

Tribal Air Quality Assessment 1.0



Prepared by:

**Confederated Tribes of
Coos, Lower Umpqua, & Siuslaw Indians
Department of Natural Resources**

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Definitions

Air - “pure” air is a mixture of gases containing about 78 percent nitrogen; 21 percent oxygen; less than 1 percent of carbon dioxide, argon, and other inert gases; and varying amounts of water vapor.

Air monitoring- sampling for, and measuring of, pollutants present in the atmosphere.

Air basins - area defined by geographical and administrative boundaries; used for air pollution control programs.

Airshed - geographical area that, because of topography, meteorology, and climate shares the same air.

Air quality standard – the prescribed level of a pollutant in the outside (ambient) air that should not be exceeded during a specific time period, to protect public health. Established by both federal, state, and tribal governments.

Ambient air- outside air; any portion of the atmosphere not confined by walls and a roof.

Ancestral Territory- homelands of the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians.

Anthropogenic- produced or resulting from human activities.

Carbon Dioxide (CO₂)- a colorless, odorless, non-poisonous gas that results from fossil fuel combustion and is a normal constituent of ambient air at low concentrations. Carbon dioxide is required for the process of photosynthesis in plants.

Carbon Monoxide (CO)- a colorless, odorless, toxic gas produced by the incomplete combustion of fossil fuels. One of the criteria air pollutants, it is emitted in large quantities by exhaust from gasoline-powered engines.

Clean Air Act (CAA)- long standing federal legislation that is the legal basis for national clean air programs; first passed in 1970, last amended in 1990 (referred to as the CAAA, or Clean Air Act Amendments).

Combustion- burning, that is, the production of heat and light energy through chemical change, such as oxidation of hydrocarbon fuels.

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI)- one of nine federally recognized Indian Tribe located in Oregon.

Criteria air pollutants- as required by the Clean Air Act, the EPA identifies and set standards to protect human health and welfare for six pollutants: ozone (O₃), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), lead (Pb), and nitrogen oxides (NO_x). The term “criteria pollutants” derives from the requirement that the EPA must describe the characteristics and potential health and welfare effects of these pollutants. EPA periodically reviews new scientific data and may propose revisions to the standards as a result.

Department of Natural Resources (DNR)- the department within the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians Tribal Government responsible for the management of natural and cultural resources.

Emissions- the release of pollutants into the air from a source.

Emissions Inventory (EI)- a detailed list of air pollutants emitted into an area's atmosphere in amounts (commonly tons) per day or year, by type of source. Information from a Source Identification is compiled into a comprehensive report of sources, activities and pollutants.

United States Environmental Protection Agency (EPA)- federal agency responsible for the protection of the nation's human health and environment.

Federal Implementation Plan (FIP)- a federally (EPA) implemented plan to achieve attainment of air quality standards; used when a state or tribe is unable to develop an adequate plan.

Fossil Fuels- coal, oil, and natural gas; so-called because they are the remains of ancient plants and animal life.

Hazardous Air Pollutants (HAP's)- pollutants not regulated by the National Ambient Air Quality Standards but which may contribute to irreversible illness and death; also known as toxic air pollution or Air Toxics, EPA has documented a list of 188 that are addressed in Title III of the CAA. Examples include: asbestos, benzene, beryllium, mercury, radionuclides, and vinyl chloride.

Inversion- the phenomenon where a layer of warm air "presses down" on and "traps" cooler air below it (air temperature increases with altitude). Inversions prevent the natural dispersion and dilution of air contaminants. Inversions are characteristic of geographic areas such as basins, valleys & canyons.

Lane Regional Air Protection Agency (LRAPA)- Local agency responsible for air quality management activities in Lane County.

Minor source- A stationary source that emits or has the potential to emit less than the relevant major source amount of any pollutant regulated under the federal Clean Air Act.

National Ambient Air Quality Standards (NAAQS)- pollutant concentration limits established by EPA to protect human health and welfare that apply to ambient (outside) air.

National Emissions Inventory (NEI)- a national database of air emissions information from numerous state and local air agencies, tribes, and industry that contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAP's).

Nitrogen Dioxide (NO₂)- a highly toxic gas that can be damaging to lung tissue and is a precursor to nitric acid formation (leads to acid deposition) and major precursor to the formation of smog (ground-level ozone). Has a reddish-brown color and strong odor, but is not flammable.

Nitrogen Oxides (NO_x)- gases formed in great part from atmospheric nitrogen and oxygen when combustion takes place under conditions of high temperature and high pressure; considered a major air pollutant (one of the criteria pollutants) and a precursor of ozone.

Non-Attainment Area (NAA)- defined geographic area that exceeds one or more of the national ambient air quality standards (NAAQS) for the criteria pollutants based on a calculation of hourly and/or annual average concentrations.

Open Burning- the uncontrolled burning of waste materials in the open, in outdoor incinerators, or in an open dump, either intentionally or accidentally.

Ozone (O₃)- a pungent, colorless, toxic gas. Close to the earth's surface it is produced photochemically from hydrocarbons, oxides of nitrogen and sunlight and is a major component of smog (tropospheric ozone). At very high altitudes (10-30 miles) above the earth's surface, it protects the earth from harmful ultraviolet (UV) radiation (stratospheric ozone). Ozone is the only criteria pollutant that is not emitted from a source, but is formed from other pollutants (E.g. VOC's and NO_x).

Oregon Department of Environmental Quality (DEQ)- state regulatory agency whose job is to protect the quality of Oregon's Environment.

PM_{2.5}- (Particulate Matter less than 2.5 micrometers in diameter)- tiny solid or liquid particles, generally soot and aerosols also known as PM "fine." The size of the particles (2.5 micrometers or smaller, about 0.0001 inches) allows them to easily enter the alveoli (air sacs deep in the lungs) where they can cause adverse health effects. PM_{2.5} particles are not easily dislodged from the human body and may even enter into the bloodstream. PM_{2.5} also causes visibility reduction.

PM₁₀- (Particulate Matter less than 10 micrometers in diameter)- tiny solid or liquid particles of soot, dust, smoke, and aerosols also known as PM "coarse." The size of the particles (10 micrometers or smaller, about 0.0004 inches) allows them to easily enter the passageways of the lungs where they may be deposited, resulting in adverse health effects. PM₁₀ particles are responsible for aggravating a variety of respiratory disorders (asthma, bronchitis, etc.), but can be dislodged from the human body by coughing, etc. PM₁₀ also causes visibility reduction.

Point source- a source of pollution that is well-defined, such as a smokestack or vent in a large industrial facility.

Regional Haze- a cloud of aerosols extending across a large region and causing noticeably hazy conditions.

Smog- a term used to describe many air pollution problems. The word smog is a contraction of the words "smoke" and "fog;" often it describes the irritating stagnant haze, much of which is usually ground-level (tropospheric) ozone that results from the sun's effect on pollutants in the air.

Title I- a section of the 1990 amendments to the federal Clean Air Act that deals with stationary sources, attainment, non-attainment and Prevention of Significant Deterioration.

Title II- a section of the 1990 amendments to the federal Clean Air Act that deals with mobile sources.

Title III- a section of the 1990 amendments to the federal Clean Air Act that deals with the control of Hazardous Air Pollutants (HAP's).

Title IV- a section of the 1990 amendments to the federal Clean Air Act that deals with acid deposition.

Title V- a section of the 1990 amendments to the federal Clean Air Act that deals with operating permits for major sources of air pollution.

Title VI- a section of the 1990 amendment to the federal Clean Air Act that deals with stratospheric ozone protection.

Treatment as a State (TAS)- (also known as “eligibility determination” or “treatment in a manner similar to States”) Because the Clean Air Act, like many other environmental statutes, is specifically designed for state implementation, before EPA can approve a tribal CAA program a Tribe must first be determined eligible by EPA to be treated as a state for that program. The process is outlined in the TAR: to be determined eligible, tribes must demonstrate (1) federal recognition, (2) an adequate governing body, (3) jurisdictional authority, and (4) capability to effectively administer the CAA program for which the tribe is seeking approval.

Tribal Authority Rule (TAR)- 40 CFR 49, Subpart A of the CAAA of 1990. The TAR provides tribes with the authority to implement the CAA and instructs the EPA to promulgate regulations specifying the CAA provisions for which it is appropriate to treat tribes as states. The TAR also provides for flexibility in tribal air program development, a reduced match requirement for air program grants and federal implementation as necessary and appropriate to protect tribal air quality. The TAR was promulgated on February 12, 1998 and was upheld by the U.S. Supreme Court in April 2001.

Tribal Implementation Plan (TIP)- an EPA-approved tribal plan for attaining and maintaining national ambient air quality standards.

Volatile Organic Compounds (VOC's)- organic compounds that evaporate readily at typical atmospheric temperatures. VOC's are a major precursor of ground-level ozone formations.

1.1 Purpose of an Air Quality Assessment

The Tribes are developing a Tribal Air Management Program in an effort to assume air quality protection programs mandated under the federal Clean Air Act's Tribal Authority Rule. The purpose of the following Air Quality Assessment (AQA) is to provide a broad assessment on air quality conditions within the tribal resource area of interest in an effort to determine whether air quality risks from criteria pollutants and/or air toxics exists that could have adverse affects on community health and the environment. Extensive research has been completed on the various types, sources, and impacts of air pollution. Research has also been focused on past and present air quality monitoring and regulation activities conducted by the Environmental Protection Agency, Oregon Department of Environmental Quality and Lane Regional Air Protection Agency.

