmental Effects
Ozone (O ₃)	Ground level ozone is not emitted directly into the air. It results from chemical reactions between nitrogen oxides (NO _x) and reactive organic gases (ROG) in presence of sunlight.	<ul style="list-style-type: none"> ▪ Automobiles; ▪ Industrial facilities; ▪ Gasoline vapors; ▪ Chemical solvents; ▪ Electric utilities. 	<ul style="list-style-type: none"> ▪ Chest pain, coughing, throat irritation, and airway inflammation ▪ Worsens bronchitis, emphysema, and asthma. ▪ Affects sensitive vegetation and ecosystems
Nitrogen oxides (NO _x)	Group of highly reactive gases including nitrogen dioxide (NO ₂).	<ul style="list-style-type: none"> ▪ Combustion of fuel; ▪ Automobiles; ▪ Power plant; ▪ Off-road Equipment. 	<ul style="list-style-type: none"> ▪ Irritate respiratory system / increase respiratory infections ▪ Development of asthma ▪ Forms acid rain – harms sensitive ecosystems ▪ Creates hazy air ▪ Contributes to nutrient pollution in coastal waters
Respirable and Fine Particulate Matter (PM ₁₀) (PM _{2.5})	Mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, soot, dirt, or smoke can be seen with the naked eye. Others are so small that they can only be detected with an electron microscope.	<ul style="list-style-type: none"> ▪ Automobiles; ▪ Power Plants; ▪ Construction sites; ▪ Tilled farm fields; ▪ Unpaved roads; ▪ Smokestacks. 	<ul style="list-style-type: none"> ▪ Aggravated asthma; ▪ Irritation of the airways, coughing, and difficulty breathing; ▪ Decreased lung function; ▪ Premature death; ▪ Reduced visibility.
Carbon Monoxide (CO)	Colorless, odorless gas released when something is burned.	<ul style="list-style-type: none"> ▪ Fuel combustion; ▪ Industrial processes; ▪ Highly congested traffic. 	<ul style="list-style-type: none"> ▪ Chest pain for those with heart disease; ▪ Vision problems; ▪ Dizziness, unconsciousness, and death (at high levels).
Sulfur Oxides (SO _x)	In the entire group of sulfur oxides (SO _x), sulfur dioxide (SO ₂) is the component of the greatest concern.	<ul style="list-style-type: none"> ▪ Fuel combustion; ▪ Industrial processes; ▪ Locomotives, ships, and other heavy equipment; ▪ Volcanoes. 	<ul style="list-style-type: none"> ▪ Makes breathing difficult; ▪ Worsens asthma; ▪ Contributes to acid rain; ▪ Reduced visibility; ▪ Damages statues and monuments.
Lead (Pb)	Lead is a naturally occurring element found in small amounts in the earth’s crust.	<ul style="list-style-type: none"> ▪ Ore and metal processing; ▪ Leaded aviation fuel; ▪ Waste Incinerators; ▪ Utilities; ▪ Lead-acid battery manufacturers. 	<ul style="list-style-type: none"> ▪ High blood pressure and heart disease in adults; ▪ Behavioral problems, learning deficits, and lowered IQ in infants and young children; ▪ Decreased plant and animal growth; ▪ Neurological effects in vertebrates.

SOURCE: United States Environmental Protection Agency 2021

Ozone (O₃)

Ground-level ozone is created by chemical reactions between nitrogen oxides and reactive organic gases in the presence of sunlight. Since ground-level ozone is not emitted directly into the atmosphere, but formed because of photochemical reactions, it is considered a secondary pollutant.

Ozone is a strong irritant that attacks the respiratory system, leading to the damage of lung tissue. Asthma, bronchitis, and other respiratory ailments, as well as cardiovascular diseases, are aggravated by exposure to ozone. A healthy person exposed to high concentrations may become nauseated or dizzy, may develop a headache or cough, or may experience a burning sensation in the chest. Research has shown that exposure to ozone damages the alveoli (the individual air sacs in the lung where the exchange of oxygen and carbon dioxide between the air and blood takes place). Research has shown that ozone also damages vegetation.

If concentrations of reactive organic gases and/or nitrogen oxides exceed the applicable thresholds of significance, concentrations of ground level ozone resulting from these pollutants could potentially result in adverse human health impacts.

Reactive Organic Gases (ROG)

Reactive organic gases are emitted from a variety of sources, including liquid and solid fuel combustion, evaporation of organic solvents, and waste disposal.

Nitrogen Oxides (NO_x)

Most nitrogen oxides are created during combustion of fuels. Nitrogen oxides are a major contributor to ozone formation. Nitrogen dioxide is a reddish-brown gas that can irritate the lungs and can cause breathing difficulties at high concentrations. Like ozone, nitrogen dioxide is not directly emitted, but is formed through a reaction between nitric oxides and atmospheric oxygen. Nitrogen dioxide also contributes to the formation of particulate matter (see discussion below). Nitrogen dioxide concentrations in the air basin have been well below ambient air quality standards; therefore, nitrogen dioxide concentrations from land use projects are not a concern.

Particulate Matter (PM₁₀ and PM_{2.5})

Particulate matter refers to a wide range of solid or liquid particles in the atmosphere, including smoke, dust, aerosols, and metallic oxides. Particulate matter with diameter of 10 micrometers or less is referred to as PM₁₀. PM_{2.5} includes a subgroup of finer particles that have a diameter of 2.5 micrometers or less. Particulate matter is directly emitted to the atmosphere as a byproduct of fuel combustion, wind erosion of soil and unpaved roads, and from construction or agricultural operations. Small particles are also created in the atmosphere through chemical reactions. Approximately 64 percent of fugitive dust is respirable particulate matter. Minimal grading typically generates about 10 pounds per day per acre on average while excavation and earthmoving activities typically generate about 38 pounds per day per acre.

Although particles greater than 10 micrometers in diameter can cause irritation in the nose, throat, and bronchial tubes, natural mechanisms remove much of these particles. Particles less than 10 micrometers in diameter can pass through the body's natural defenses and the mucous membranes of the upper respiratory tract and enter into the lungs. The particles can damage the alveoli. The particles may also carry carcinogens and other toxic compounds, which can adhere to the particle surfaces and enter the lungs.

Carbon Monoxide (CO)

Carbon monoxide is a component of motor vehicle exhaust, which contributes about 56-percent of all carbon monoxide emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22-percent of all carbon monoxide emissions nationwide. Carbon monoxide can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. Carbon monoxide contributes to the formation of ground-level ozone.

