

Strategy for the Development of an Airshed Management Program for the Treasure Valley

acknowledgements

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purpose

The goal of airshed management is to prevent deterioration of air quality through proactive planning to ensure protection of public health.

This document provides an overview of the Idaho Department of Environmental Quality's (DEQ) Airshed Management initiative for managing air pollution. It is not intended to be a comprehensive review of local air pollution issues and studies, nor is it intended to definitively describe all components of a fully developed Airshed Management program. Rather, it is intended to explain the basic tenets of airshed management, describe the reasons why DEQ believes the Airshed Management approach is necessary in the Treasure Valley, and provide a framework for the development of a comprehensive Airshed Management Program. It includes a five-year schedule for developing a document to fully detail the Treasure Valley Airshed Management Program.

The Treasure Valley Airshed Management Program will be adapted for application in other areas of Idaho, including Pocatello, the Rathdrum Prairie, and Lewiston.

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Section 1

introduction to airshed management



what is an airshed?

An **airshed** is an area covered by a volume of air that has similar characteristics and is separated from other volumes of air by weather patterns or topography. Air pollution that is emitted in one area will spread out and become distributed across the airshed. For this reason, air pollution levels are generally similar across a given airshed.

The boundaries of an airshed can be difficult to determine due to changing conditions. Ridges and mountains prevent the circulation of air, and hold pollution within their boundaries. But weather conditions change on a daily basis, and features that obstruct the movement of air on some days may represent no barrier at all when a weather front pushes through.

Under normal circumstances, air near the ground heats up during the day. Hot air is lighter, causing it to rise. Cooler air rushes in to take its place near the ground. This constant circulation mixes polluted air with cleaner air, and helps flush out pollution. When air is calm or **stagnant**, pollution tends to stay near the same area that it is emitted, allowing concentrations to build up. Layers of different temperatures in the air can create a "lid" that holds pollution in. This "lid" is called the **mixing height**, or the elevation up to which pollutants

are mixed. Low mixing heights keep the air beneath stagnant, and pollutants trapped near the ground.

DEQ bases the boundaries of local airsheds on meteorological data from time periods when air is least able to mix, and air pollution levels are expected to be highest.

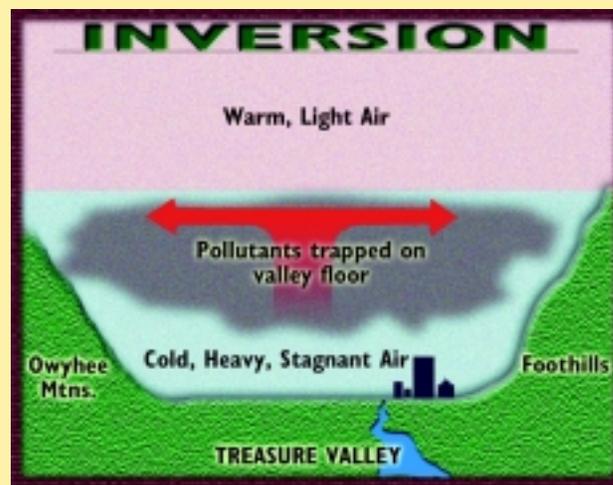


Figure 1. Diagram of inversion

methods of air quality management

DEQ is working toward managing air quality consistently across an entire airshed, as opposed to methods used in the past, which were based on political boundaries. Idaho has traditionally focused on addressing air pollution problems through prescriptive means dictated by the Environmental Protection Agency (EPA).

As required by the federal Clean Air Act, areas that measure violations of the **National Ambient Air Quality Standards** are designated **nonattainment** for that pollutant. These areas are subject to more regulations and restrictions than areas with good air quality. Sanctions such as withholding federal highway dollars may be implemented in these areas. Under the requirements of the federal Clean Air Act, the State is responsible for developing an Air Quality Improvement Plan that explains how the problem will be corrected. The Plan must be submitted to the EPA for approval. Once approved, the document and its requirements become federally enforceable. Developing this type of reactive Plan is expensive, and the solutions may be burdensome. If a State fails to prepare a Plan, the federal government will step in to develop the clean-up plan for the area. The traditional type of management has resulted in dramatic reductions in pollution concentrations in problem areas. However, managing air pollution based on political boundaries and in response to existing problems is not the most efficient means of ensuring healthy air quality.