1.2 Background

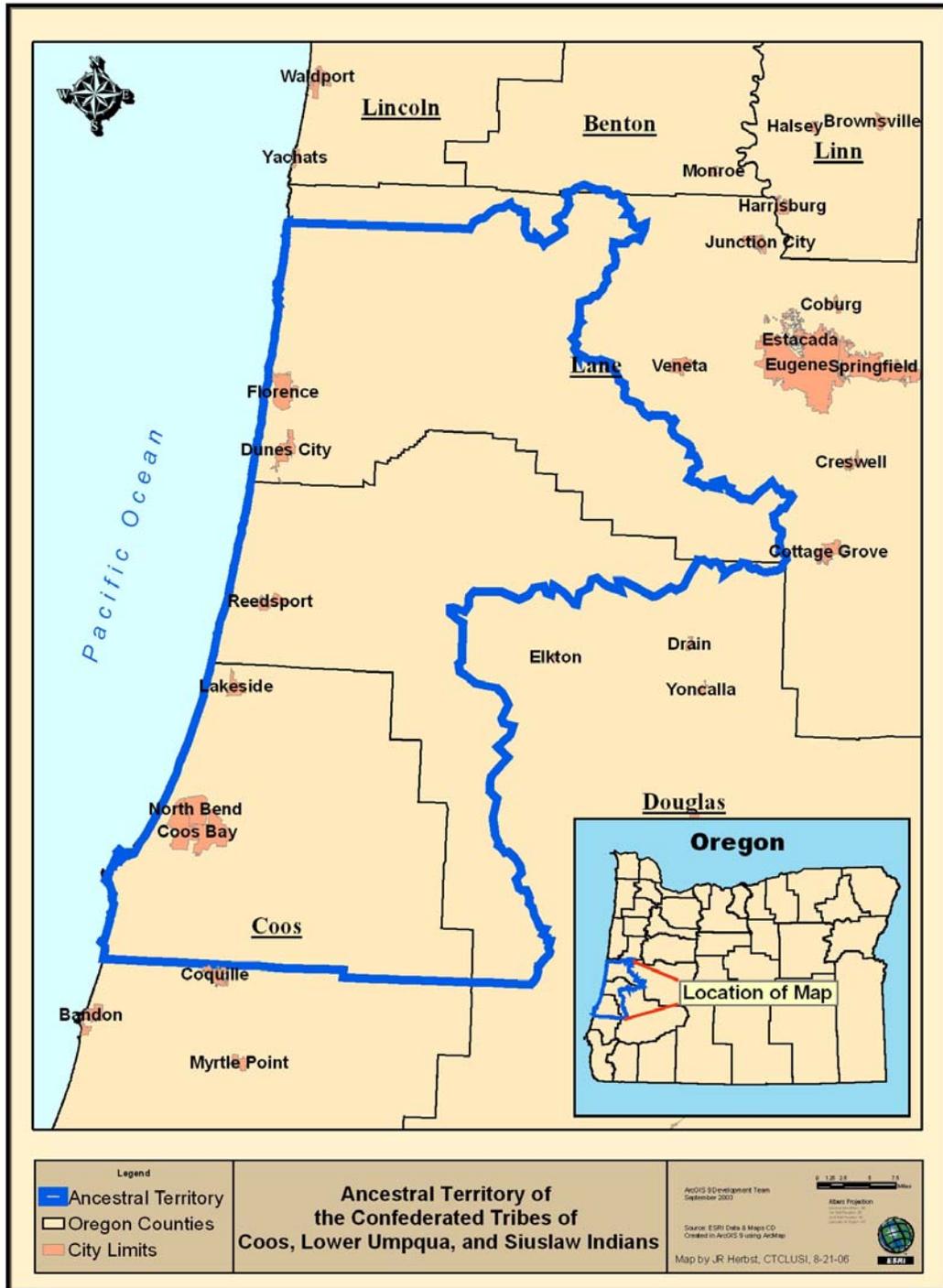
Since time immemorial, the Coos, Lower Umpqua, and Siuslaw people lived along the Coos, Umpqua, and Siuslaw estuaries and tributaries (**see Figure 1**). These homelands offered an abundance of resources that fostered the development of unique tribal cultures. Sharing these resources, cultural similarities, and intermarriage patterns, the Coos, Lower Umpqua, and Siuslaw Indians formed a distinct group of Tribes. The United States government accepted the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians as a single political unit in 1855 when it negotiated a treaty with the "chiefs, headmen, and delegates of several bands of the Coos, Lower Umpqua and Siuslaw Tribes of Indians." These three Tribes officially united as the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians in 1917.

In 1954, the U.S. Congress passed legislation terminating many tribes in western Oregon including the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians. For the years after termination, the Tribes struggled to maintain a tribal identity and organization while at the same time fight to regain federal recognition. The fight for federal recognition ended on October 17, 1984, when the Tribes were once again federally recognized through the enactment of the Coos, Lower Umpqua, and Siuslaw Restoration Act (Public Law 98-481).

Since restoration, the Tribes have continued to maintain a strong tribal government, develop/expand tribal programs, exercise tribal sovereignty, increase the tribal land base, and pursue economic opportunities. To assist with a growing land base and ongoing tribal natural/cultural resource management needs, the Tribal Council established the Department of Natural Resources (DNR). The initial focus of the DNR was to develop basic government-to-government relationships, secure grant funding, and increase technical environmental management capacity. EPA has provided grant funding under the Indian General Assistance Program and Clean Water Act that has allowed the Tribes to develop and sustain environmental protection programs. Initially these EPA grants focused on developing environmental programs that assess and protect tribal waters, but

as environmental management capacity increased so has the ability for the Tribes to develop tribal land and air protection programs.

Figure 1. Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians Ancestral Territory



Tribal Resource Area of Interest

The ancestral homelands of the Coos, Lower Umpqua, and Siuslaw Indians totals approximately 1.6 million acres located in southwestern Oregon. After the Tribes were federally restored in 1984, the Tribes held less than 8 acres of reservation lands. Today tribal lands have grown to approximately 390 acres (**See Appendix A**). A majority of these tribal lands held in trust by the Bureau of Indian Affairs and are located within and near the cities of Coos Bay and Florence, Oregon.

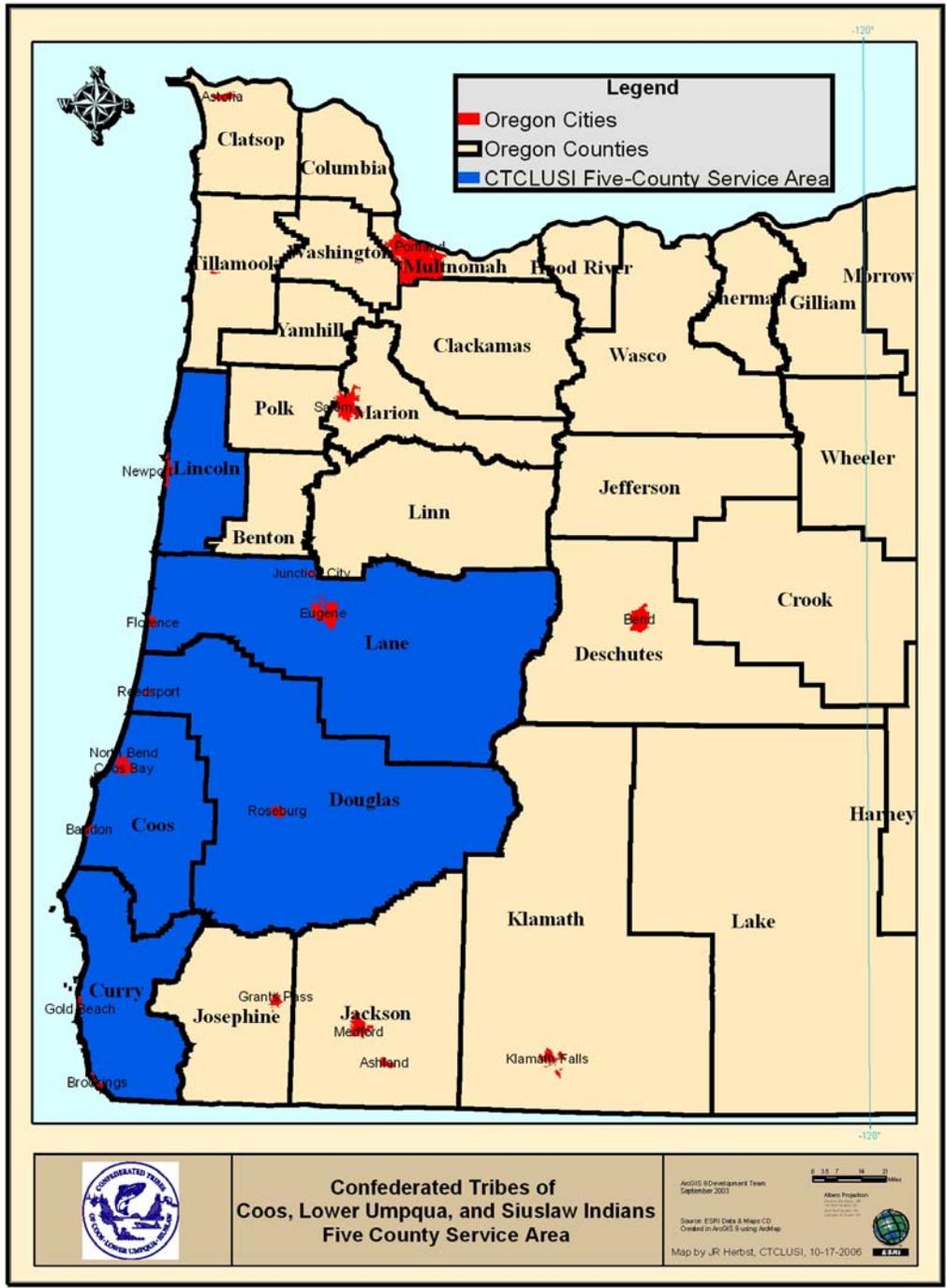
The tribal natural and cultural resource area of interest for the Tribes expands beyond present day held tribal lands. The Tribe's resource area of interest encompasses the ancestral homelands of the Tribes. The Tribes work daily with stakeholders to improve and protect natural and cultural resources within these homelands and extend this effort to include air quality management.

The Oregon Department of Environmental Quality (ODEQ) conducts air quality management on a county based approach for all Oregon Counties except for Lane County. The ODEQ has delegated air quality management to the Lane Regional Air Protection Agency (LRAPA, www.lrapa.org). Tribal staff have researched and reviewed EPA, DEQ, and LRAPA air quality permits, emissions inventories/summaries, and monitoring efforts within the Tribe's Five-County Service Area. These counties include Curry, Coos, Douglas, Lane, and Lincoln located in southwestern Oregon (**See Figure 2**).