Higher levels of carbon monoxide generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all carbon monoxide emissions may come from motor vehicle exhaust. Concentration of carbon monoxide is a direct function of vehicle idling time and traffic flow conditions. Transport of carbon monoxide emissions is extremely limited; it disperses rapidly from the source under normal meteorological conditions. However, under limited conditions, carbon monoxide concentrations along congested roadways or intersections may reach unhealthy levels, affecting local sensitive receptors (residents, school children, hospital patients, the elderly, etc.). Emissions thresholds established for carbon monoxide apply to direct or stationary sources.

Typically, high carbon monoxide concentrations are associated with roadways or intersections operating at unacceptable levels of service. Congested intersections can result in carbon monoxide "hot spots," where localized high concentrations of carbon monoxide occur.

Sulfur Oxides (SO_x)

Sulfur dioxide (SO₂) is the component of greatest concern and is used as the indicator for the larger group of gaseous sulfur oxides (SO_x). Emissions that lead to high concentrations of SO₂ generally also lead to the formation of other sulfur oxides. Sulfur dioxide is a colorless acid gas with a pungent odor. Sulfur dioxide is produced by the combustion of sulfur-containing fuels, such as oil, coal and diesel. Sulfur dioxide dissolves in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment. Health effects of sulfur dioxide include damage to lung tissue and increased risk of acute and chronic respiratory disease.

Lead (Pb)

Lead is a metal found naturally in the environment as well as in manufactured products. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. Emissions of lead from the transportation sector and levels of lead in the air decreased 98 percent between 1980 and 2014 (United States Environmental Protection Agency 2017), following regulatory efforts to ultimately remove lead from gasoline. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Toxic Air Contaminants and their Effects on Human Health

Toxic air contaminants are pollutants that may pose a present or potential hazard to human health. Health effects include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. Toxic air contaminants can be classified as either carcinogens or non-carcinogens.

Diesel Emissions

Diesel exhaust is the predominant toxic air contaminant in urban air and is estimated to represent about two-thirds of the cancer risk from toxic air contaminants. Diesel engines emit a complex mix of pollutants including nitrogen oxides, particulate matter, and toxic air contaminants. The most visible constituents of diesel exhaust are very small carbon particles or soot, known as diesel particulate matter (DPM). Diesel exhaust also contains over 40 cancer-causing substances, most of which are readily adsorbed on the soot particles. Among the toxic air contaminants contained in diesel exhaust are dioxin, lead, polycyclic organic matter, and acrolein. Diesel engine emissions are responsible for about 70 percent of California's estimated cancer risk attributable to toxic air contaminants (California Air Resources Board 2023). As a significant fraction of particulate pollution, DPM contributes to numerous health impacts, including increased hospital admissions, particularly for heart disease, but also for respiratory illness, and even premature death.

Diesel exhaust is especially common during the grading stage of construction (when most of the heavy equipment is used), and adjacent to heavily trafficked roadways where diesel trucks are common. The United States Environmental Protection Agency (EPA) regulates diesel engine design and fuel composition at the federal level, and has implemented a series of measures since 1993 to reduce nitrogen oxides and particulate emissions from off-road and highway diesel equipment. Before EPA began regulating sulfur in diesel, diesel fuel contained as much as 5,000 parts per million (ppm) of sulfur. In 2006, EPA introduced regulations to lower the amount of sulfur in diesel fuels to 15 ppm (United States Environmental Protection Agency 2021). This fuel is known as ultra-low sulfur diesel.

EPA Tier 1 non-road diesel engine standards were introduced in 1996, Tier 2 in 2001, Tier 3 in 2006, with final Tier 4 in 2014 (DieselNet 2022). [Table 5-2, Typical Non- Road Engine Emissions Standards](#), compares emissions standards for NO_x and particulate matter from non-road engine Tier 1 through Tier 4 for typical engine sizes. As illustrated in the table, emissions for these pollutants have decreased significantly for construction equipment manufactured over the past 20 years, and especially for construction equipment manufactured in the past seven years.

Table 5-2 Typical Non- Road Engine Emissions Standards

Engine Tier and Year Introduced	NO _x Emissions ¹			Particulate Emissions ¹		
	100-175 HP	175-300 HP	300-600 HP	100-175 HP	175-300 HP	300-600 HP
Tier 1 (1996)	6.90	6.90	6.90	--	0.40	0.40
Tier 2 (2001)	--	--	--	0.22	0.15	0.15
Tier 3 (2006)	--	--	--	-- † ²	-- † ²	-- † ²
Tier 4 (2014) ³	0.30	0.30	0.30	0.015	0.015	0.015

SOURCE: DieselNet 2022

NOTES:

1. Expressed in g/bhp-hr, where g/bhp-hr stands for grams per brake horsepower-hour.
2. † - Not adopted, engines must meet Tier 2 PM standard.
3. Tier 4 diesel engines would reduce DPM as much as 85 percent (Diesel Net, 2022).

In California, non-road equipment fleets can retain older equipment, but fleets must meet averaged emissions limits. Since 2018, new equipment for large and medium fleets must be Tier 3 or better. Recent amendments approved by the California Air Resources Board in 2022 require that added vehicles be cleaner than previously required and that older, dirtier engines be removed from operation. The 2022 amendments expand the restrictions on vehicles added to each fleet. A small fleet has total horsepower of 2,500 or less, and a medium fleet has total horsepower of between 2,500 and 5,000, and large fleets with horsepower greater than 5,000. All fleets were prohibited from adding Tier 0 vehicles beginning January 1, 2014. Small and ultra-small fleets have a more gradual rollout of added engine restrictions. The adding of vehicles with Tier 3 engines are prohibited for small and ultra-small fleets starting in 2024. Further, Tier 4 Interim and 2006 or older on-road vehicles are prohibited in 2028 for small fleets and in 2035 for ultra-small fleets. The 2022 amendments further prohibit the engines that can be added to large and medium fleets. Starting January 1, 2024, Tier 3, Tier 4 Interim, and 2006 or older on-road vehicles are prohibited from being added to large and medium fleets. In effect, only Tier 4 Final or cleaner engines may be added to large and medium fleets starting January 1, 2024 (California Air Resources Board 2023b).

Construction Emissions

Emissions generated during construction are “short-term” in the sense that they would be limited to the actual periods of site development and construction. Short-term construction emissions are typically generated by the use of heavy equipment, the transport of materials, and construction employee commute trips. Construction-related emissions consist primarily of reactive organic gases, nitrogen oxides, DPM, respirable and fine particulate matter, and carbon monoxide. Emissions of reactive organic gasses, nitrogen oxides, DPM, and carbon monoxide are generated primarily by the operation of gas and diesel-powered motor vehicles, asphalt paving activities, and the application of architectural coatings. Respirable and fine particulate matter emissions are generated primarily by wind erosion of exposed graded surfaces.

