# Chapter 19. Air Quality Element

## 19.1 Introduction

**Purpose** The Air Quality Element is an optional Element of the General Plan. The purpose of this Element is to describe the existing air quality, sources of air pollution, recommended strategies for improving air quality (e.g. strategies affecting the density and location of land uses), transportation and circulation system, and overall community design.

## 19.2 Background

As a whole, air quality in this County is better than other parts of the State. Local measurements by the North Coast Unified Air Quality Management District ("the District") reveal that the County meets all federal standards for air quality and all State standards except for one pollutant – airborne particles that are ten microns in diameter and smaller ($PM_{10}$).

Emissions of $PM_{10}$ come from a number of sources:

- Stationary Sources include non-mobile sources such as power plants, refineries, and manufacturing facilities;
- Areawide Sources include sources where the emissions are spread over a wide area, such as consumer products, fireplaces, construction and demolition, road dust, and farming operations;
- Mobile Sources include both "On-Road Sources" (automobiles, motorcycles, and trucks) and "Off-Road Sources" (small off-road engines and equipment, off-road recreational vehicles, farm and construction equipment, forklifts, locomotives, commercial marine vessels, and marine pleasure craft); and,
- Natural Sources include biological and geological sources such as wildfires, windblown dust, and biogenic emissions from plants and trees.

Stationary sources of emissions are controlled in the General Plan by policies and standards that make air quality a consideration in approval of new development. Environmental review of new development by the County ensures compliance with State air quality laws, which reduces air quality impacts. Presently, the County also coordinates review of one type of project with the District outside of environmental review: demolition of commercial structures that may involve asbestos.

Financial and temporal impacts on developers from County review of stationary source emissions are mitigated by governance policies that encourage coordination between the County and Air Quality Management District. Close interagency coordination will minimize processing delays and deliver more predictable outcomes for new development.

Areawide and mobile source emissions can be reduced in the General Plan by policies that target specific sources. Transportation policies could reduce area wide $PM_{10}$ levels by reducing both the number of vehicle miles traveled and the number of vehicle trips. Policies that encourage use of vehicles with low emissions can reduce $PM_{10}$ from motor vehicles. Also residential use emissions could be reduced by restricting residential fuel combustion in new development.

## 19.3 Goals and Policies

### Goals

**AQ-G1.** Promote the public health, safety, welfare, and environmental quality of the community with improved air quality by:

- meeting State and federal air quality standards;
- reducing emissions of $PM_{10}$;
- limiting emissions from new stationary sources of air pollution consistent with State requirements; and
- buffering existing development from new stationary sources of air pollution consistent with State requirements.

### Policies

#### Reducing $PM_{10}$ Emissions From New Mobile and Areawide Sources

**AQ-P1.** Through land use and transportation policies, encourage mixed use development, a compact development pattern in areas served by public transit, and alternative modes of travel.

**AQ-P2.** Through transportation policies, reduce or minimize the creation of "hot spots" or localized places of concentrated automobile emissions.

**AQ-P3.** Minimize $PM_{10}$ emissions from new fireplace inserts and new woodstoves.

**AQ-P4.** Minimize $PM_{10}$ emissions from construction sites for projects involving environmental review and new multifamily residential, commercial and industrial developments resulting in ground disturbance of one acre or more.

**AQ-P5.** Review $PM_{10}$ emissions monitoring results from the Air Resources Board and implement new land use and transportation policies and regulatory controls to meet State and federal $PM_{10}$ emissions standards as necessary.

#### Reducing Localized Air Quality Impacts From New Stationary Sources

**AQ-P6.** Reduce emissions of air pollutants from new commercial and industrial development by requiring feasible, workable, monitor able and cost effective mitigation measures based on standards of the District during environmental review of discretionary permits.

**AQ-P7.** Establish buffers between new commercial and industrial sources of emissions and adjacent land uses on a project-by-project basis according to the standards of the District during environmental review of discretionary permits.

**AQ-P8.** Implement interagency governance policies to encourage coordination with the District early on in the permit review process to identify expected outcomes and minimize delays for projects involving environmental review and commercial demolition projects that may involve removal of asbestos.

## 19.4 Implementation Measures

**Reducing $PM_{10}$ Emissions From New Mobile and Areawide Sources**

**AQ- IM1.** Require new fireplace inserts and new woodstoves be certified by the Environmental Protection Agency for air quality standards through the building permit process.