Federal Air Rules for Reservations (FARR)

The Environmental Protection Agency (EPA) enacted the Federal Air Rules for Reservations (FARR) on June 7, 2005 (<http://www.epa.gov/r10earth/farr.htm>) for all Tribes within EPA's Region 10. The FARR is an effort by EPA to establish a Federal Implementation Plan (FIP) that provides Tribes within Region 10 with federally enforceable air quality federal regulations for tribal reservation lands. The FARR allows Tribes the opportunity to develop a Tribal Implementation Plan (TIP) and assume air management on tribal lands. The FARR is limited in jurisdictional scope and only applies to tribal lands located within a congressionally designated reservation boundary. Many Tribal Governments in Region 10, especially federally restored Tribes, have tribal trust lands located outside of a congressionally established reservation boundary. This poses a unique challenge to Tribes and EPA within Region 10 to establish air quality rules that protect these "off-reservation" tribal lands.

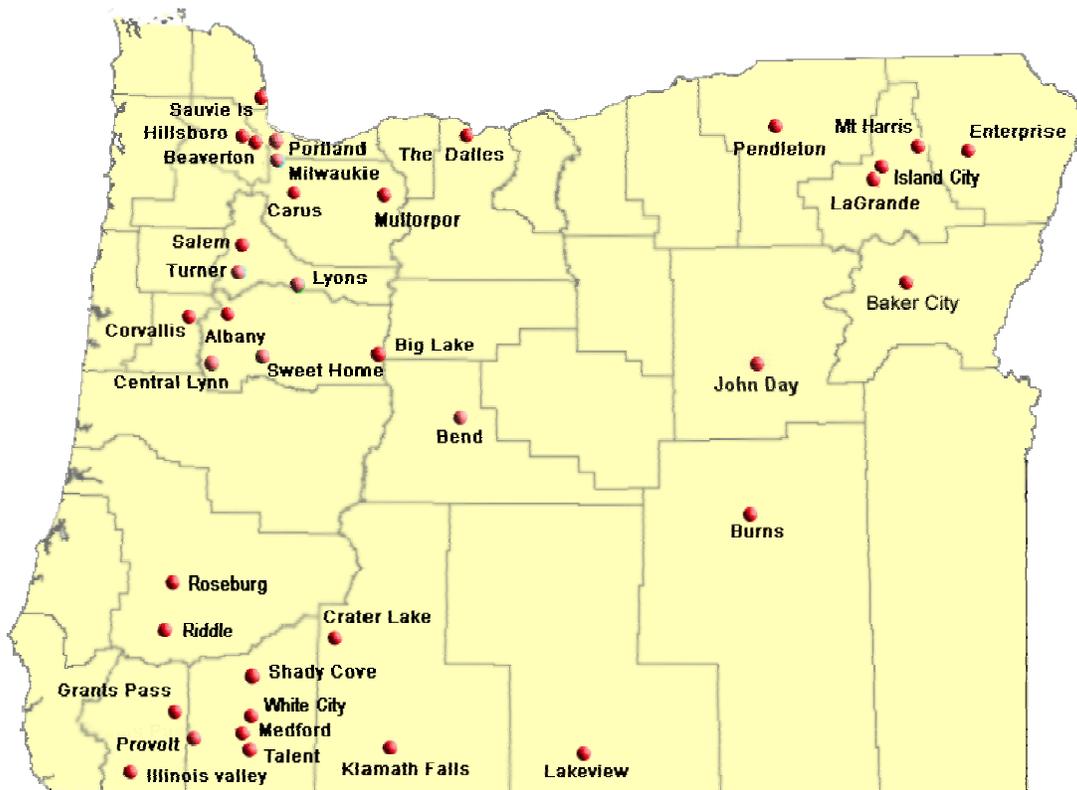
Figure 2. Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians Five County Service Area (established by Public Law 98-481)



1.3 Tribal Air Quality Concerns

The lack of ambient air quality monitoring being conducted on the Oregon Coast is a tribal concern. As seen in **Figure 3**, the ODEQ do not have any ambient air quality monitoring stations sited on the Oregon Coast. The majority of ODEQ's air quality monitoring stations are located within the interior valleys of the Coast and Cascade Mountain Ranges where the majority of Oregon's 3.6 million people reside. An explanation for this is that the ODEQ air quality program works off a limited air quality monitoring budget and needs to focus statewide air quality monitoring efforts on urban areas with concentrated air pollution sources. For Lane County, LRAPA focuses its ambient air quality monitoring efforts within the inland valleys east of the Coast Mountain Range. In addition, these interior valleys are also susceptible to extended meteorological inversions events that can trap harmful air pollution near the surface.

Figure 3. Oregon DEQ Air Monitoring Station Map



(Source: <http://www.deq.state.or.us/lab/aqm/air%20monitoring%20stations%20list.htm>)

The lack of ambient air quality monitoring on the Oregon Coast makes it difficult to assess baseline air quality conditions. Proposed industrial development within the Tribe's resource area of interest could potentially increase air pollution sources. The Tribes are concerned that without a credible baseline air quality assessment of current conditions it will be difficult to document future air degradation associated with industrial development.

Indoor air quality is a tribal air quality concern. The Pacific Northwest climate provides a great opportunity for indoor mold growth. The tribal air management program will include an indoor air quality program to address indoor air quality issues and protect and educate tribal members against indoor air pollution.

1.3 Airshed Description

Airsheds

The majority of the tribal lands are located within the Oregon Coast Airshed. The Oregon Coast Airshed is generally well mixed year around due to the influence of the Pacific Ocean. Low pressure systems move through the airshed throughout the year and usually bring wind, clouds, and rain. The intensity and frequency of these low pressure systems increases during the fall and winter resulting in very rainy and windy conditions. In between these low pressure systems high pressure systems move in resulting in drying trends. High pressure systems generally dominant the airshed during late spring, summer, and early fall. Coastal fog due to inland heating is common during the summer months. In general, the Oregon Coast Airshed remains relatively unstable resulting in a well mixed airshed and good air quality.

The Tribes do have one land holding in Springfield, Oregon that is used for tribal housing. The holding is located within the Willamette Valley Airshed within the city of Springfield, Oregon. Many of the inland areas of Lane County can experience periods of air stagnation. When this happens during the winter months, cold air often becomes trapped near the valley floor with slightly warmer air aloft, creating temperature inversion conditions. The combination of cold, stagnant air and restricted ventilation causes air pollutants to become trapped near the ground. Wintertime inversions contribute to high particulate levels, while summertime inversions contribute to increases in ozone levels, both causing the local air quality to deteriorate. (Source: www.lrapa.org)

Climate and Topography

The following information on the Oregon Coast and Willamette Valley climates was located on the Oregon Climate Service (OCS) website which is affiliated with Oregon State University's College of Oceanic and Atmospheric Sciences (COAS). (Source: <http://www.ocs.oregonstate.edu/index.html>)

Oregon Coast

Stretching along Oregon's Pacific border, the coastal zone is characterized by wet winters, relatively dry summers, and mild temperatures throughout the year. Coastal terrain features include a coastal plain (extending from less than a mile to a few tens of miles in width), numerous coastal valleys, and the Coast Range, whose peaks range from 2,000 to 5,500 feet above sea level and extend down the full length of the state. Rivers such as the Coquille, Umpqua, and Yaquina dissect the Coast Range and drain its slopes.

The area's heavy precipitation results from moist air masses moving off the Pacific Ocean onto land, especially during winter months. The abundant moisture supports lush pastures for dairy and animal production as well as valley crops of grass seed, flower bulbs, nuts, and fruit.

Along the lower elevations of the immediate coast, normal annual precipitation is between 65 to 90 inches. However, spots high on the west slopes of the range may get up to 200 inches. Several days of abundant rainfall can cause strong flood events. In some locations, flood control dams have greatly reduced the incidence of damaging floods. As is typical of western Oregon, the highest monthly precipitation values for the coast occur in the winter months of November, December, and January.

The months of July, August, and September tend to be the warmest, but average summer temperatures are only about 15 degrees above the coldest month, January. Average heating and cooling degree days (base 65 deg F) are lower for the coastal region than any other Oregon region as a result of the mild temperatures.

Extremely high or low temperatures are rare, and the annual temperature range is lower than any other Oregon climate zone. Temperatures of 90 deg F or above occur, on the average, less than once per year, and freezing temperatures are infrequent. Newport, for example, records temperatures of 32 deg F or below an average of 30 times per year. Killing frosts are even less frequent. Most of the area averages more than 300 days between the last occurrence (in spring) and the first occurrence (in fall) of 28 deg F temperatures.

Occasional strong winds strike the Oregon Coast, usually in advance of winter storms. Wind speeds can exceed hurricane force, and in rare cases have caused significant damage to structures or vegetation. Damage is most likely at exposed coastal locations, but it may extend into inland valleys as well. Such events are typically short-lived, lasting less than one day.

Skies are likely to be cloudy during winter, and only partly cloudy during summer. At Astoria, average winter cloud cover is over 80 percent, dropping only to about 65 percent in summer. Summer cloud cover is due mostly to fog and low clouds. As a result of the persistent cloudiness, total solar radiation is lower here than in any other part of the state.

Willamette Valley

The Willamette Valley is the most diverse agricultural area in the state of Oregon, and also the home of the majority of the population. Oregon's three largest cities, Portland, Salem, and Eugene, are located in the north, central, and south portions of the Valley, respectively. The urban areas are surrounded by varied and productive ranches, orchards, and farms. Among the crops grown in significant quantities are tree fruits, nuts, berries, mint, grains, and hay. Livestock operations are also common, including the dairy and poultry industries.

The climate of the Valley is relatively mild throughout the year, characterized by cool, wet winters and warm, dry summers. The climatic conditions closely resemble the Mediterranean climates, which occur in California, although Oregon's winters are somewhat wetter and cooler. Growing seasons in the Willamette Valley are long, and moisture is abundant during most of the year (although summer irrigation is common).

Like the remainder of western Oregon, the Valley has a predominant winter rainfall climate. Typical distribution of precipitation includes about 50 percent of the annual total from December through February, lesser amounts in the spring and fall, and very little during summer. Rainfall tends to vary inversely with temperatures -- the cooler months are the wettest, the warm summer months the driest.

There is considerable variation in precipitation in the Valley, ranging from annual totals below 40 inches in the Portland area to upwards of 80 inches in the Cascade and Coast Range foothills. Elevation is the single most important determinant of precipitation totals. Even in the lower sections of the Valley the effects of elevation are pronounced. Portland, for example, at 21 feet above sea level, receives an average of 37.4 inches (30-year normal), while Salem (196 feet) receives 40.4 inches and Eugene (359 feet) receives 46.0 inches. Thus, a change of only 338 feet of elevation produces an increase of 23 percent above Portland's total.