The science of air pollution points to managing air quality on an airshed basis, rather than targeting specific counties. Of course, air pollution does not stop at county or state lines. Pollution created in one area may travel many miles, affecting the air quality of other areas. When adjacent areas all have sources that contribute to air pollution levels, it is inequitable to place all of the burden for controlling that air pollution on the residents and businesses of one community. Managing air pollution sources only within nonattainment areas can not solve an airshed-wide problem.

Idaho DEQ has redirected its focus toward managing air pollution consistently and proactively across an entire airshed. This approach is called **Airshed Management**. The primary goal is to ensure protection of public health. Airshed Management is based on involving the community in developing community visions and goals for air quality; collecting and evaluating scientific information; developing voluntary, locally directed strategies to protect public health and reach community goals; and de-politicizing the implementation of air quality protection strategies. Its goal is to plan for good air quality on a longer horizon than traditional

approaches, looking out 20 to 25 years. It also addresses all pollutants of concern in an area holistically, rather than addressing each separately, which can be inefficient and counter-productive. The approach relies on communities, the public, and businesses making choices that will help prevent future problems.

The Airshed Management approach is a voluntary effort, and is designed to avoid future problems in air pollution and to meet the communities' wishes for air quality. DEQ will incorporate all Clean Air Act requirements into the Airshed Management approach. However, if violations of the national health-based air quality standards are measured at any time, DEQ must resolve the public health threat under the regulatory framework of the federal Clean Air Act. This will involve reverting to traditional pollution control strategies.

airshed management: moving from *fixing* to *preventing*

Managing air pollution proactively can help us avoid the pitfalls of traditional air pollution management. Once a problem has developed, it may take years to resolve, subjecting the public to unacceptably high pollution levels and health risks. In addition, waiting until a problem develops can result in the need for expensive "retro-fit" solutions. Developing an Air Quality Improvement Plan in response to a nonattainment designation is costly because extensive data collection, modeling, and documentation must be accomplished in a short period of time. Control strategies become part of a federally enforceable document, resulting in less flexibility and less local control. Stringent permit regulations apply in a nonattainment area, which may affect production costs and discourage new or expanding businesses. Other negative effects of increased air pollution include reduced crop yield, damage to the environment, and damage to the scenic image of an area. Managing air pollution proactively across the entire airshed can reduce or eliminate these problems, as well as ensure that the burden of planning and protecting air quality is shared among all contributors to local air quality.

There are concerns with applying an Airshed Management approach. For example, to be successful, the Airshed Management approach will require that all pollution sources work together to achieve the community's objective of clean air. DEQ may need additional authority to regulate some sources of air pollution that are not currently regulated under the Idaho Rules or the Clean Air Act. Examples of these types of sources include agriculture and older, **grandfathered** industrial sources. As some of these

sources have not been asked to participate in air quality protection previously, there may be resistance or concern. Also, managing pollution from numerous small, individual sources, such as motor vehicles, can be a challenge. While emissions tests are effective in reducing excessive emitters, constant increases in the sheer number of vehicles can overwhelm this benefit. Developing and improving functional and convenient transportation alternatives to alleviate this problem could be difficult.

elements of airshed management

Airshed Management has two basic components. One is a commitment to collect accurate data and develop good scientific understanding of the air pollution dynamics in each airshed. This will ensure that any proposed strategies to manage pollution will be effective. The other is to engage the community, residents, and businesses of the airshed in decisions about the best course for protecting air quality. The communities in an airshed will be involved in establishing an air quality vision and goals for their area.

Based on these two components, science and community involvement, strategies to protect air quality will be developed. These may include community-based strategies such as local ordinances or programs, or strategies that DEQ will oversee through regulations or policies.

It is essential that strategies designed to protect air quality be applied consistently and fairly across the entire airshed. This will help to de-politicize implementation of control strategies. DEQ will work to ensure that its policies and regulations are consistent across each airshed, and will encourage adoption of uniform community strategies across the valley.