**AQ- IM2.** Require implementation of dust suppression measures in all projects involving environmental review and all new multifamily residential, commercial and industrial developments resulting in ground disturbance of one acre or more.

**AQ-IM3.** Review $PM_{10}$ emissions monitoring results from the Air Resources Board with future General Plan Housing Element Updates, and implement new land use and transportation policies and other regulatory controls to meet State and federal $PM_{10}$ emissions standards.

**Reducing Localized Air Quality Impacts From New Stationary Sources**

**AQ-IM4** When establishing buffers between new commercial and industrial sources of emissions and adjacent land uses during environmental review of discretionary projects, use the California Air Resources Board's "Air Quality and Land Use Handbook: A Community Health Perspective", and the District's implementation guidelines.

**AQ-IM5.** During environmental review of discretionary projects, evaluate new commercial and industrial sources of emissions using analytical methods and significance criteria approved by the District.

**AQ-IM6.** Expand performance standards for new Cottage Industries to prohibit air emissions in amounts greater than normal for the neighborhood.

**AQ-IM7** Encourage interagency coordination with the District with measures in the Governance Element.

**AQ-IM8** Update the General Plan with new State standards for Greenhouse Gas emissions when they become available.

NOTE: the section below will fall out of the 'final' version found in the GP, but will be critical to the process of review

# 19.5 Staff Analysis and Alternatives

## State and Federal Requirements

Humboldt County is in the North Coast Air Basin, which consists of the counties of Humboldt, Del Norte, and Trinity. Air Quality monitoring has been conducted in the North Coast Air Basin since 1982 when the North Coast Unified Air Quality Management District was formed. The District collects data on the following air pollutants: total organic compounds (TOG); reactive organic compounds --- those which react with other emissions to form ozone (ROG); carbon monoxide (CO); nitrogen oxides ($NO_X$); sulfur oxides ($SO_X$); and particulate matter (PM), from three monitoring stations in Eureka.

The District measures air quality for the County as a whole by classifying areas as either "attainment" or "nonattainment" for these air pollutants based on whether or not the national and State standards have been met. The County meets all federal standards for air quality, and we meet all State standards except for one pollutant – airborne particles that are ten microns in diameter and smaller ($PM_{10}$). The State standard is 20 micrograms per cubic meter, and as shown in the table below, the annual average for Humboldt County fluctuated between 15.9 and 21.8 micrograms per cubic meter between the years 1996 through 2001, which is the most recent data available.

| Year | $PM_{10}$ Level* |
|---|---|
| 1996 | 19.0 |
| 1997 | 21.0 |
| 1998 | 15.9 |
| 1999 | 19.9 |
| 2000 | 21.8 |
| 2001 | 21.3 |

* Data is presented in micrograms per cubic meter

The State Air Resources Board projects that the County will become further out of compliance with State $PM_{10}$ standards in the future. Forecasts by the Air Resources Board show $PM_{10}$ levels rising from 38.68 tons per day in 2005 to 40.41 tons per day in 2020, which is an increase of 4.5% in this 15 year time period. Most of the projected increase in $PM_{10}$ levels is attributable to increases in emissions from ships and commercial boats (40.0%), unpaved road dust (29%), and paved road dust (27%).

As a non-attainment area, California and Federal Clean Air Acts require the District to prepare an Air Quality Management Plan for this class of pollutant. The "$PM_{10}$ Attainment Plan" addresses the status of $PM_{10}$ air quality standards compliance, emission sources, attainment goals, and control strategies to be pursued toward compliance. These strategies include:

- Transportation control measures, including fostering public transit use, ride-share programs, park and ride lots, vehicle buy-back programs, smoking vehicle abatement, traffic flow improvements, and bicycling programs;
- Land use measures, including planning policies and zoning regulations to foster walking, cycling, and the use of public transit;
- Open burning measures, including management of agricultural and forestry related burning, restrictions on residential waste burning and controls on woodstoves and their heating efficiencies, requiring new construction to install only USEPA-certified or equivalent models, providing incentives for replacing non-certified stoves, and limitations on use-days based on smoke opacity and air quality;
- Public education efforts; and,
- Promoting home weather-stripping to reduce the need for space heating and cooling.

Alternatives in this preliminary hearing draft include these programs with the exception of: management of agricultural and forestry related burning; restrictions on residential waste burning; limitations on use-days based on smoke opacity and air quality; and, public education efforts including promoting home weather-stripping to reduce the need for space heating and cooling. Policies and programs to address these additional components of the Attainment Plan could be added.