Extreme temperatures in the Valley are rare. Days with maximum temperature above 90 deg F occur only 5-15 times per year on average, and below zero temperatures occur only about once every 25 years. Mean high temperatures range from the low 80's in the summer to about 40 deg F in the coldest months, while average lows are generally in the low 50's in summer and low 30's in winter. The mean growing season (days between 32 deg F temperatures) is 150-180 days in the lower portions of the Valley, and 110-130 days in the foothills (above about 800 feet).

Although snow falls nearly every year, amounts are generally quite low. Valley floor locations average 5-10 inches per year, mostly during December through February, although higher totals are observed at greater elevations in the foothills.

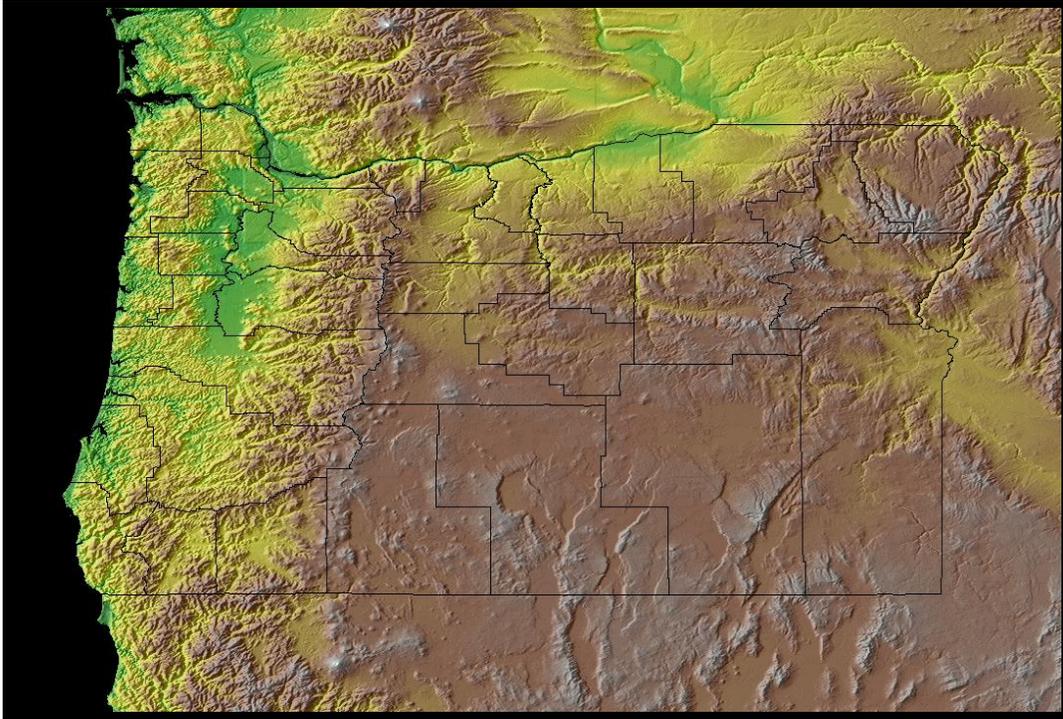
Severe storms are rare in the Valley. Ice storms occasionally occur in the northern portions of the Valley, resulting from cold air flowing westward through the Columbia Gorge. High winds occur several times per year in association with major weather systems.

Relative humidity is highest during early morning hours, and is generally 80-100 percent throughout the year. Humidity is generally lowest during the afternoon, ranging from 70-80 percent during January to 30-50 percent during summer. Annual pan evaporation is about 35 inches, mostly occurring during the period April - October.

Winters are likely to be cloudy. Average cloud cover during the coldest months exceeds 80 percent, with an average of about 26 cloudy days in January (in addition to 3 partly cloudy and 2 clear days). During summer, however, sunshine is much more abundant,

with average cloud cover less than 40 percent; more than half of the days in July are clear.

Topography of Oregon



(Source: <http://www.ngdc.noaa.gov/cgi-bin/seg/topo/state2.pl>)

Demographics

County populations for the Tribe's Five-County Service Area-
(Source: www.census.gov, 2000 US Census Data)

Curry	22,100
Coos	62,779
Douglas	100,399
Lane	322,959
Lincoln	44,479

American Indian and Alaska Native (AIAN) population for each Oregon County-
(Source: www.census.gov, 2000 US Census Data)

Curry	464 (2.1%)
Coos	1,507 (2.4%)
Douglas	1,506 (1.5%)
Lane	3,553 (1.1%)
Lincoln	1,379 (3.1%)
AIAN % of Oregon's total population= 1.3%	

Tribal Membership

As of June 2006, there are 817 enrolled tribal members. Approximately half of the tribal membership lives within the Tribe's five-county service area. The Tribes own and manage a housing development called Qaxas Heights located in North Bend, Oregon. Qaxas Heights provides affordable tribal housing to many tribal families. Additional tribal housing developments are planned and will be built as resources become available.

Figure 5. Qaxas Heights Tribal Housing



1.4 Air Pollution Sources

No point source emissions are located on tribal lands. Based on a recently conducted source inventory, potential air pollution sources on tribal lands include fossil fuel combustion, controlled open burning, construction/maintenance activities, and particulates generated from paved and unpaved roads. Open burning activities are limited duration events and include material from land clearing and maintenance activities.

The following Title V facility search was produced using the Tribe's Geographic Information System (GIS) capacity. Map queries were completed to identify current Title V sources within the Ancestral Territory and then any Title V source within a 50 mile

buffer of the Ancestral Territory. As stated before only one Title V source is located within the Tribes Ancestral Territory.

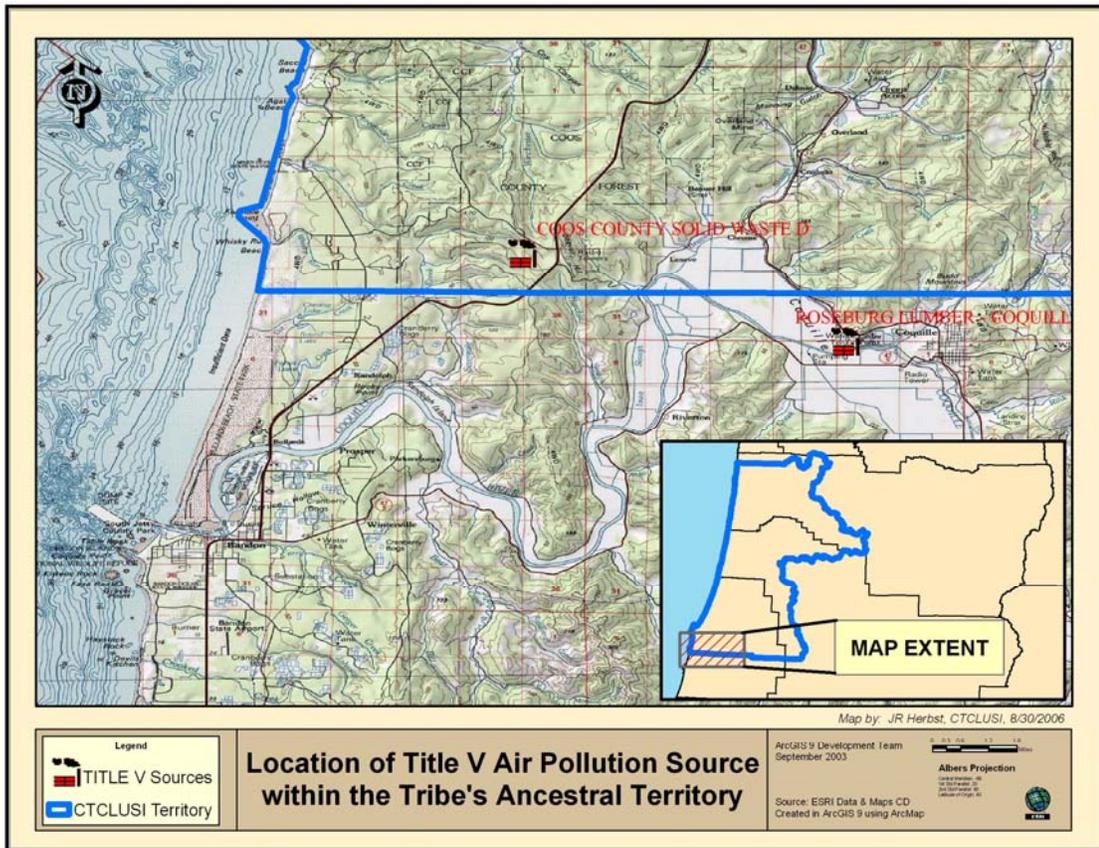
ODEQ and LRAPA Regulated Title V Source within the Ancestral Territory

Only one ODEQ Title V regulated point source is in operation within the Tribe’s resource area of interest (See Figure 7). Additional tribal air quality concerns are management of open burns on and off tribal lands.

Coos County

1. Coos County Solid Waste Department’s Beaver Hill Incinerator and Disposal, Coquille, Oregon

Figure 6. Map of Coos County Title V Sources



DEQ and LRAPA Regulated Title V Sources within a 50-Mile Buffer of the Ancestral Territory

A total of 47 CAA Regulated Title V sources are located within a 50-Mile buffer of the Ancestral Territory.