Polycyclic Aromatic Hydrocarbons (PAHs)

The U.S. Center for Disease Control describes polycyclic aromatic hydrocarbons (PAHs) as a class of chemicals that occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, gas, wood, garbage, and tobacco are burned. PAHs generated from these sources can bind to or form small particles in the air. High-temperature cooking will form PAHs in meat and in other foods. Some PAHs are carcinogenic and prolonged exposure can lead to increased health risks. The health effects from environmental exposure to low levels of PAHs are unknown. Large amounts of naphthalene in air can irritate eyes and breathing passages. Workers who have been exposed to large amounts of naphthalene from skin contact with the liquid form and from breathing naphthalene vapor have developed blood and liver abnormalities. (United States Environmental Protection Agency 2022).

Sensitive Receptors

Although air pollution can affect all segments of the population, certain groups are more susceptible to its adverse effects than others. Children, the elderly, and the chronically or acutely ill are the most sensitive population groups. These sensitive receptors are commonly associated with specific land uses such as residential areas, schools, retirement homes, and hospitals.

Existing sensitive receptors located adjacent to or in the vicinity of the project site include a residential subdivision north of the segment of Railroad Drive between McKinleyville Avenue and Central Avenue, residential uses north of the eastern segment Railroad Drive, a senior living development and residential subdivision adjacent to the south boundary of the site, and residential uses east of McKinleyville Avenue. McKinleyville Middle School is located at the southeast corner of the Railroad Drive/Central Avenue intersection. Refer to [Figure 3-2, Existing Conditions](#), for the location of sensitive residential receptors. New on-site sensitive receptors (residents) would be introduced as the site is developed with residential uses and senior living facilities.

5.2 Regulatory Setting

Federal

United States Environmental Protection Agency

The EPA was established on December 2, 1970, to create a single agency that covered several agency concerns: federal research, monitoring, standard-setting and enforcement. The purpose of the EPA is to protect the overall health of humans and the environment. The EPA does this by safeguarding all Americans from the hazardous risks in the environment where they live and work. Environmental safety is one of the primary concerns of U.S. policies and the following are commonly used to establish environmental policy: natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade. The EPA has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft. Construction equipment used for the project, including heavy-duty trucks, and off-road construction equipment would be required to comply with the U.S. EPA Nonroad Diesel Rule emission standards.

Federal Clean Air Act

Air quality is regulated on the federal level. The Clean Air Act, adopted in 1970 and amended in 1990, set federal standards for air quality.

The federal Clean Air Act required the EPA to set National Ambient Air Quality Standards for several air pollutants on the basis of human health and welfare criteria. The Clean Air Act also set deadlines for the attainment of these standards. The Clean Air Act established two types of national air standards: primary and secondary standards. Primary standards set limits to protect public health, including the health of sensitive persons such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Historically, air quality laws and regulations have divided air pollutants into two broad categories of airborne pollutants: “criteria pollutants” and “toxic air contaminants.”

In general, the Clean Air Act creates a partnership between state and federal governments for implementation of the Clean Air Act provisions. The federal Clean Air Act requires states to prepare an air quality control plan known as a State Implementation Plan. California’s State Implementation Plan contains the strategies and control measures that California will use to attain the National Ambient Air Quality Standards. If, when reviewing the State Implementation Plan for conformity with Clean Air Act Amendments mandates, the EPA determines a State Implementation Plan to be inadequate, EPA may prepare a Federal Implementation Plan for the non-attainment area and may impose additional control measures.

National Ambient Air Quality Standards

Ambient air quality is described in terms of compliance with the state and national standards. State standards are discussed below. In general, criteria pollutants are pervasive constituents, such as those emitted in vast quantities by the combustion of fossil fuels. Both the state and federal governments have developed ambient air quality standards for the most prevalent pollutants, which include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter, and fine particulate matter. [Table 5-3, National and California Ambient Air Quality Standards](#), lists state and federal ambient air quality standards for common air pollutants.

Table 5-3 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	National Standards ¹				California Standards ²	
		Primary ^{3,4}		Secondary ^{3,5}		Concentration ³	
		ppm	µg/m ³	ppm	µg/m ³	ppm	µg/m ³
Ozone ⁶	1 Hour	-	-	-	-	0.09	180
	8 Hour	0.07	137	0.07	137	0.07	137
PM ₁₀ ⁷	24 Hour	-	150	-	150	-	50
	Annual	-	-	-	-	-	20
PM _{2.5} ⁷	24 Hour	-	35	-	35	-	-
	Annual	-	12	-	15	-	12
Carbon Monoxide (CO)	8 Hour	9	10	-	-	9.0	10
	1 Hour	35	40	-	-	20.0	23
Nitrogen Dioxide (NO ₂) ⁸	Annual	0.053	100	0.053	100	0.03	57
	1 Hour	0.10	188	-	-	0.18	339
Sulfur Dioxide (SO ₂) ⁹	Annual	0.03	See note 9	-	-	-	-
	24 Hour	0.14	See note 9	-	-	0.04	105
	3 Hour	-	-	0.5	1,300	-	-
	1 Hour	0.075	196	-	-	0.25	655
Lead ^{10,11}	30 Day Average	-	-	-	-	-	1.5
	Rolling 3-month Average	-	0.15	-	0.15	-	-
	Calendar Quarter	See note 10	1.5	See note 10	1.5	-	-

Pollutant	Averaging Time	National Standards ¹				California Standards ²	
		Primary ^{3,4}		Secondary ^{3,5}		Concentration ³	
		ppm	µg/m ³	ppm	µg/m ³	ppm	µg/m ³
Visibility Reducing Particles ¹²	8 Hour	No Federal Standards				See note 12	
Sulfates	24 Hour					-	25
Hydrogen Sulfide	1 Hour					0.03	42
Vinyl Chloride ¹⁰	24 Hour					0.01	26

SOURCE: California Air Resources Board 2016

NOTES:

- National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.
- California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM₁₀, PM_{2.5}, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
- On December 14, 2012, the national annual PM_{2.5} primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24-hour PM_{2.5} standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM₁₀ standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
- To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
- On June 2, 2010, a new 1-hour SO₂ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO₂ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
- CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
- In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

National Emissions Standards for Hazardous Air Pollutants are emissions standards set by the EPA for an air pollutant not covered by National Ambient Air Quality Standards that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness. The standards for a particular source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology.