Localized air pollution in the County from new commercial and industrial development projects is controlled by permit requirements and enforcement mechanisms of the District.

New State Standards for Greenhouse Gas Emissions

In an effort to help curb global warming, new State laws regulating Greenhouse Gases (GHG's) were enacted in 2006 which will affect the County in the future. Assembly Bill 32 requires the State adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in GHGs. The new legislation will cap emission of GHG's at 1990 levels by the year 2020. A Plan policy that folds into the General Plan future State requirements to reduce emissions of GHG's to 1990 levels is presented.

## Background Information Developed For the General Plan Update

Existing Framework Plan Policies and Standards

In addition to complying with State and federal standards, earlier phases of the General Plan Update revealed two significant concerns: backyard trash burning; and, toxic air pollution from existing (localized) sources.

Backyard Trash Burning

The Critical Choices report documented considerable concern over back yard trash burning. Air pollution from residential uses are regulated directly by the District through issuance of permits and enforcement measures. Burn permit requirements allow burning of dry natural vegetation grown on site that is reasonably free of dirt, soil and visible surface moisture.

Localized Sources of Air Pollution

The Natural Resources and Hazards Report identified four main sources of toxic air contaminants in the County: Fairhaven Power Company (Fairhaven), Simpson Timber Company (Korbel); Louisiana Pacific Corp. (Somoa); and, Pacific Lumber Company (Scotia).

Pursuant to an Order for Abatement issued by the District's Hearing Board, the Fairhaven Power Company recently received approval for installation of an electrostatic precipitator (ESP) on the existing lime kiln which will replace the currently operating venturi scrubber as an emission control device.

## Staff Recommendations

Presently the Framework Plan protects air quality by standards to ensure coordination with the District. The existing Framework Plan recognizes the District's primary role in achieving air quality goals, thus policy direction is limited to ensuring coordination between the goals of the District and the General Plan. This policy is proposed to be modified.

The Framework Plan also identifies the use of wood as a home heating fuel as a potential air pollution problem and suggests that in the future, the County may want to take measures to reduce emissions from wood stoves by limiting the number of open fireplaces in new construction and encourage the use of cleaner and more efficient air tight woodstoves. This policy option is modified to be more effective and included as a policy option for *Alternative A*.

Implementation measures to minimize air quality impacts under the existing General Plan are limited to zoning requirements for cottage industries that prohibit smoke or odors to a degree greater than that normal for the neighborhood. A policy option modifies this measure by limiting air emissions in new cottage industries.

Stationary Sources of Air Pollution

Policies are presented to require new development meet State air quality standards. Governance Element policies seek to improve coordination with the District in review of new commercial and industrial development.

Area Wide and Mobile Sources of $PM_{10}$ Emissions

Policies and standards that result in a reduction in both the number of vehicle trips and the number of vehicle miles traveled will lead to reduced areawide and mobile $PM_{10}$ emissions. Accordingly, a policy is included that broadly encourages mixed use development, a compact development pattern in areas served by public transit, alternative modes of travel through land use, and transportation implementation measures. Transportation policies will be used to reduce or minimize the creation of "hot spots" or localized places of concentrated automobile emissions. A collection of transportation policy options is attached (*Draft Transportation Policies Related to Air Quality and Energy*).

Backyard Trash Burning

Although the air quality impacts from backyard trash burning were identified early on in the General Plan Update process as an area for possible policy development, it is not clear how additional General Plan policies or standards could further reduce air pollution from burning of back yard trash as it is presently not allowed per District requirements. Accordingly, no new policies or standards are proposed for this source of emissions.

## Alternatives

A more compact form of development encouraged by land use and transportation policies would likely result in fewer vehicle trips and shorter trips than the existing land use and transportation policies. Such policies would reduce air quality impacts from $PM_{10}$ emissions, and are included in *Alternatives A and B*.

Conversely an expanded development pattern under *Alternative C* is expected to increase both the number and length of motor vehicle trips. The resulting increase in air emissions from paved and unpaved road dust would likely adversely impact air quality more than the other alternatives.

An implementation measure to reduce $PM_{10}$ emissions by limiting the number of open fireplaces is included in *Alternative A*.

## Plan Alternatives Comparison Chart

The "Vote" column is provided for the user to indicate a policy preference. Enter a **R**etain, **D**elete or **M**odify.