Coos County

1. Roseburg Lumber Company's Plywood #6 Plant, Coquille, Oregon
(Source: <http://www.deq.state.or.us/aq>)

Douglas County

1. Emerald Forest Products, Inc., Drain, Oregon
2. Murphy Plywood Company, Sutherlin, Oregon
3. FCC Commercial Furniture, Roseburg, Oregon
4. Brunswick Family Boat Co., Roseburg, Oregon
5. Sun Studs, Inc., Roseburg, Oregon
6. Cogen II, Riddle, Oregon
7. Roseburg Forest Products, Riddle, Oregon
8. Superior Veneer Co., Glendale, Oregon
(Source: <http://www.deq.state.or.us/aq>)

Lane County

1. Country Coach, Inc., Junction City, Oregon
2. Georgia-Pacific Prairie road Panelboard Plant, Eugene, Oregon
3. Georgia-Pacific Resins Inc., Eugene, Oregon
4. Kingsford Manufacturing Company, Springfield, Oregon
5. Lane County Short Mountain Landfill, Eugene, Oregon
6. Lanz Cabinet Shop, Inc., Eugene, Oregon
7. McKenzie Forest Products, LLC, Springfield, Oregon
8. Monaco Coach Corp. -- Coburg, Coburg, Oregon
9. Monaco Coach Corp. -- Springfield, Springfield, Oregon
10. Rosboro Lumber Company, Springfield, Oregon
11. SFPP, L.P. Eugene Terminal, Eugene, Oregon
12. SierraPine Ltd. Springfield Division, Springfield, Oregon
13. Trus Joist MacMillian, Eugene, Oregon
14. Trus Joist MacMillian, Junction City, Oregon
15. Willamette Industries, Inc. Vaughn Laminating Division, Veneta, Oregon
16. Weyerhaeuser Company -- Coburg, Eugene, Oregon
17. Weyerhaeuser Company Eugene MDF, Eugene, Oregon
18. Willamette Industries, Inc. Springfield Plywood, Springfield, Oregon
19. Weyerhaeuser Company Springfield Containerboard, Springfield, Oregon
(Source: http://www.lrapa.org/permitting/issued_permits/title_v_operating_permits.php)

Lincoln County

1. Georgia Pacific West, Inc., Toledo, Oregon
(Source: <http://www.deq.state.or.us/aq>)

Linn County

1. Monaco Coach Corporation, Harrisburg, Oregon
2. WTD Industries, Halsey, Oregon
3. Oregon Strandboard, Brownsville, Oregon
4. Jefferson Smurfit Corp., Sweet Home, Oregon
5. Willamette Industries, Inc., Foster, Oregon
6. Springfield Forest Products, Lebanon, Oregon
7. Entek International LLC, Lebanon, Oregon
8. Dewald Northwest Co., Albany, Oregon
9. Pacific Cast Technologies, Albany, Oregon
10. TDY Industries Inc., Albany, Oregon
11. Willamette Industries Inc., Albany, Oregon
12. Willamette Industries Inc., Albany, Oregon

(Source: <http://www.deq.state.or.us/aq>)

Benton County

1. Oregon State University, Corvallis, Oregon
2. Coffin Butte Landfill, Monmouth, Oregon

(Source: <http://www.deq.state.or.us/aq>)

Polk County

1. Willamette Industries Inc., Dallas, Oregon
2. Medallion Cabinetry Inc., Independence, Oregon
3. Marquis Spas, Independence, Oregon

(Source: <http://www.deq.state.or.us/aq>)

Marion County

1. Kalkustom Enterprises, Salem, Oregon

(Source: <http://www.deq.state.or.us/aq>)

1.5 Data Summary

Tribal Air Quality Data

No air quality data has been collected on tribal lands. Tribal staff are attending trainings and workshops to increase air quality management and monitoring capacity.

Local, State, and Federal Air Quality Data

Tribal staff downloaded all of ODEQ's air quality data set on air quality permitting and monitoring activities. A master GIS shapefile was generated from the ODEQ's data for future air quality analyses and is stored on the Tribe's GIS server. LRAPA is the primary source of air quality data for Lane County.

Figures 8 & 9 were generated from EPA's Air Data (<http://www.epa.gov/oar/data>) website. The Figures show annual emission loads for Criteria and Hazardous Air

Pollution for each Oregon County. As seen in Figure 8, both Douglas and Lane Counties emit a large amount of Criteria Air Pollutants and Hazardous Air Pollutants in 2001.

Figure 7. Oregon's 2001 Criteria Air Pollutants Emissions per County

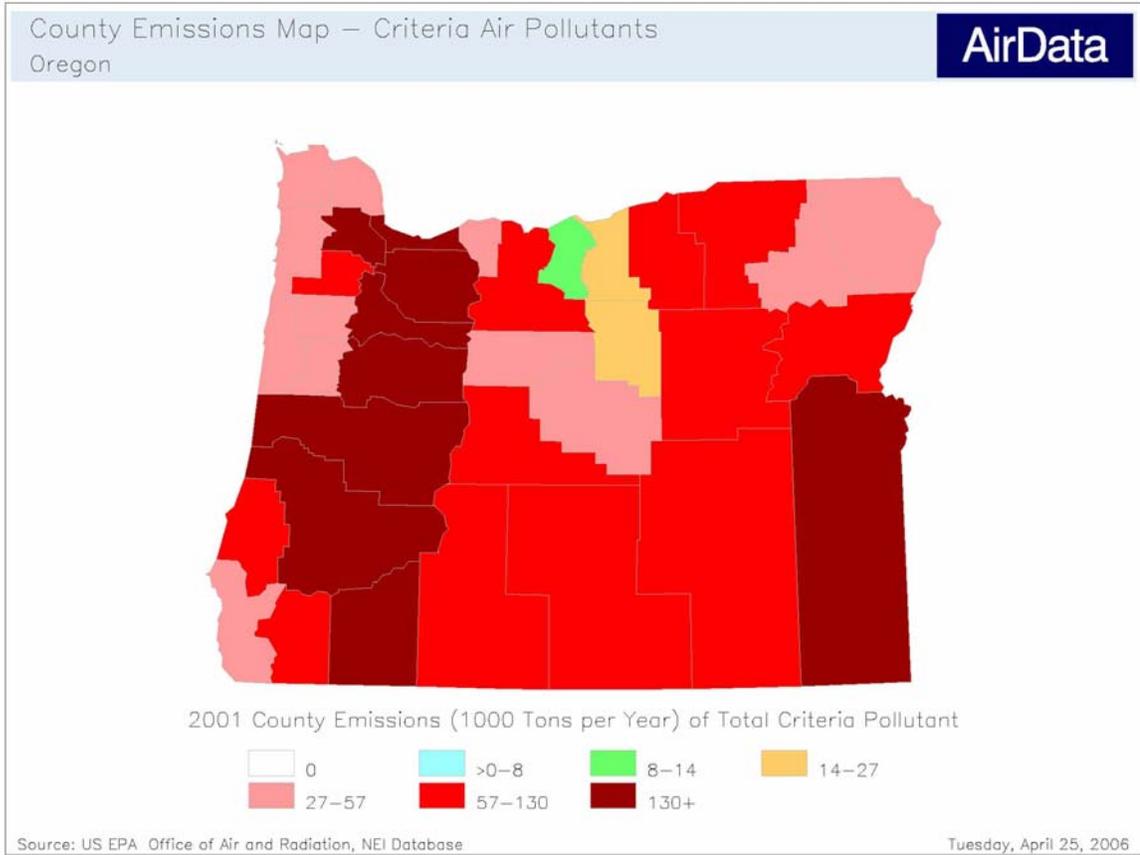
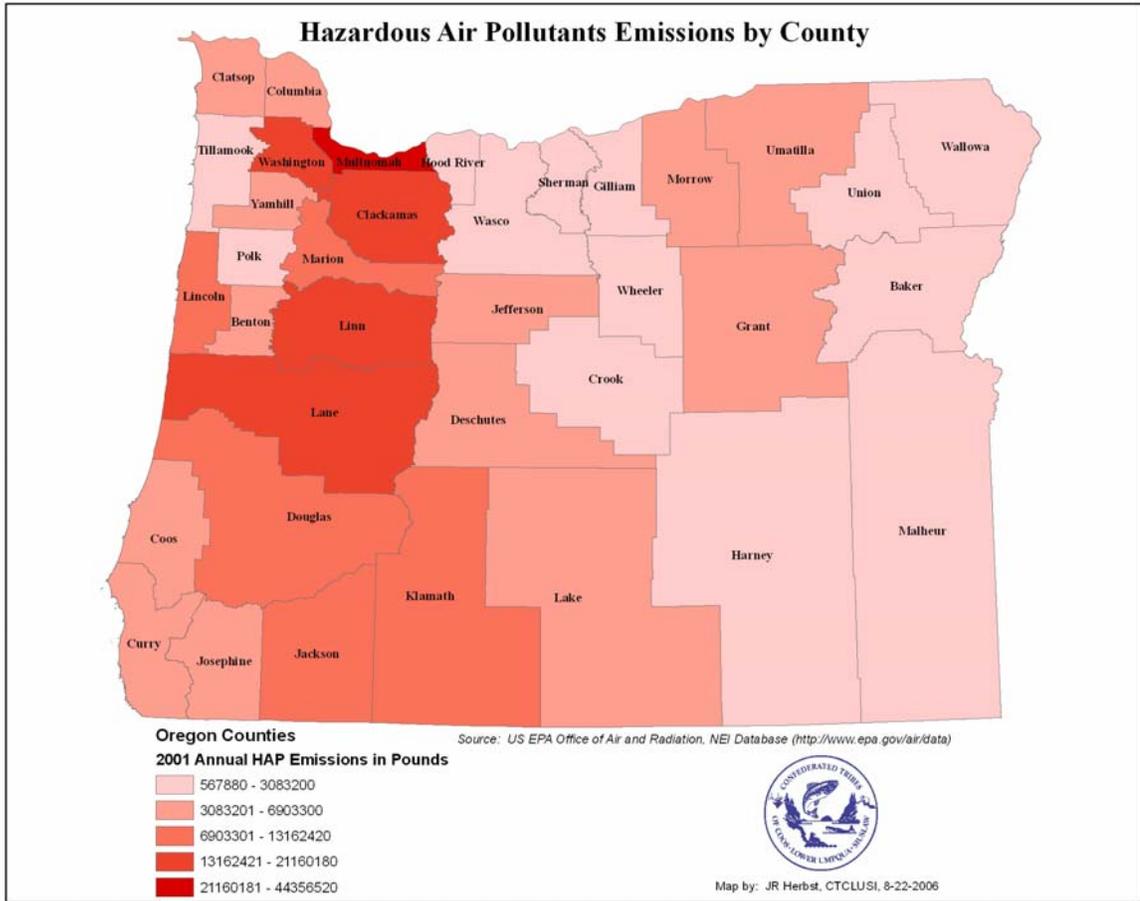


Figure 8. Oregon's 2001 Hazardous Air Pollutants Emissions per County



1.6 Degradation of Visibility

The Tribes have not documented degradation of visibility events due to regional haze.