State

California Clean Air Act

The California Clean Air Act, signed into law in 1988, requires all areas of the State to achieve and maintain California ambient air quality standards by the earliest practical date. California's ambient air quality standards are established to protect the health of the most sensitive groups, apply to the same criteria air pollutants as the federal Clean Air Act, and also includes State-identified criteria air pollutants, which are sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride.

Table 5-3 shows the ambient air quality standards currently in effect for each of the federally identified criteria air pollutants, as well as, state recognized pollutants, such as sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride.

California Air Resources Board

The federal Clean Air Act gives states primary responsibility for directly monitoring, controlling, and preventing air pollution. The California Air Resources Board (CARB) is responsible for coordination and oversight of federal, state, and local air pollution control programs in California and for implementing the requirements of the federal and State Clean Air acts. The duties of CARB include coordinating air quality attainment efforts, setting standards, conducting research, and creating solutions to air pollution. CARB oversees regional or local air quality management or air pollution control districts that are charged with developing attainment plans for the areas over which they have jurisdiction. CARB grants these regional or local air districts explicit statutory authority to adopt indirect source regulations and transportation control measures, including measures to encourage the use of ridesharing, flexible work hours, or other measures that reduce the number or length of vehicle trips. Through its Mobile Sources Program, CARB has developed programs and policies to reduce emissions from on-road heavy-duty diesel vehicles. Specifically, the On-Road Heavy-Duty Diesel Vehicle Regulation requires diesel trucks and buses that operate in the State to be upgraded to reduce emissions. By January 1, 2023, nearly all vehicles must have engines certified to 2010 model year engines or equivalent (California Air Resources Control Board 2022b).

Air Quality Management Plans

The federal Clean Air Act requires areas with unhealthy levels of ozone, inhalable particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop plans, known as State Implementation Plans. State Implementation Plans are comprehensive plans that describe how

an area will attain national ambient air quality standards. State Implementation Plans are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. California grants air districts explicit statutory authority to adopt indirect source regulations and transportation control measures, including measures to encourage the use of ridesharing, flexible work hours, or other measures that reduce the number or length of vehicle trips. Local air districts prepare State Implementation Plan elements and submit them to CARB for review and approval. CARB forwards State Implementation Plan revisions to the EPA for approval and publication in the Federal Register.

California Air Toxics Program

CARB created a statewide air toxic program in the 1980s, and soon thereafter was the creation of the Toxic Air Contaminant Identification and Control Act of 1983 (AB 1807). The Toxic Air Contaminant Identification and Control Act established the California Air Toxic Program that was designed to lower all exposure to air pollutants. The Air Toxics “Hot Spots” Information and Assessment Act (AB 2588) adds on to AB 1807 by demanding an inventory for all air pollutants, a system where notices are provided to those who are unprotected by the air pollutant, and plans to lower these health risks. AB 1807 required CARB to implement standards for the ranking and control of the air pollutants. AB 1807 also requires CARB to use the data within the AB 2588 program. Gasoline dispensing facilities are subject to these standards.

Regional/Local

North Coast Air Quality Management District

The North Coast Air Quality Management District (“air district”) is a regional environmental regulatory agency whose jurisdiction is Humboldt, Del Norte, and Trinity counties.

In accordance with the Clean Air Act, CARB is required to designate regions of the state as attainment, non-attainment, or unclassified with regard to that region’s compliance with criteria air pollutants standards. An “attainment” designation signifies that pollutant concentrations do not violate the standard for that pollutant in that region. A “non-attainment” designation indicates that a pollutant concentration violated the standard at least once. An “unclassified” designation signifies that available data does not support either an attainment or non-attainment status.

As shown in [Table 5-4, North Coast Air Basin Attainment Status](#), the air district is listed as “attainment” or “unclassified” for all the federal and state ambient air quality standards with the exception of the state 24-hour particulate (PM₁₀) standard in Humboldt County only. The air district has not exceeded the federal annual standard for particulate matter during the last five-year period. Primary sources of particulate matter in the region are on-road vehicles (engine exhaust and dust from paved and unpaved roads), open burning of vegetation (both residential and commercial), residential wood stoves, and stationary industrial sources (factories).

All projects are subject to the air district’s rules and regulations in effect at the time of construction. Specific rules, regulations, and policies applicable to future projects within the Town Center would be summarized below.

Rule 102 – Required Permits

Under Rule 102, any project that is a new source of air contaminants, including an indirect source, may be required to obtain an Authority to Construct Permit from the Air Pollution Control Officer, which specifies the location and design of such new source and incorporates necessary permit conditions to ensure compliance with applicable Rules and Regulations and State and Federal Ambient Air Quality Standards.

Table 5-4 North Coast Air Basin Attainment Status

Pollutant	California Standards	National Standards
O ₃	Attainment	Attainment
PM ₁₀	Non-attainment	Unclassified
PM _{2.5}	Attainment	Attainment
CO	Attainment	Attainment
NO ₂	Attainment	Attainment
SO ₂	Attainment	Attainment
Pb	Attainment	Attainment

SOURCE: California Air Resources Control Board 2022

Rule 104 – Prohibitions

Rule 104 states that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the health, comfort, repose or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.” Specifically, Section D of Rule 104 limits fugitive dust emission from handling, transporting, or open storage of materials and requires reasonable precautions to prevent particulate matter from becoming airborne.

Rule 110 – New Source Review and Prevention of Significant Deterioration

Rule 110 establishes preconstruction review requirements for new and modified stationary sources of air pollution for use of best available control technology, analysis of air quality impacts, and to ensure that the operation of such sources does not interfere with the attainment or maintenance of the California Ambient Air Quality Standards or National Ambient Air Quality Standards.

Humboldt County General Plan

The Humboldt County General Plan, adopted October 23, 2017, contains several policies that directly pertain to air quality, including the following:

Policy AQ-P2: Reduce Localized Concentrated Air Pollution. Reduce or minimize the creation of “hot spots” or localized places of concentrated automobile emissions.

Policy AQ-P4: Construction and Grading Dust Control. Dust control practices on construction and grading sites shall achieve compliance with the air districts fugitive dust emission standards.

Policy AQ-P5: Air Quality Impacts from New Development. During environmental review of discretionary permits, reduce emissions of air pollutants from new commercial and industrial development by requiring feasible mitigation measures to achieve the standards of the air district.