**Table 19-1. Plan Alternatives Comparison Chart**

| *Plan Alternative* | | | | *Goals and Policies* | *Staff Remarks* | *Vote: R, D, M* |
|---|---|---|---|---|---|---|
| **A** | **B** | | | **AQ-P1.** Through land use and transportation policies, encourage mixed use development, a compact development pattern in areas served by public transit, and alternative modes of travel. | | |
| **A** | **B** | | | **AQ-P2.** Through transportation policies, reduce or minimize the creation of "hot spots" or localized places of concentrated automobile emissions. | | |
| **A** | **B** | | | **AQ-P3.** Minimize $PM_{10}$ emissions from new fireplace inserts and new woodstoves. | | |
| **A** | **B** | | | **AQ-P4.** Minimize $PM_{10}$ emissions from construction sites for projects involving discretionary review and new multifamily residential, commercial and industrial developments resulting in ground disturbance of one acre or more. | | |

| *Plan Alternative* | | | | *Goals and Policies* | *Staff Remarks* | *Vote: R, D, M* |
|---|---|---|---|---|---|---|
| **A** | **B** | | | **AQ-P5.** Review $PM_{10}$ emissions monitoring results from the Air Resources Board and implement new land use and transportation policies and controls to meet State and federal $PM_{10}$ emissions standards as necessary. | | |
| **A** | **B** | **C** | | **AQ-P6.** Reduce to less than significant levels emissions from new commercial and industrial development by requiring feasible, workable, monitor able and cost effective mitigation measures based on standards of the North Coast Unified Air Quality Management District during environmental review of discretionary permits. | | |
| **A** | **B** | **C** | | **AQ-P7.** Establish buffers between new commercial and industrial sources of emissions and adjacent land uses on a project-by-project basis according to the standards of the District during environmental review of discretionary permits. | | |
| **A** | **B** | **C** | | **AQ-P8.** Implement interagency governance policies to encourage coordination with the District early on in the permit review process to identify expected outcomes and minimize delays for projects involving environmental review and commercial demolition projects that may involve removal of asbestos. | | |
| **A** | | | | **AQ-P9.** Limit the number of open fireplaces in new residential construction. | | |
| | | | | *Implementation Measures* | | |
| **A** | **B** | | | **AQ-IM1.** Require new fireplace inserts and new woodstoves be certified by the Environmental Protection Agency for air quality standards through the building permit process. | | |
| **A** | **B** | | | **AQ-IM2.** Require implementation of dust suppression measures in all projects involving environmental review and new multifamily residential, commercial and industrial developments resulting in ground disturbance of one acre or more. | | |
| **A** | **B** | | | **AQ-IM3.** Review $PM_{10}$ emissions monitoring results from the Air Resources Board with future General Plan Housing Element Updates, and implement new land use and transportation policies and other regulatory controls to meet State and federal $PM_{10}$ emissions standards. | | |

| *Plan Alternative* | | | | *Implementation Measures* | *Staff Remarks* | ***Vote: R, D, M*** |
|---|---|---|---|---|---|---|
| **A** | **B** | **C** | | **AQ-IM4.** When establishing buffers between new commercial and industrial sources of emissions and adjacent land uses during environmental review of discretionary projects, use the California Air Resources Board's "Air Quality and Land Use Handbook: A Community Health Perspective", and the District's implementation guidelines. | | |
| **A** | **B** | **C** | | **AQ-IM5.** During environmental review of discretionary projects, evaluate new commercial and industrial sources of emissions using analytical methods and significance criteria approved by the District. | | |
| **A** | **B** | | | **AQ-IM6.** Expand performance standards for new Cottage Industries to prohibit emissions in amounts greater than normal for the neighborhood. | | |
| **A** | **B** | | | **AQ-IM7.** Encourage interagency coordination with the District with measures in the Governance Element. | | |
| **A** | **B** | | | **AQ-IM8.** Update the General Plan with new State standards for Greenhouse Gas emissions when they become available. | | |
| | | | **D** | **FRWK 3292(6)(A) & (B)** Standards require coordination with regulations of the California North Coast Air Basin and the Air Pollution Control Plan for the California North Coast Air Basin. | | |
| | | | **D** | **FRWK 3260** Reference to possible future limits on wood burning fire places. | | |

## Preliminary CEQA Analysis

### Summary

The County is in non-attainment status for only one air pollutant monitored by the State – $PM_{10}$ which is comprised of particulate matter, such as dust and smoke. There are numerous sources of $PM_{10}$ emissions. The most significant sources are related to vehicles; and unpaved road dust contributes as 47% of the total.