Oregon Coast Airsheds

Depending on wind direction and velocity, open burning activities can be a source for regional haze on the coast. Wildfires remain an ongoing threat during the dry season.

Willamette Valley Airshed

LRAP has been delegated the authority by EPA to manage air quality in Lane County. LRAPA has identified that degradation of visibility events are associated with high summer ozone events and agriculture burning.

1.7 Recommendation

A majority of the Tribe's resource area of interest is located on the west side of the Coast Range within the Oregon Coast Airshed (OCA). This area of interest does not currently contain the population base or a significant amount of major industrial pollution sources to severely impact overall airshed conditions. Site specific air quality concerns within the airshed may exist and pose a threat to human health. Extended meteorological inversion events that can trap harmful air pollution near the surface don't appear to be a problem for the OCA. Based on a qualitative assessment by the DNR, the airshed above the Tribe's area of interest appears to be a clean when compared to other airsheds throughout Oregon. The lack of any air quality monitoring occurring on the Oregon Coast limits a thorough assessment of current airshed conditions. The DNR recommends that the Tribes develop the ability to monitor ambient and indoor air quality monitoring as a component to the Tribal Air Management Program. An air quality monitoring program will provide the Tribes with a credible quantitative assessment of airshed conditions which will allow the Tribes to track air quality changes over time. The DNR recommends that the ambient air monitoring program begins with the collection of basic meteorological and PM_{2.5} data. Additional ambient air quality monitoring parameters could occur as tribal air quality monitoring capacity expands, monitoring resources become more readily available, and/or specific air pollutants of a concern are targeted by the Tribe.

1.8 Conclusion

The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians continue to develop environmental programs to protect tribal resources and exercise tribal sovereignty. The development of a tribal air management program provides the Tribes with a mechanism to manage air quality on all tribal lands, protect and educate tribal members on air quality issues, and implement programs mandated under the Clean Air Act's Tribal Authority Rule.

1.9 Sources Cited

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<http://www.epa.gov>

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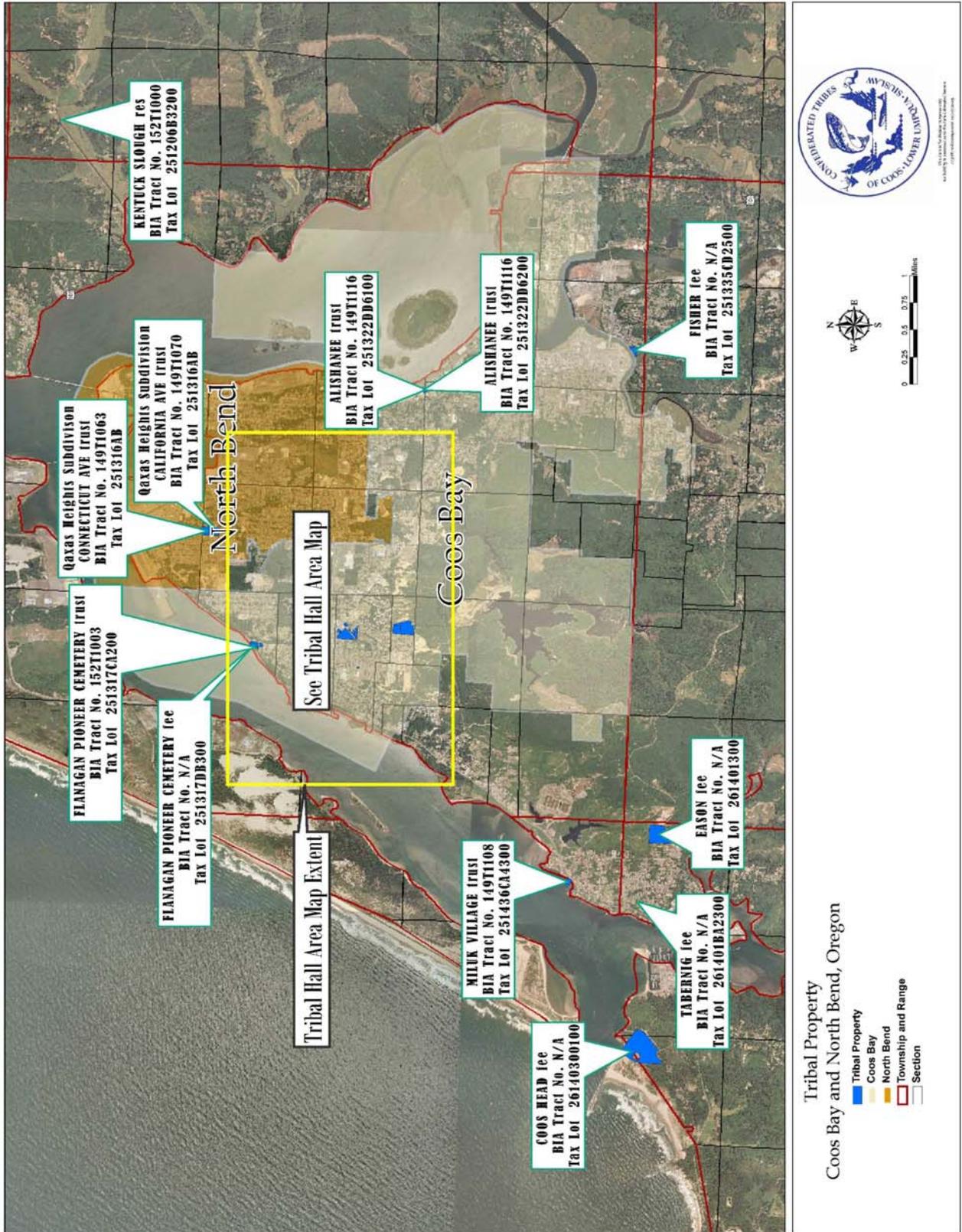
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2005 Oregon Air Quality Data Summaries
<http://www.deq.state.or.us/aq/forms/annrpt.htm>

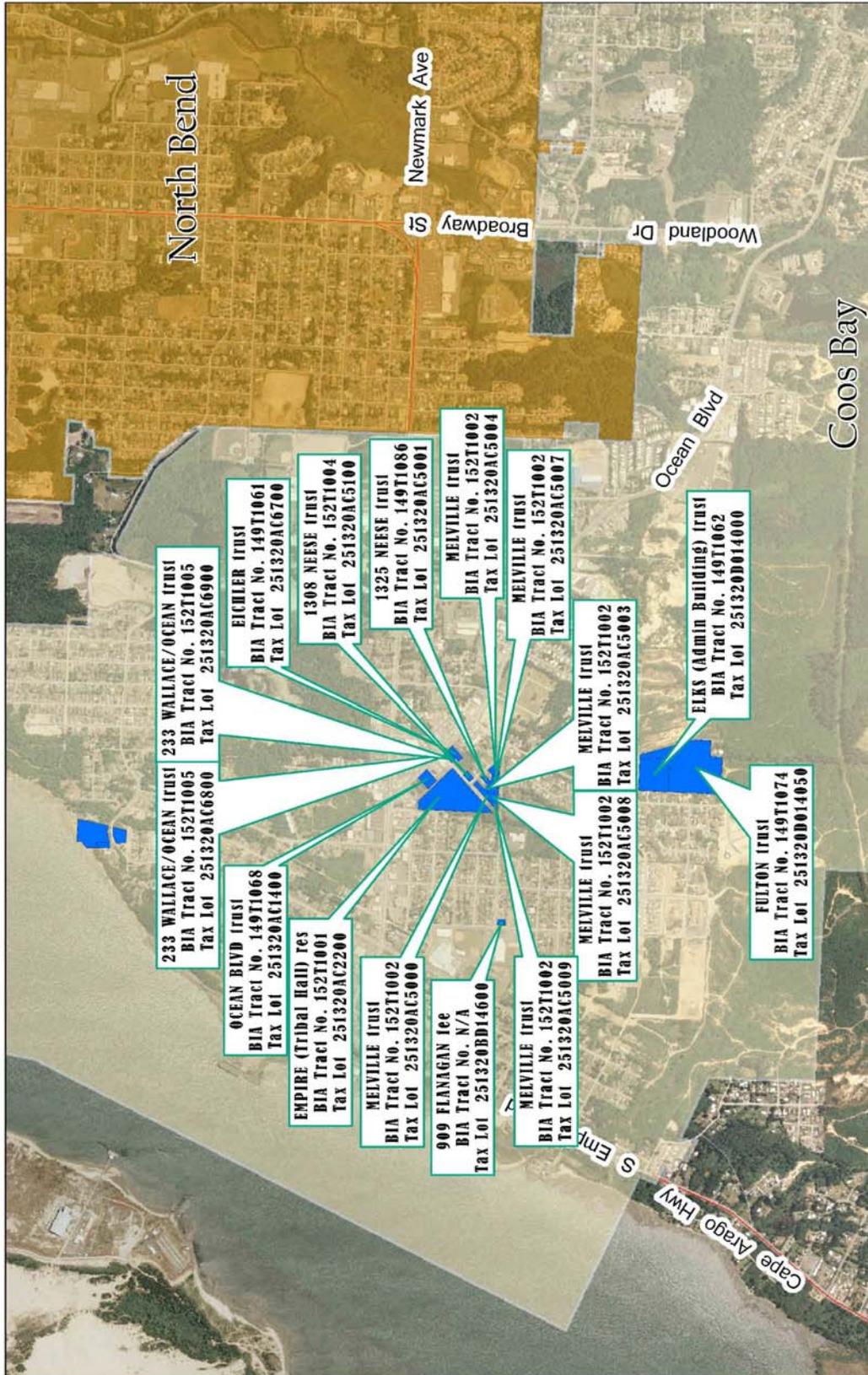
Lane Regional Air Pollution Association
www.lrapa.org