Policy AQ-P6: Buffering Land Uses. During environmental review of discretionary commercial and industrial projects, consider the use of buffers between new sources of emissions and adjacent land uses to minimize exposure to air pollution.

Standard AQ-S1: Construction and Grading Dust Control. Ground disturbing construction and grading shall employ fugitive dust control strategies to prevent visible emissions from exceeding the air districts regulations and prevent public nuisance.

Standard AQ-S3: Evaluate Air Quality Impacts. During environmental review of discretionary projects, evaluate new commercial and industrial sources of emissions using analytical methods and significance criteria used, or recommended by, the air district.

5.3 Air Quality Thresholds of Significance

CEQA Guidelines Appendix G is a sample initial study checklist that includes a number of factual inquiries related to the subject of air quality, as it does on a whole series of additional environmental topics. Lead agencies are under no obligation to use these inquiries in fashioning thresholds of significance on the subject of air quality impacts, or on any subject addressed in the checklist. Rather, with few exceptions, CEQA grants agencies discretion to develop their own thresholds of significance. Even so, it is a common practice for lead agencies to take the language from the inquiries presented in Appendix G and to use that language in fashioning thresholds.

For the purposes of this EIR, a significant impact related to air quality would occur if implementation of the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard; and
- Expose sensitive receptors to substantial pollutant concentrations.

Issues Not Discussed Further in this Section

The Appendix G questions on the subject of air quality include a question for which no further discussion is needed. The question is as follows:

- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The proposed residential, commercial, and office land uses generally do not support development types that are a significance source of odors. Common, potentially significant sources of odors include landfills, waste transfer stations, wastewater treatment plants, composting facilities, etc. No further discussion of this issue is required.

Air District Significance Threshold Criteria

Air Quality Plan Consistency

The primary purpose of an air quality plan is to achieve attainment with federal and state air quality standards. The air district has the responsibility for assuring that national and state ambient air quality standards are attained and maintained in the air basin. CEQA requires that proposed projects be analyzed for conflicts with applicable air quality plans. An air quality plan describes air pollution control strategies to be implemented in an air district where the air basin is classified as being in non-attainment with standards for one or more air pollutants. The main purpose of an air quality plan is to identify measures needed to bring the air basin into compliance with the requirements of federal and state ambient air quality standards.

Attainment status for the air district is described in greater detail in Section 5.2, Regulatory Setting, of this report. The air basin is in nonattainment for both the federal and state standards for PM₁₀ emission. The air basin is in attainment with all other State and Federal ambient air quality standards. On May 11, 1995, the district released the Particulate Matter (PM₁₀) Attainment Plan (“air quality plan”), which presents information on the nature and causes of exceedances of the PM₁₀ standards, and identifies cost-effective measures to reduce ambient PM₁₀ levels. The air quality plan contains control strategies for transportation and open burning, that if applied, would reduce related PM₁₀ emissions. The applicable air quality plan control measures include:

Transportation Control Measures:

- Public transit;
- Traffic flow improvements; and
- Bicycling programs.

Land Use Measures:

- Land uses that enable people to walk, bike, or use public transportation for shopping or employment rather than relying on their car.

Open Burning Measures:

- Encourage use of enhanced wood stoves; and
- Prohibition of sale of installation of wood burning stoves in new homes unless they are EPA certified or equivalent.

Implementation of the Town Center Q-Zone as a plan project would result in a significant impact if it were to omit direction that requires consistency with the control measures listed above.

Significance Threshold Criteria Air Pollutant Emissions

In determining whether a plan or project has significant air quality impacts, planners typically reference local air district thresholds of significance as part of the CEQA process. The air district has not formally adopted criteria air emissions thresholds of significance for land use projects. The air district does utilize Best Available Control Technology emission rates for stationary emissions sources as defined and listed in air district Rule and Regulations, Rule 110 - New Source Review and Prevention of Significant Deterioration, Section 5.1 (North Coast Air Quality Management District 2015, but this regulation is not applicable to land use projects whose emissions inventories are typically dominated by emissions from transportation sources.

In lieu of local or regional thresholds of significance for criteria air emissions from land use projects, the County is electing to apply threshold of significance guidance provided by the adjacent Bay Area Air Quality Management District (BAAQMD). In 2022, BAAQMD's Board of Directors adopted the *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans* (Bay Area Air Quality Management District 2022). The "CEQA Guidelines" provide recommendations for how a lead agency can evaluate, measure, and mitigate air quality impacts from constructing and operating land use projects and from anticipated development from proposed plans, such as a general plan or specific plan.

The proposed project is considered a plan, as it provides direction for how the Town Center site is to build out over a 20-year period or longer, with implementation occurring through a program of future individual development projects. BAAQMD guidance for plan-level thresholds

of significance apply in specific circumstances when development is proposed over a 20-year or longer period. For criteria emissions impacts of a plan to be found less than significant, the plan must satisfy two requirements: 1) the plan must be consistent with current air quality plan control measures; and 2) the projected growth rate of vehicle activity in VMT or vehicle trips for the plan must be less than or equal to the projected population growth rate. If the plan meets these two requirements, future individual projects proposed to implement the plan, if consistent with plan land use and development density, would have less than significant criteria air pollutant impacts.

5.4 Analysis, Impacts, and Mitigation Measures

This section includes information regarding air quality issues that are relevant to the proposed project based on the thresholds of significance described above.

Conflict with Air Quality Plan

IMPACT 5-1	Conflict with the Air Quality Plan	Less Than Significant with Mitigation
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The proposed project would result in new sources of PM₁₀ emissions, primarily associated with transportation. There are a number of proposed features outlined in the in the Q-Zone regulations, particularly in Section 4, Connectivity, that if implemented would reduce transportation PM₁₀ emissions and that are control measures identified in the air district’s air quality plan. Proposed Q-Zone design features include:

- **4.1.3 Bicycle and Pedestrian Connections.** On-street and off-street bicycle trails and pedestrian connections including:
 - **4.1.3.1** East-West Trail linking McKinleyville Avenue on the west with Pierson Park on the east, running through the existing shopping center and crossing Central at Gwin. This will connect the open space on the west with the park on the east;
 - **4.1.3.2** North-South connector linking the Mid-Town trail; and
 - **4.1.3.3** Class I (separated) bicycle path along Hiller connecting McKinleyville Ave and Central.
- **4.1.4 Transit Facilities.** An enhanced transit facility located with convenient access to Central Avenue to provide simultaneous loading space for multiple buses, bike lockers, and if grant or other funding is available space for park and ride. The facility must be constructed and operational before 50 percent Town Center site is built out.
- **5.2.3.1** A minimum of five bicycle parking spaces shall be provided for any mixed use or commercial development project of more than 10,000 square feet.