Development allowed under all the Plan alternatives is projected to lead to increases in the number of vehicle trips and vehicle miles traveled by Humboldt County residents, which in turn will result in increased $PM_{10}$ emissions. The emphasis on development in more outlying areas with *Alternative C* will likely increase $PM_{10}$ emissions from vehicle miles traveled more than with *Alternatives A and B*. Also, *Alternatives A and B* are expected to result in fewer motor vehicle trips and corresponding lower $PM_{10}$ emissions as a more compact form of development is more easily served by alternative modes of transportation, such as public transit.

*Alternative A* also includes a policy option to reduce $PM_{10}$ emissions by curtailing the number of wood burning appliances in new residential construction.

### Setting

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. In general, the climate of northern coastal California is characterized by cool summers with frequent fog and mild winters with lots of rain. In coastal areas, the ocean helps to moderate temperatures year-round. Further inland, the summers are hotter and drier and the winters colder and more snowy. At higher elevations in inland areas, it is cooler in the summers and snowier in the winter.

Winds control the rate and dispersion of local pollutant emissions. In the California North Coast Air Basin, dominant winds exhibit a seasonal pattern, especially in coastal areas. During summer months, strong north to northwesterly winds are common. During the winter months, storms from the south Pacific increase the percentage of days winds are from southerly quadrants.

Wind direction often assumes a daily pattern in the river canyons that empty into the Pacific. In the morning hours, cool air from higher elevations flows down the valleys while later in the day, as the lower elevation air heats up this pattern is reversed and the air flow heads up the canyon. These air flows are often quite strong.

Offshore and onshore flows are also common along the coast and are associated with pressure systems in the area. Onshore flows frequently bring foggy cool weather to the coast while offshore flows often blow fog away from the coast and bring sunny warm days.

In addition to wind direction, Humboldt County commonly experiences two types of inversions, radiation inversion and subsidence inversion, which affect the vertical depth of

the atmosphere through which pollutants can be mixed. Vertical air movement is important in spreading pollutants through a thicker layer of air. Horizontal movement is important in spreading pollutants over a wider area. Upward dispersion of pollutants is hindered wherever the atmosphere is stable; that is, where warm air overlies cooler air below. This situation is known as a temperature inversion. Radiation inversion occurs when the air layer near the surface of the ground cools and may extend upward several hundred feet.

Radiation inversion in Humboldt County is found in the night and early mornings almost daily, but is more prominent from late fall to early spring when there is less sunlight and it is cooler. Radiation inversion tends to last longer into the morning during the winter months than in the summer.

Subsidence inversion is caused by downward moving air aloft, which is common in the area of high pressure along and off the coast. The air warms at a rate of 5.5 degrees Fahrenheit per 1,000 feet as it descends. Thus, it arrives at a lower height warmer than the air just below and limits the vertical mixing of air. Subsidence inversion often affects a large area and is more common during the summer months. This inversion, which usually occurs from late spring through the early fall1, can be very strong and shallow given the cooling of the lower layers from the cool ocean water.

**Regulatory Context**

The State of California and the Federal government have established ambient air quality standards for a number of pollutants, which are referred to as Criteria Pollutants. These standards are categorized as primary standards, designed to safeguard public health, or as secondary standards, intended to protect crops and to mitigate such effects as visibility reduction, soiling, nuisance and other forms of damage.

Air quality is also regulated through emissions limits for individual sources of criteria air pollutants. The California Environmental Quality Act (CEQA) requires that developers and planners review applicable projects to determine their environmental impact. The District is a local resource for air quality mitigation measures in Humboldt County.

In addition to this work, the District has the following responsibilities: overseeing stationary source emissions; approving permits; maintaining emissions inventories; maintaining air quality stations; overseeing agricultural burning permits; and, reviewing air quality related sections of environmental documents required by CEQA.

The California Clean Air Act of 1988 substantially added to the authority and responsibilities of air districts. The California Clean Air Act designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California Clean Air Act focuses on attainment of the State ambient air quality standards which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards. The California Clean Air Act requires designation of attainment and non attainment areas with respect to State ambient air quality standards. The California Clean Air Act also requires that

air districts prepare an air quality attainment plan if the district violates State air quality standards for CO, sulfur dioxide, nitrogen dioxide, ozone or $PM_{10}$ standards.