Appendix A – Tribal Holdings

Coos County Properties – Coos Bay/North Bend



Coos County Properties – Tribal Hall Area



CONFEDERATED TRIBES
OF COOS-LOWER UMPQUA-ROGUE RIVERS

Tribal Hall Area Properties
Coos Bay and North Bend, Oregon

- Tribal Property
- Coos Bay
- North Bend

Lane County Properties – Springfield, Oregon



Lane County Properties
Springfield, Oregon

- Tribal Property
- Springfield
- Highways

CONFEDERATED TRIBES
OF COOS-LOWER UMPQUA
AND UPPER WILLAMETTE RIVERS, OREGON

MADE BY THE BUREAU OF LAND MANAGEMENT, U.S. DEPARTMENT OF AGRICULTURE

Curry County Property – Sixes River, Oregon



Curry County Property
Sixes River Topo Map - 42124g3

Tribal Property
Highways

0 400 800 1,200 1,600 Feet

CONFEDERATED TRIBES
OF COOS-LOWER UMPQUA
& SISKIYOU TRIBES

Map data by National Geographic, 2005
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Appendix B - Pollutants: Properties, Health and Welfare Effects

EPA has identified pollutants that are hazardous in ambient concentrations and people who are most sensitive to them. In general the pollutants can cause the following health effects. (Source: <http://www.deq.state.or.us/aq/forms/annrpt.htm>)

General Health Effects`

People most susceptible to severe health problems from air pollution are:

- Individuals with heart or lung disease
- Individuals with respiratory problems such as asthma or emphysema
- Pregnant women
- Outdoor workers
- Children under age 14 (their lungs are still developing)
- Athletes who exercise vigorously

High air pollution levels can cause immediate health problems:

- Aggravated cardiovascular and respiratory illness
- Added stress to heart and lungs, which must work harder to supply oxygen.
- Damaged cells in respiratory system

Long-term exposure to polluted air can have permanent health effects:

- Accelerated aging of the lungs and loss of lung capacity
- Decreased lung function
- Development of diseases such as asthma, bronchitis, emphysema, and possibly cancer
- Shortened life span

The pollutants EPA has identified as hazardous are:

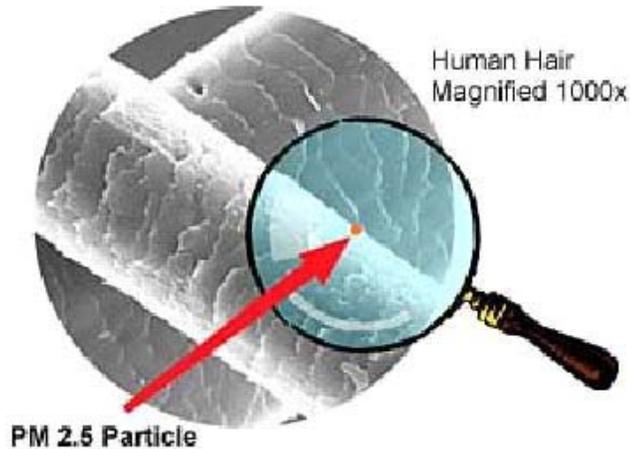
Fine Particulate (PM₁₀ and PM_{2.5})

Fine particulate air pollution consists of solid particles or liquid droplets that are less than 10 microns in diameter (PM₁₀) or less than 2.5 microns in diameter (PM_{2.5}). Particles in these size ranges are of great concern because they can be inhaled deeply into the lungs where they can remain for years. The health effects of particulate matter vary with the size, concentration, and chemical composition of the particles. In general, particulate matter causes three kinds of health problems:

- The particles may be inherently toxic because of their chemistry.
- The particles may mechanically damage the respiratory system.
- The particles may be carriers for adsorbed toxic substances.

Relationships have been shown between exposure to high concentrations of particulate matter and increased hospital admissions for respiratory infections, heart disease, bronchitis, asthma, emphysema, and similar diseases. In addition, there may be several potential carcinogens present on particulate matter. Of particular concern are the

condensed organic compounds released from low temperature combustion processes (wood stoves, for example). Among the most obvious effects of fine particles are reductions in visibility due to absorption and scattering of light by suspended particles. Almost all smoke particles from residential wood stoves and fireplaces, industrial boilers, field burning, and other combustion processes can be characterized as fine particulate and most of it is thought to be PM_{2.5}. In contrast, only a small fraction of the particles from road dust, agricultural tilling, and wind blown dust are fine particulate.



Total Suspended Particulate (TSP)

Pollution made up of particulate less than about 100 micro-meters in diameter is called TSP (100micrometers is about the diameter of a human hair.) Larger particles tend to settle out of the air quickly and are often more of a nuisance than a health affecting pollution problem. In addition to health problems caused by the fine particulate component of TSP (see PM₁₀ & PM_{2.5}), it may cause soiling and corrosion of building materials and textiles, damage to vegetation, and toxicity to animals that feed on vegetation covered by toxic particulate matter. Natural sources of TSP include pollen, wind-blown dust, and smoke from wild fires. Humans create TSP from combustion sources--like motor vehicles, utility and industrial boilers and dryers, wood stoves, open burning, slash burning, and field burning. Other anthropogenic sources include dust from roads, agriculture, construction, and mining.

Sulfur dioxide (SO₂)

Sulfur dioxide is a colorless, pungent gas. In the body it acts as a lung and eye irritant. When SO₂ is inhaled, it causes bronchial constriction which results in breathing difficulty and increased pulse and respiratory rate. People with respiratory diseases like asthma, bronchitis, or emphysema are particularly susceptible to the effects of SO₂. When particles capable of oxidizing sulfur dioxide to sulfuric acid are present, the irritant response increases in magnitude by two to three times. When sulfuric acid is inhaled, mucous production increases. This reduces the respiratory system's ability to remove particulate matter, and can lead to more severe respiratory infections, such as pneumonia.

Chronic exposure to SO₂ can lead to coughing, shortness of breath, fatigue, and bronchitis. Sulfur dioxide can also damage plants and building materials. The leaves of some vegetables (spinach and lettuce, for example) are damaged by exposure to high levels of SO₂. Sulfur oxides accelerate corrosion of metals and other building materials (limestone, marble, mortar) by forming sulfuric acid on the surface of the material or in the atmosphere. In addition, sulfuric acid and sulfate particles formed in the atmosphere from SO₂ can cause scattering of visible light, thus contributing to haze. These same processes can contribute to acid rain and lead to acidification of lakes and soils. The major source of SO₂ nationwide is combustion of high sulfur coal. In Oregon, where burning of high sulfur coal is not allowed, heating oil, and low sulfur coal are the major combustion sources of Sulfur dioxide.

Carbon monoxide (CO)

Carbon monoxide is a colorless, odorless gas. In the body, CO binds tightly to hemoglobin (the red pigment in blood which transports oxygen from the lungs to the rest of the body). Once hemoglobin is bound to CO, it can no longer carry oxygen. In this way, CO reduces the oxygen-carrying capacity of the blood and can result in adverse health effects. High concentrations of CO strongly impair the functions of oxygen-dependent tissues, including brain, heart, and muscle. Prolonged exposure to low levels of CO aggravates existing conditions in people with heart disease or circulatory disorders. There is a correlation between CO exposure and increased hospitalization and death among such patients. Even in otherwise healthy adults, carbon monoxide has been linked to increased heart disease, decreased athletic performance, and diminished mental capacity. Carbon monoxide also affects newborn and unborn children. High CO levels have been associated with low birth weights and increased infant mortality.

A major natural source of CO is spontaneous oxidation of naturally occurring methane (swamp gas). The major human-caused source is incomplete combustion of carbon-based fuels, primarily from gasoline-powered motor vehicles. Other important sources are wood stoves and slash burns. How a motor vehicle is operated has an effect on the amount of CO emitted. In stop-and-go driving conditions, CO emissions are high. Emissions are also increased when the outside temperature is low. Oregon's most serious CO problems occur during the winter in urban areas when CO emitted by slow-moving traffic is trapped near the ground where people can inhale them.

Ozone (O₃)

Ozone (a component of smog) is a pungent, toxic, highly reactive form of oxygen. A new eight hour standard protects the public against lower level exposures over a longer time period which has been found to be more detrimental than shorter peak levels. The long term exposure effects cause significant breathing problems, such as loss of lung capacity and increased severity of both childhood and adult asthma. Ozone causes irritation of the nose, throat, and lungs. Exposure to ozone can cause increased airway resistance and decreased efficiency of the respiratory system. In individuals involved in strenuous physical activity and in people with pre-existing respiratory disease, ozone can cause sore throats, chest pains, coughing, and headaches. Plants can also be affected. Reductions in growth and crop yield have been attributed to ozone. Ozone can affect a variety of materials, resulting in fading of paint and fiber, and accelerated aging and cracking of

synthetic rubbers and similar materials. It is also a major contributor to photochemical smog. Ozone is not emitted directly into the air. It is formed through a series of photochemical (sun light requiring) reactions between other pollutants and oxygen (O₂) during hot weather. Most important are nitrogen oxides and volatile organic compounds. To control ozone pollution, it is necessary to control emissions of these other pollutants. It is primarily caused by chemicals from car and small engine exhaust, and business and industry emissions on hot sunny days.

Nitrogen dioxide (NO₂)

Nitrogen dioxide is a reddish-brown gas that is toxic in high concentrations. It is a lung irritant and may be related to chronic pulmonary fibrosis. It is also important in the photochemical reactions leading to the formation of ozone. It can cause indirect damage to materials when it combines with moisture in the air to form nitric acid. The nitric acid can then cause corrosion of metal surfaces and can also contribute to acid rain. In addition, NO₂ absorbs visible light and causes reduced visibility. It has also been linked to suppressed growth rates in some plants. The major human-caused source of NO₂ is fuel combustion in motor vehicles, and utility and industrial boilers. Nitric oxide (NO) is the major nitrogen oxide produced during the combustion process, but once in the atmosphere, NO is rapidly oxidized to form NO₂.

Hydrocarbons (Non-Methane)

Non-methane hydrocarbons (also know as Volatile Organic Compounds) are a large family of compounds made up primarily of hydrogen and carbon. These compounds are instrumental in the complex series of reactions leading to the formation of ozone and photochemical smog. The compounds come mainly from motor vehicles, fuel evaporation, the coatings industry, and combustion processes. The EPA has repealed its standard for non-methane hydrocarbons and DEQ has taken similar action, however, hydrocarbons are still controlled because of their contribution to ozone formation.