The noted Q-Zone land use design features are intended to reduce mobile source air emissions, including PM₁₀, by providing and/or promoting mobility choices that enable people to walk, ride or use public transit for shopping or employment rather than relying on personal vehicles. Therefore, the Q-Zone requirements are aligned with the associated air quality plan control measures.

The air quality plan also encourages prohibiting wood burning stoves or fireplaces in new multi-family dwelling units unless they are EPA certified or equivalent devices, such as natural gas or electric fireplace inserts. Due to the prohibition on natural gas infrastructure in new development identified in mitigation measure 9-1 in Section 9.0, Greenhouse Gas Emissions, natural gas fire places would also be prohibited. In 2020, the EPA updated its New Source Performance Standards, which outline objectives for new residential wood burning devices, including updated emission limits that reflect the current best systems of emission reduction (United States Environmental Protection Agency 2020). All new wood heating appliances subject to the New Source Performance Standard for New Residential Wood Heaters under the Clean Air Act offered for sale in the United States are required to meet these emission limits. The Office of Enforcement and Compliance Assistance certifies all wood burning devices subject to the 2020 New Source Performance Standards for Wood Heaters and maintains lists of all approved appliances.

The Q-Zone design standards do not include requirements or specifications for wood burning devices. Therefore, the following mitigation measure is required to ensure that future development within the project site is consistent with the applicable air quality plan control measure.

Mitigation Measure

- 5-1 No wood burning fireplaces are permitted within future residential units. If wood burning heaters/stoves are planned, these shall comply EPA’s list of certified wood heaters as identified in the 2020 New Source Performance Standard for New Residential Wood Heaters.

Implementation of mitigation measure 5-1, in combination with the Q-Zone design features regarding bicycle, pedestrian and transit design features, would ensure that future development within the project site will conform to the applicable air quality plan control measures. Therefore, the project would not conflict with the applicable air quality plan.

Criteria Air Pollutants Emissions

IMPACT 5-2	Generation of Criteria Air Emissions	Less Than Significant
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As stated above in Section 5.3, Thresholds of Significance, BAAQMD’s CEQA guidelines provide direction for determining whether a proposed plan for development will have significant criteria air pollutant impacts. The two plan level determination requirements are described below.

Consistency with Air Quality Plans

As discussed above under Impact 5-1, the Q-Zone design requirements for improved and expanded bicycle/pedestrian trail systems and new transit facilities and mitigation measure 5-1 assure that the project is consistent with the applicable air quality plan.

Rate of VMT/Vehicle Trip Increase Versus Rate of Population Increase

Proposed long-range plans must demonstrate that the projected growth rate of vehicle activity in VMT or vehicle trips under the plan would be less than or equal to the projected population growth rate to have less than significant criteria air emission impacts. The vehicle activity and population growth rates are measured in terms of percent growth from baseline year levels. Since future development within the site would consist of both residential and non-residential (commercial/office) uses, service population is used as an indicator of growth for comparison to the increase in vehicle trip volume. The service population is the sum of projected new project residents and new project employees.

For purposes of this analysis, the BAAQMD threshold of rate of change in vehicle activity (as measured in vehicle trip volume), per service population is used to assess the criteria air emissions impacts of the project. [Table 5-6, Rate of Vehicle Trip Volume per Service Population](#), shows this information for existing baseline conditions and projected 2045 project buildout conditions.

The project would result in an increase in both annual trip volume and service population. However, the cumulative year rate of vehicle trips per service population would decrease by approximately 31 percent relative the baseline rate. Given that the projected growth rate of vehicle activity under the plan would be less than under baseline conditions, the project would have a less-than-significant impact from generation of criteria air emissions.

Table 5-5 Rate of Vehicle Trip Volume per Service Population

Category	Base Year (2024)	Cumulative Year (2045)	Change	Percent Change
Daily Trip Volume ¹	10,997	47,428	36,431	331
Service Population ²	1,535	9,557	8,022	523
Trips per Service Population ³	7.16	4.96	-2.20	-31

SOURCE: W-Trans 2025, EMC Planning Group 2025

NOTES:

1. Daily trip volumes under base year and cumulative year conditions provided by W-Trans.
2. Cumulative year service population is derived from data in Section 4.0, Project Description. Existing service population data is from W-Trans using the Humboldt County Travel Demand Model.
3. A negative value represents a decrease in the cumulative year compared to baseline conditions.

Project Design Features that Reduce Criteria Emissions

Several development design features included in the Q-Zone regulations would function to reduce air emissions. These features would reduce VMT from the project and associated criteria emissions from mobile (transportation) sources. To estimate these reductions, the California Air Pollution Control Officers Association (CAPCOA) *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (California Air Pollution Control Officers Association 2021) was referenced. This discussion is provided for informational purposes only, as the project impact from criteria air emissions is less than significant as described above.

The CAPCOA Handbook provides methods to quantify GHG emissions reductions from a specified list of transportation GHG reduction measures. Transportation source measures in the Handbook are largely designed to reduce VMT, given that mobile source transportation GHG emissions are strongly correlated to VMT. Therefore, the transportation GHG reduction measures are a reasonable proxy for VMT reductions and VMT reductions would have the co-benefit of reducing criteria air emissions from mobile sources. The required transit facilities, and pedestrian/ bicycle trail network design features included in the Q-Zone regulations correlate to transportation measures T-3, T-17, T-18A, and T-19 in the CAPCOA Handbook as listed and described in [Table 5-5, Applicable CAPCOA Measures and Applied VMT Reductions](#). The CAPCOA Handbook includes descriptions of each measure, conditions under which each is applicable, and formulas for calculating VMT reductions from each. The formulas were utilized to derive the VMT reductions identified in Table 5-5, using data inputs described in the table. A VMT reduction of 20.7 percent is forecast with implementation of the applied measures (T-3, T-17, T-18A, and T-19). These measures are commonly considered fundamental elements of transportation demand strategies intended to reduce vehicle trip volumes and VMT from projects. The Q-Zone regulation requiring bicycle parking spaces for commercial or mixed use

development was considered as a possible VMT reduction measure. However, no reduction has been assigned to this project design feature. While it is identified as a VMT reduction measure, reductions from it are not quantified in the CAPCOA Handbook.