The California Clean Air Act requires that the State air quality standards be met as expeditiously as practicable but, unlike the federal Clean Air Act, does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

The California Clean Air Act emphasizes the control of "indirect and area wide sources" of air pollutant emissions. The California Clean Air Act gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish transportation control measures.

The U.S. Environmental Protection Agency and the California Air Resources Board are also involved with improving air quality.

The Environmental Protection Agency's traditional responsibilities in air quality management have included establishing national ambient air quality standards, requiring that air districts develop air quality plans to meet standards imposing sanctions when plans are not met, establishing mobile source controls, and developing guideline documents for controlling air emissions.

The original federal Clean Air Act mandated the establishment of ambient air quality standards and required areas that violate these standards to prepare and implement plans to achieve the standards by certain deadlines. The deadline for attaining both the ozone and Carbon Monoxide standards was August 31, 1988. Areas that do not meet federal primary air quality standards are designated as non attainment areas. Areas that comply with federal air quality standards are designated attainment areas. Areas for which monitoring data are lacking are formally designated unclassified areas, but are generally treated as attainment areas. Attainment and non attainment areas are pollutant specific.

The federal Clean Air Act Amendments of 1990 give the EPA additional authority to require states to reduce emissions of CO, $PM_{10}$, and ozone precursors in non attainment areas. The amendments set new attainment deadlines based on the severity of the problem.

The California Air Resources Board's responsibilities have traditionally included establishing State air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving State implementation plans.

The Federal Clean Air Act requires the U.S. Environmental Protection Agency (U.S. EPA) to identify National Ambient Air Quality Standards. Currently, U.S. EPA has established national standards for the following pollutants, which together form the criteria air pollutants:

- Suspended particulate matter (PM-10 and PM-2.5); and
- Carbon monoxide (CO);

- Ozone (O3);
- Nitrogen dioxide (NO2);
- Sulfur dioxide (SO2);
- Lead (Pb).

Pursuant to the California Clean Air Act of 1988, California has adopted stricter ambient air quality standards (relative to federal standards) for the criteria air pollutants, particularly ozone and $PM_{10}$ (particulate matter, less than 10 microns in diameter). In addition, California has adopted ambient air quality standards for some pollutants for which there are no corresponding national standards.

The North Coast Air Basin consists of the counties of Humboldt, Del Norte, and Trinity. Air Quality monitoring has been conducted in the North Coast Air Basin since 1982 when the District was formed. Monitoring results have shown that the principal pollutant of the North Coast, including Humboldt County, is particulate matter.

*Particulate Matter ($PM_{10}$)*

Health concerns associated with suspended particles focus on those particles small enough to reach the lungs when inhaled. Few particles larger than 10 microns in diameter reach the lungs. Consequently, both federal and State air quality standards for particulate matter have been revised to apply only to these small particles (designated as $PM_{10}$).

State and federal $PM_{10}$ standards have been set for 24-hour and annual averaging times. The State 24-hour $PM_{10}$ standard equals 50 micrograms per cubic meter (æg/m3) and the federal 24-hour standard is 150 æg/m3. The State annual $PM_{10}$ standard is 20 æg/m3 on an annual geometric mean whereas the federal annual $PM_{10}$ standard equals 50 æg/m3 on an annual arithmetic mean. Federal and State 24-hour $PM_{10}$ standards may not be exceeded more than 1 day per year whereas both annual standards may not ever be exceeded.

According to the *Particulate Matter (*$PM_{10}$*) Attainment Plan* adopted by the District May 11, 1995, several violations of the California $PM_{10}$ ambient standard resulted in Humboldt County being classified as a $PM_{10}$ non-attainment area. In 2005, the County had an estimated 23.15 æg/m3 according to the Air Resources Board, 3.15 æg/m3 higher than allowed. The State Air Resources Board projects Humboldt County to become more out of compliance in the future. In 2020, Humboldt County is projected to have $PM_{10}$ levels of 24.9 æg/m3.

Humboldt County $PM_{10}$ emissions are generated by a variety of sources. The following table shows the estimated percent contribution by source in 2005.