Air Toxics

Air toxics are generally defined as air pollutants known or suspected to cause serious health problems, like birth defects and cancer. The U.S. EPA regulates 188 air toxics (hazardous air pollutants). The EPA used 1996 emission inventory data to estimate concentrations of 33 of these toxics in the air, nationwide. According to EPA's National Air Toxics Assessment, there are 16 toxic air pollutants in Oregon's air modeled at levels more than 10 times the federally determined safe level. These substances are Acetaldehyde, Acrolein, Arsenic, Benzene, 1,3-Butadiene, Beryllium, Carbon tetrachloride, Chloroform, Chromium, diesel particulate matter, Ethylene dibromide, Ethylene dichloride, Formaldehyde, Perchloroethylene, polycyclic organic matter (POM), and Nickel. All of these substances, except Acrolein, are known or suspected to cause cancer. Other air toxics in Oregon are believed to be below levels of concern. Of these chemicals, current measurement methods cannot detect Carbon tetrachloride, Chloroform, Ethylene dibromide or Ethylene dichloride. At the time of this report, measurement methods were not available to measure Acrolein, Beryllium or diesel particulate matter.

Acetaldehyde

Acetaldehyde is a colorless flammable liquid that evaporates when exposed to air. It has a pungent odor, but smells fruity at dilute concentrations. Acetaldehyde occurs naturally in some foods, including ripe fruit and coffee.

Acetaldehyde forms as a product of incomplete wood combustion, coffee roasting, burning tobacco, and vehicle exhaust fumes. Residential fireplaces and woodstoves are the two largest sources of acetaldehyde. Health effects from breathing small amounts of acetaldehyde over long periods are uncertain. EPA has classified acetaldehyde as a probable human carcinogen.

Arsenic and Compounds

Arsenic is a natural element in the earth's crust that occurs in two different forms, organic and inorganic. Organic arsenic contains carbon and hydrogen and occurs in plants and animals. Inorganic arsenic typically contains elements such as oxygen, chlorine, and sulfur. Inorganic arsenic is the more harmful of the two. Inorganic arsenic is ubiquitous in the environment. Volcanoes release it into the air, as does the weathering of arsenic-containing minerals and ores. Commercial and industrial processes like metal smelting and power generation from fossil fuels also release arsenic, as does burning wood treated with arsenic. Inorganic arsenic can settle from the air to the ground. Food is the largest source of inorganic arsenic exposure for most people, primarily due to pesticide use on crops. Inorganic arsenic is a human poison. High levels (60 parts per million or more) in food or water can be fatal. Arsenic damages many tissues including nerves, stomach and intestines, and skin. Lower levels of exposure to inorganic arsenic may cause nausea, vomiting, and diarrhea, decreased production of red and white blood cells, abnormal heart rhythm, blood vessel and nerve damage. Breathing inorganic arsenic increases the risk of lung cancer. EPA has classified inorganic arsenic as a known human carcinogen.

Benzene

Benzene is a colorless flammable liquid with a sweet odor that evaporates easily. It comes from both natural processes and human activities. Benzene is widely used in the United States and ranks in the top 20 chemicals for production volume. Benzene is used in the processes that make plastics, resins, and nylon and synthetic fibers. It is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources include volcanoes and forest fires. Other sources are coal, oil, and wood combustion, car/truck exhaust, and evaporation from gas stations and industrial solvents. Tobacco smoke contains benzene and accounts for approximately 50% of our exposure. Long-term inhalation of benzene causes many disorders including anemia, excessive bleeding, damage to the immune system and genetic damage. On the job exposure to benzene has been shown to produce an increased incidence of leukemia (cancer of the tissues that form white blood cells). EPA has classified benzene as a known human carcinogen.

1,3-Butadiene

1,3-Butadiene is a colorless gas with a mild gasoline odor. It is a combustion product found in motor vehicle exhaust, gas, oil, and wood furnaces, and industrial processes. 1,3-Butadiene is also manufactured and used in making plastics. Studies have shown that

long-term inhalation of 1,3-butadiene can result in an increased incidence of cardiovascular diseases, including rheumatic and atherosclerotic heart diseases (hardening of the arteries) and can cause blood disorders. EPA has classified 1,3-butadiene as a probable human carcinogen.

Chromium and Compounds

Chromium is a geological metal found in rocks, soil, volcanic dust and gases, plants, and animals. Chromium metal is used mainly for making steel and other alloys. Chromium compounds are also used to manufacture dyes and pigments, and in leather and wood preservation. Manufacturing, chrome plating, or burning fossil fuels can release chromium to the air. Chromium particles can settle from the air and persist in soil. Chromium occurs in several forms, one of which is chromium VI. Long-term inhalation of chromium VI causes respiratory tract damage. Studies suggest that exposure to chromium VI may result in complications during pregnancy and childbirth. Inhalation of chromium VI can also increase the risk of lung cancer. EPA has classified chromium VI as a known human carcinogen. The most common form of chromium, chromium III, is not known to cause cancer and is less toxic.

Formaldehyde

Formaldehyde is a colorless gas with a pungent odor. It is a common combustion product, produced by human activities but also occurs naturally. The highest levels can occur indoors and tobacco smoke is an important source. Major outdoor sources of formaldehyde are power plants, manufacturing facilities, incinerators and car exhaust. Chronic exposure to inhaled formaldehyde is associated with respiratory symptoms and eye, nose, and throat irritation. Increased incidences of menstrual disorders and pregnancy problems have been observed in women workers using urea-formaldehyde resins. Studies of workers have shown significant associations between exposure to formaldehyde and increased incidence of lung and nasal cancer. EPA considers formaldehyde to be a probable human carcinogen.

Nickel and Compounds

Nickel is a very abundant element. In the environment it is usually combined with oxygen (nickel oxides) or sulfur (nickel sulfides). Nickel is a hard silvery white metal that is combined with other metals to form mixtures called alloys. Nickel is used to make metal coins and jewelry and in industry for making many metal items. It is also used for electroplating baths, batteries, spark plugs and machinery parts. Since so many consumer products contain nickel it is released when municipal garbage is incinerated. Respiratory effects, including chronic bronchitis and reduced lung function, have been observed in workers who breathe large amounts of nickel. Nickel may also cause reactions in sensitive skin upon contact. Some people react if they consume nickel in food or water, or react if they breathe it. EPA has classified several forms of nickel as known or probable human carcinogens.

Perchloroethylene

Perchloroethylene, also called Perc or tetrachloroethene, is a nonflammable colorless liquid with a sharp, sweet odor. Most of us know it as dry-cleaning fluid.

In addition to dry-cleaning, perchloroethylene is used in textile processing, chemical manufacturing, and as a degreasing agent in metalworking. It is also used as a solvent. Exposure to high levels of perchloroethylene can cause acute human health effects. These effects include central nervous system damage, kidney dysfunction, and severe respiratory irritation. Long term, low level exposures can cause neurological impairment, and severe liver and kidney damage. EPA has classified perchloroethylene as a possible human carcinogen.

Polycyclic Organic Matter (POM)

The term Polycyclic Organic Matter defines a class of compounds that includes the polynuclear aromatic hydrocarbons (PAHs). These compounds exist either as gases or particulates in the air. Combustion is the primary source of most POMs. Air emissions sources include vehicle exhaust, forest fires, residential wood and backyard burning, agricultural burning, and asphaltting roads. Information about short and long-term human health impacts is limited. Long-term exposure to one form of POM, benzo(a)pyrene, has resulted in dermatitis, eye irritation, and reduced fertility. Cancer is the major concern from long-term exposure based on animal research. EPA has classified most POM compounds as probable human carcinogens.

Lead (Pb)

Lead is a toxic heavy metal, abundant in the earth's crust. Air borne lead particles are of sufficiently small size (less than 0.7 microns) that they can penetrate deep within the lungs and ultimately be absorbed in the blood. High concentrations of lead in the blood can cause severe and permanent brain damage, especially in children. Lower levels have vague, non-specific symptoms, including headaches, malaise, stomach pains, irritability, and pallor. Damage can be caused to heart, kidney, liver, and nerve and blood tissues. The major lead source in the air was from leaded gasoline. This one source accounted for close to 90 percent of the U.S. annual lead emissions. Because leaded gasoline was eliminated, the ambient lead levels have dropped substantially.

Visibility

Visibility impairment may be caused by meteorological effects (clouds, rain), man-made pollution (open burning, industry), and natural pollution (wildfire, dust storms). The Department monitors visibility conditions in selected Oregon Class I (or pristine) areas during the summer months. Information from the monitoring is used to determine the extent of man-made visibility impairment, and to evaluate the effectiveness of the Department's Visibility Monitoring Program. In 1986, regulations were adopted to minimize visibility impairment in the North and Central Cascade wilderness areas. The goal of the regulations is to reduce the frequency of visibility impairment by 60 to 90 percent over 1982-84 levels.

Appendix C – National Ambient Air Quality Standards (NAAQS)

The Clean Air Act requires EPA to set NAAQS (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards.

Primary standards set limits to protect public health, including the health of "sensitive" populations 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.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. They are listed in the table below. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$).

Pollutant	Averaging Time	National Ambient Air Quality Standard (NAAQS) Violation Determination¹	Federal Standard (NAAQS) Exceedance Level	Oregon State Standard Exceedance Level
Carbon Monoxide	1-hour	Not to be exceeded more than once/year.	35 ppm	35 ppm
	8-hour	Not to be exceeded more than once/year.	9 ppm	9 ppm
Lead	Calendar Quarter	Quarterly arithmetic mean	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Dioxide	Annual	Annual arithmetic mean	0.053 ppm	0.053 ppm
Ozone	1-hour	The expected number of days per calendar year with max hourly average concentrations above 0.12 ppm is equal to or less than 1.	0.12 ppm	0.12 ppm
	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average concentration.	0.08 ppm	
PM2.5	24 hour	98th percentile of the 24-hour values determined for each year. 3-year average of the 98th percentile values.	65 µg/m ³	
	Annual Average	3-year average of the annual arithmetic mean	15 µg/m ³	
PM10	Annual Average	3-year average of the annual arithmetic mean	50 µg/m ³	50 µg/m ³
	24 hour	The expected number of days per calendar year with a 24-hour average concentrations above 150 µg/m ³ is equal to or less than 1 over a 3-year period.	150 µg/m ³	150 µg/m ³
Sulfur Dioxide	Annual Arithmetic Mean	Not to be exceeded more than once per calendar year.	0.03 ppm	0.02 ppm
	24 hour	Not to be exceeded more than once per calendar year.	0.14 ppm	0.10 ppm
	3 hour	Not to be exceeded more than once per calendar year.	N/A	0.050 ppm