Table 5-6 Applicable CAPCO Measures and Applied VMT Reductions

CAPCOA Measures and VMT Reduction Value	Justification for VMT Reduction
T-3. Provide Transit-Oriented Development (14.95 percent reduction)	To qualify as a Transit-Oriented Development, the development must be within a 10-minute walk (0.5 miles) of a high frequency transit station (either rail, or bus with headways less than 15 minutes). A new transit facility will be constructed within the site, with completion required by the time 50 percent of the site is built out. Existing transit service with 30-minute headways is currently available at the project site. The Humboldt County Association of Governments is implementing a micro-transit bus travel service between McKinleyville and Arcata with 15-minute headways that will be in place prior to the end of 2024. Both services will utilize the planned transit center once it is complete. The combination of these two services will meet the noted 15-minute headway criterion. Given the size of the project site, all future uses would be within 0.5 miles of the required transit station. Using the VMT reduction formula for this measure, and assuming regional percentage public transportation trips (2.9 percent) and regional percentage of personal vehicle trips (95.04 percent) for the local area as identified in the CAPCOA measure, an estimated VMT reduction of 14.95 percent is assumed.
T-17. Provide Pedestrian Network Improvement (5.4 percent reduction)	VMT reduction applied for this measure is associated with the expansion of sidewalk coverage, including the construction of new sidewalks, as well as improving existing degraded or substandard sidewalks. Google Earth imagery was used to estimate the total length of the existing pedestrian network, as well as the extent of proposed new and improved sidewalks based on Map 3, Bike and Pedestrian Connections, in the McKinleyville Town Center Q-Zone. The project site currently includes approximately 2.5 miles of a disjointed pedestrian network with existing sidewalks along Railroad Drive, Central Avenue, Picket Road, Gwin Road, and Dahlia Road. The proposed project includes approximately 5.2 miles of pedestrian improvements, including North-South connector linking the Mid-Town trail and East-West Trail linking McKinleyville Avenue on the west with Pierson Park on the east, the construction of a new sidewalk along Hiller Road, and the replacement of the existing sidewalk along Railroad drive. Using the VMT reduction formula for this measure, the default values for the measure and the change in total length of sidewalks, a 5.4 percent reduction is assumed.
T-18-A. Construct or Improve Bike Facility (0.2 percent reduction)	To qualify for this reduction, a plan must include either Class I, II, or IV bicycle lanes. The proposed plan incorporates bike lane improvements, including a Class I trail North-South connector linking the Mid-Town trail and East-West Trail linking McKinleyville Avenue on the west with Pierson Park on the east, as well as new bikeways along Central Avenue and Hiller Road. Using the VMT reduction formula for this measure and the default adjustment factors for active transportation (0.0038), proximity to key facilities (0.003), facility type (1.54), and the regional average one way bike trip lengths (2.9 miles) and vehicle trip lengths (10.9 miles) identified in the CAPCOA Handbook, a total VMT reduction of 0.2 percent is assumed.

CAPCOA Measures and VMT Reduction Value	Justification for VMT Reduction
T-19. Expand Bikeway Network (0.16 percent reduction)	The construction of new bikeways along Central Avenue and Hiller Road, as well as on-site bicycle paths qualifies for additional VMT reductions associated with the expansion of the existing bike network. Google earth imagery was used to measure the approximate length of existing and proposed bicycle lanes within the project site. Currently, there is approximately 1 mile of existing Class II bicycle lane on either side of Central Avenue. As measured in Google Earth, the proposed project would incorporate approximately 5.2 miles of new bike lane improvements. Using the VMT reduction formula for this measure and given the average regional percentage and length of one-way bicycle trips (0.56 percent and 2.9 miles) and one-way vehicle trips (95.04 percent and 10.9 miles) identified in the CAPCOA Handbook, a total VMT reduction of 0.16 percent is assumed.

SOURCE: California Air Pollution Control Officers Association 2021, EMC Planning Group 2024

Table 5-5 shows that the project design features could reduce VMT by about 20 percent. This would translate to a significant air quality co-benefit by substantially reducing mobile source criteria air emissions. Mobile source criteria emissions would be the most substantial component of the total project air emissions inventory.

Life Plan Humboldt

The employment growth resulting from the Life Plan Humboldt project is part of both the cumulative calculation of service population and vehicle trip volume generation modeled for cumulative conditions. Consequently, its contribution to criteria air emissions impacts as presented above are considered. The Life Plan Humboldt project would have no new or more severe criteria air quality impacts than assumed for the project as a whole. Design features that are applicable to the project as a whole are also applicable to the Life Plan Humboldt project.

Construction Phase Toxic Air Contaminants

IMPACT 5-3	Operation of Construction Equipment Would Expose Sensitive Receptors to Toxic Air Contaminants	Less Than Significant with Mitigation
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New development within the project site has the potential to expose existing and future sensitive receptors to localized health risks associated with TAC emissions from construction equipment exhaust. Existing sensitive receptors located adjacent to or in the vicinity of the project site include the residential developments north of Railroad Drive between McKinleyville Avenue and Central Avenue, a senior living development and residential developments adjacent to the south boundary of the site, and a handful of residential units adjacent to the eastern project boundary north of Picket Road. McKinleyville Middle School is located at the southeast corner of the Railroad Drive/ Central Avenue intersection.

Temporary and limited localized TAC emissions would be generated from diesel equipment used to construct future individual projects and associated infrastructure. Emissions from construction diesel engines are subject to control under regulations adopted by both the California Air Resources Board and U.S. EPA. U.S. EPA promulgated emission standards for off-road engines in 1998, with the California Air Resources Board adopting parallel standards in 2000. In 2004, Tier 4 emission standards were adopted and were phased in for new engines between 2011 and 2014. In 2007, CARB adopted an off-road equipment regulation to accelerate reductions of NO_x and diesel PM from existing off-road engines. Beginning in 2012 and through 2023, the off-road regulation requires operators of older equipment to either install abatement devices, upgrade to Tier 3 and eventually Tier 4 engines, or to retire older equipment.

Construction emissions are expected to occur intermittently throughout the long-term site buildout period. While construction emissions are expected to increase due to the increase in activity, these will somewhat be offset as the rate of emissions decrease due to increased use of newer construction equipment and motor vehicles. Newer equipment is subject to newer, more stringent, regulations that decrease the rate of emissions and introduce a greater fraction of zero emission engines. Depending on the type, size, and/or location of future individual projects, exposure of existing off-site receptors and future on-site receptors to TACs from heavy equipment diesel exhaust during construction is a potentially significant impact.