**ANNUAL $PM_{10}$ EMMISSIONS**
**ESTIMATED PERCENT CONTRIBUTION BY SOURCE**
**Humboldt County, 2005**

| Source | $PM_{10}$ Percent of Total |
|---|---|
| Fugitive windblown dust | 1% |
| Off-road equipment | 1% |
| Electric utilities | 2% |
| Construction and demolition | 2% |
| Manufacturing and industrial | 2% |
| Wood and paper | 3% |
| Ships and commercial boats | 4% |
| Other sources | 4% |
| Paved road dust | 10% |
| Managed burning and disposal | 13% |
| Residential fuel combustion | 13% |
| Unpaved road dust | 47% |
| **Total** | **100%** |

Source: California Air Resources Board Almanac Emission Projection Data (2006)

The above table shows that unpaved road dust accounts for almost half of the County's $PM_{10}$ emissions (47%), and paved road dust accounts for another 10%.

Road dust emissions are estimated for city and county roads, U.S. forests and park roads, and BLM/BIA roads (Bureau of Land Management and Bureau of Indian Affairs). The total miles of unpaved roads in each of the categories listed is derived from the Caltrans document, "Assembly of Statistical Reports, 1993". And based on previous informal surveys, it is assumed that each mile of unpaved road receives ten vehicle passes per day. This, combined with the road miles, is used to compute the county specific vehicle miles traveled (VMT) on unpaved roads.

Daily activity on unpaved roads occurs primarily during daylight hours. Activity is assumed to be the same each day of the week. The monthly activity profile is increased during the Spring and Summer months to account for additional recreational travel and drier, dustier roads. On-road VMT is used for the growth parameter in projections of $PM_{10}$ emissions in future years.

The Attainment Plan identified several ways to reduce $PM_{10}$ emissions that are reflected in the policy options presented in this Element:

- land use controls to encourage pedestrian and transit oriented development, walkable communities, and integration of land use and transportation;
- transportation measures to encourage public transit, rideshare programs, park and ride lots, and bike routes; and,
- controls on residential open waste burning, conventional fireplace replacements, improved woodstoves, new development requirements, woodstove curtailments on high smoke days, education and home weatherization.

General Plan policies that achieve reductions in vehicle miles traveled, particularly on unpaved roads could potentially reduce those air quality impacts consistent with the Attainment Plan. Policies restricting wood burning appliance use may also help reduce $PM_{10}$ emissions as 13% of the County total comes from residential fuel combustion.

*Toxic Air Contaminants*

Regulation of toxic air contaminants is achieved through federal and state controls on individual sources. Toxic air contaminants are air pollutants with short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects, for which no ambient air quality standards have been established. The 1990 Federal Clean Air Act Amendments offer a comprehensive plan for achieving significant reductions in both mobile and stationary source emissions of certain designated toxic air contaminants.

The District conducts and updates risk assessment for all major point sources on the North Coast every four years. All sources within the District that have been reviewed for health risks are reported to fall below the ten in a million risk level. This means that less than ten individuals in a million are at risk of contracting cancer due to the emissions from the sources reviewed.

Additionally, the District administers the Air Toxics Hot Spot program. This program identifies the types and kinds of chemicals that are released by certain facilities creating an emissions inventory. Next, the inventories are evaluated and ranked according to health risk potential. Those facilities with the highest risk potential must prepare formal risk assessments.

Regulation of toxic air contaminants from mobile sources has traditionally been implemented through emissions standards for on-road motor vehicles and through specifications for gasoline and diesel fuel sold in California, rather than through land use decisions, air quality permits or regulations addressing how the general public uses motor vehicles. In 1998, Diesel exhaust particulate matter from internal combustion engines was designated a toxic air contaminant for cancer. Now land use decisions must include mitigation efforts for heavy duty diesel equipment operated during construction phases.

During 1991, the California Air Resource Board used a mobile monitoring station to conduct risk assessment on ambient air measurements in Eureka and Arcata. Air samples

were collected at various locations around Humboldt Bay by the mobile monitoring station and then analyzed for various toxic substances. The study included the risks from all air toxics and not just those emitted from industrial sources. This study showed that the average cancer 2 Federal environmental laws refer to "hazardous air pollutants" and California environmental laws refer to "toxic air contaminants." The two terms generally encompass the same constituent toxic compounds.

Risk from airborne toxics in the Humboldt Bay area was 86 in a million. As shown in Table 9-1, this is substantially lower than the average risk in other California cities.

**Health Risk Associated with Air Quality in Humboldt and Other California Cities**

| *City/Location* | *Risk (x1,000,000)* |
|---|---|
| Humboldt Bay | 86 |
| Azusa | 459 |
| San Francisco | 524 |
| Bakersfield | 569 |
| San Jose | 780 |
| Los Angeles | 888 |
| Burbank | 1,231 |

*Source: North Coast Air Quality Facts, North Coast Unified Air Quality Management District, 1991*

## Potential Impacts, Mitigations & Findings

Criteria For Determining Significance

According to the State CEQA Guidelines (Section 15064[e] and Appendix G), a project will normally have a significant adverse impact if it would.

- *Violate any ambient air quality standard;*
- *Contribute substantially to an existing or projected air quality violation;*
- *Expose sensitive receptors to substantial pollutant concentrations; and,*
- *Result in inconsistency with air quality plans designed to bring an area into attainment with the federal or State ambient standards.*

IMPACT AQ-1 The project may conflict with or obstruct implementation of the applicable air quality plan.

IMPACT AQ-2 The project may violate an air quality standard or contribute substantially to an existing or projected air quality violation.

IMPACT AQ-3 The project may result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment.

Since the all Plan alternatives encourage residential development, they will likely indirectly lead to more persons driving in the County, and hence more $PM_{10}$ emissions. This is inconsistent with the Air Quality Management Plan, which seeks to reduce $PM_{10}$ emissions. Since the County is in a non-attainment status with regard to $PM_{10}$ emissions, the alternatives may all indirectly contribute to the continued violation of State air quality standards.

Mitigation Measures

Policies, programs, standards and other requirements described above reduce the impacts of the project, but not to levels of insignificance.

Finding

Impacts AQ-1 (Conflict with Air Quality Plan), AQ-2 (Violate and Air Quality Standard) and AQ-3 (Cumulative Increase of Pollutant) are considered significant and unavoidable.

IMPACT AQ-4 The project may expose sensitive receptors to substantial pollutant concentrations.

New commercial and industrial development such as asphalt batch plants often generate significant amounts of dust and other air quality impacts. Persons living adjacent to such industrial uses who are sensitive to pollution could be adversely impacted by the air quality impacts. Public notification of public hearings considering such projects and buffering requirements for neighboring residential uses provide a forum where project specific measures can be implemented to minimize air quality impacts on sensitive receptors.

Mitigation Measures

Public notification of hearings to consider projects that may generate air quality impacts and buffering of neighboring residential uses can be important to limit new commercial and industrial uses such that they do not significantly affect sensitive receptors.

Finding

Those new policies, programs, and standards described above reduce Impact AQ-4 (Sensitive Receptors) to a level of insignificance.

**Conclusion**

Development allowed under all the Plan alternatives is projected to lead to increases in the number of vehicle trips and vehicle miles traveled by Humboldt County residents, which in turn will result in increased $PM_{10}$ emissions. The emphasis on development in more outlying areas with *Alternative C* will likely increase $PM_{10}$ emissions from vehicle miles traveled more than with *Alternatives A and B*. Also, *Alternatives A and B* are expected to result in fewer motor vehicle trips and corresponding lower $PM_{10}$ emissions as a more compact form of development is more easily served by alternative modes of transportation, such as public transit.

**Glossary and Definitions**

Ambient Air Quality Standards: Health- and welfare-based standards for outdoor air which identify the maximum acceptable average concentrations of air pollutants during a specified period of time.

Area Wide Sources: An area-wide source is defined as any source that emits less than 10 tons per year of a single hazardous air pollutant (HAP) or 25 tons per year of all HAPs.

Criteria Air Pollutant: An air pollutant for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. Examples include: ozone; carbon monoxide; nitrogen dioxide; sulfur dioxide; $PM_{10}$, and $PM_{2.5}$.

GHG's Greenhouse Gases. Carbon dioxide and other gases that trap heat radiating from the Earth's surface much like a greenhouse's windows trap heat from radiating sunlight.

Mobile Sources: Sources of air pollution such as automobiles, motorcycles, trucks, off-road vehicles, boats, and airplanes (compare with Stationary Sources).

North Coast Unified Air Quality Management District, the district that includes Humboldt County.

Ozone: A pollutant resulting from the reaction between sunlight and smog.

$PM_{10}$: Particulate Matter less than 10 microns in diameter. A pollutant caused by airborne particles that are ten microns in diameter and smaller.

Stationary Sources: Non-mobile sources such as power plants, refineries, and manufacturing facilities which emit air pollutants (compare with Mobile Sources).

Vehicle Miles Traveled (VMT): The miles traveled by motor vehicles over a specified length of time (e.g., daily, monthly, or yearly) or over a specified road or transportation corridor.