Implementation of the following mitigation measure would ensure that the health risks from potential exposures to construction TAC emissions would be reduced by requiring that best management practices and to ensuring compliance with diesel engine regulations designed to reduce diesel emissions.

Mitigation Measure

- 5-4 All construction plans shall include the following requirements to reduce TAC emissions during construction:
- a. Idling of construction equipment and heavy-duty diesel trucks will be avoided where feasible, and if idling is necessary, it will not exceed three minutes;
 - b. All construction equipment will be maintained and properly tuned in accordance with the manufacturer's specifications and will be checked by a certified visible emissions evaluator.

Implementation of this mitigation measure would reduce exposure of sensitive receptors to construction TACs to a less-than-significant level by limiting idle times, and restricting non-compliant equipment.

Life Plan Humboldt

Construction air quality effects of the Life Plan Humboldt project would be similar to effects described above for construction within the Town Center project site as a whole. Consequently, the Life Plan Humboldt project would have no new or more severe construction air quality impacts than assumed for the project as a whole. Mitigation measures that are applicable to the project as a whole are also applicable to the Life Plan Humboldt project as a means to reduce its construction emissions impacts.

Operational Toxic Air Contaminants

IMPACT 5-4	Exposure of Sensitive Receptors to Operational Sources of Toxic Air Contaminants	Less Than Significant
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As previously stated, existing sensitive residential receptors are located directly adjacent to the project site and along the roadways that border the site. Future sensitive receptors would include residents living within the project site and residents of the planned Life Plan Humboldt project. Existing sensitive receptors could be exposed to TACs from new stationary sources within the site, and/or from TACs from traffic generated by future development within the site. Future residential receptors within the site could be exposed to TACs from new stationary sources within the site and/or from traffic operating on U.S. Highway 101 and/or local roadways.

Exposure to TAC sources is generally of concern where sensitive receptors are or would be located within 1,000 feet of the TAC source. In the absence of specific direction from the air district on evaluating health risks from TACs, the 1,000-foot reference distance is taken from health risk analysis guidance provided in Chapter 5 of BAAQMD's 2022 CEQA Guidelines.

Stationary Source TACs

Residential uses are not commonly assumed to be stationary sources of TACs. However, operations of non-residential uses may have the potential to produce TAC emissions depending on the use type. [Table 5-7, Permitted Non-Residential Land Uses](#), lists non-residential land use types that would be permitted within the site. None of these are commonly associated with operations or processes that produce notable sources of TACs as may be the case with heavy service commercial uses or industrial uses. Stationary TAC sources from allowed uses would typically be limited to back-up diesel generators, which require a permit from the air district. Whether diesel generators or other ancillary sources of stationary TACs will be proposed as part of one or more future individual projects cannot be known at present. Diesel generators are subject to CARB's Stationary Diesel Airborne Toxics Control Measure and require permits from the air district, since they commonly are equipped with engines larger than 50 horsepower. Best Available Control Technology for Toxics requirements would apply that would limit diesel particulate matter emissions. As part of the air district permit requirements for toxics screening

analysis, the engine emissions would have to meet best available control technology for toxics standards and pass the toxic risk screening level of less than ten in a million.

Table 5-7 Permitted Non-Residential Land Use

Public Gathering Use Types
<ul style="list-style-type: none"> • Public Recreation • Farmers/Seasonal Market • Multi-Use Plaza Areas • Amphitheaters • Pocket Parks
Commercial Use Types
<ul style="list-style-type: none"> • Retail sales and services • Artisan’s workshop or handcraft manufacture³ • Micro-brewery/Winery/Distillery • Restaurants • Pop-Up Businesses (At locations designed for such activity) • Bank, financial services • Office: Business, administrative, governmental, and medical
Civic Use Types
<ul style="list-style-type: none"> • Post Office • Community Assembly • Churches • Civic buildings • Library • Private and Public Schools • Art galleries • Transit Centers

SOURCE: Humboldt County 2024

Other potential sources of TACs are also required to comply with air district regulations pertaining to permitting such sources. The air district would evaluate the potential for such sources to create health risks prior to issuing a permit. Projects that receive such permits are not considered to have a potentially significant community health risk impact. Consequently, exposure of planned future on-site sensitive receptors to new TAC sources from the project site, and exposure of existing off-site sensitive receptors to stationary source TACs from such development, are not expected to be sources of a potentially significant public health risk or impact.

Transportation Source TACs

TACs from Heavy Duty Truck Trips

Health risks from exposure of sensitive receptors to TACs generated by transportation sources can also be a concern. One source of risk arises where sensitive receptors are or would be located along roadways onto a project that generates a large volume of diesel-powered heavy truck trips would distribute such trips. Diesel-powered vehicles produce diesel particulate matter (DPM) that is a known carcinogen. The concern also arises where receptors are located near roadways that carry a higher number of vehicle trips due to the potential for exposure to small particulate matter (PM_{2.5}).

The primary existing transportation source of TACs in the vicinity with potential to affect future on-site receptors is traffic on U.S. Highway 101. Per BAAQMD guidance, transportation-source TACs may be of concern when receptors are located adjacent to roadways that carry more than 1,000 daily heavy-duty truck trips. According to the California Department of Transportation, traffic volumes on U.S. Highway 101, including heavy-duty truck trips, through McKinleyville range between 11,300 to 19,300 average daily trips (California Department of Transportation 2017). This volume is likely to increase over the duration of the project buildout period, including from traffic contributed by the proposed project. However, U.S. Highway 101 is located approximately 1,500 feet from the nearest boundary of the project site - beyond the distance at which TAC exposure might otherwise be a potential concern. Consequently, exposure of future on-site sensitive receptors from TACs generated by traffic on the highway would not be a source of a significant health risk to or significant impact on those receptors.

As noted above, individual retail and office uses that would be permitted within the site would not generate notable volumes of heavy-duty truck traffic. In an urban land use scenario, large volumes of heavy-duty truck trips are typically associated with heavy commercial and industrial uses such as warehouses, distribution centers, manufacturing facilities, truck stops, construction storage yards, etc. The proposed project is not expected to be a source of potentially significant health risk from this source.

Life Plan Humboldt

Like other future anticipated uses for the project site, the Life Plan Humboldt project is not anticipated to be a source of stationary or transportation TACs, that at a project level, could be anticipated to cause significant impacts. Its potential to be adversely affected by existing and potential future sources of transportation source TACs is similar to that evaluated above for other sensitive receptors. The Life Plan Humboldt project would have no new or more severe health risk impacts than assumed for the project as a whole.