DEQ will provide regular communication on the progress toward realizing the community air quality goals through its airshed advisory groups, regular public meetings, and outreach campaigns targeting elected officials, businesses, and the general public.

legal authorities

DEQ is required by the Idaho Environmental Protection and Health Act (EPIA) to supervise and administer a system to safeguard air quality in the State of Idaho.¹ DEQ's Board of Directors may formulate and adopt rules, regulations, codes and standards deemed necessary to deal with problems related to air pollution.² With the exception of nonattainment areas, neither the EPIA nor the Rules for the Control of Air Pollution in Idaho dictate how specific area air quality issues should be managed. Rather, the law gives DEQ broad authority to administer a system to safeguard air quality. It may be determined while developing the Treasure Valley Airshed Management Plan that certain items should be adopted in the Rules. If so, DEQ will undergo rulemaking procedures.³



Figure 2. Relationship among the main elements of Airshed Management.

Section 2

the treasure valley airshed



The Treasure Valley is situated in southwest Idaho in a shallow geological basin in the Snake River Plain. A series of river benches and mountain ranges create a barrier to air flow in and out of this basin. All of Ada and Canyon Counties are contained within this valley, as well as portions of other counties. The Treasure Valley is the largest and most populated urban area in Idaho, containing about one-third of the State's population.

Ada County was designated as a nonattainment area for particulate matter and carbon monoxide years ago. While violations of air quality standards have not been measured in Canyon County since monitoring began, rapid growth is occurring in this area. Air quality monitoring and meteorological data indicate that the entire Treasure Valley shares a single airshed. Particulate matter pollution levels are often consistent across the valley. Carbon monoxide levels also fluctuate uniformly.

Most of the time, the Treasure Valley airshed can absorb the pollution released into it. However, there

are times when the capacity of the airshed to disperse air pollution is significantly reduced. This occurs when the air in the Treasure Valley basin becomes **stagnant** and resistant to mixing with air from other areas.

Temperature inversions are common during the winter, particularly in late December and early January. An **inversion** occurs when heavy, cold air is trapped near the ground beneath warmer, lighter air. This condition suppresses the movement of air, allowing pollution to build up over several days. A severe inversion has not occurred in this area since 1991, when exceedances of air quality standards were last measured.

DEQ is concerned that, with a severe temperature inversion, a violation of the particulate matter air quality standards might occur. DEQ is also concerned about future air quality in the valley. As the area grows, emissions will increase. Increased pollution along with unfavorable weather conditions combine to create an airshed that needs careful protection.

Air pollution concerns facing the valley are complex. Some of the difficulty is due to numerous small

sources of pollution, especially motor vehicles. Adding to the complexity, some substances can chemically react in the air to create more hazardous **secondary pollutants**. These secondary pollutants, and the **precursors** that create them, can migrate over long distances and contribute to pollution problems across a wide area.

Ada and Canyon Counties share a single airshed and are part of a growing metropolitan area. As the separation between urban areas across the valley becomes less distinct, planning for the transportation and future growth is beginning to be done in conjunction. It is essential that air quality planning also focus on the entire region.

boundaries of the treasure valley airshed

DEQ determines airshed boundaries by examining topographical barriers to air movement such as mountains or ridges, as well as local weather conditions that would affect pollution build-up.

In the Treasure Valley, the Boise Front, a mountain range roughly 1,800 meters high (*about 6,000 feet*), extends generally east-west, and creates a barrier to air flow on the northeastern edge of the valley. To the south a series of river benches, the Snake River, and the Owyhee Mountain Range all impact air flow. The path taken by the Snake River outlines the southern boundary of both Ada and Canyon Counties.

In the Treasure Valley, mixing heights are typically lowest and pollution levels are highest during the winter season. Using radar soundings and weather balloons to determine temperature differences in the layers of air, climatologists have documented that the average mixing height in the Treasure Valley area during winter months is 300 meters (*about 1,000 feet*) or less above the surface of the valley.⁴

Using an average valley elevation of 750 meters (*about 2,500 feet*) plus the mixing height of 300 meters, an elevation of 1,100 meters (*about 3,500 feet*) above sea level was determined to be the elevation of the Treasure Valley's local wintertime airshed barrier.

A line at 1,100 meters was overlaid across the topographical features of the valley and was used as the initial basis for describing the extent of the Treasure Valley airshed. This elevation line outlines an area that includes Ada and Canyon Counties, as well as portions of Oregon, and Owyhee, Elmore, Gem and Payette Counties, and portions of Oregon.

To facilitate development of the Airshed Management Program, DEQ evaluated some additional restrictions for the management area. We considered distance from the population centers and pollution sources, smaller ridge lines, and political boundaries where they corresponded closely to the 1,100 meter elevation line. This led us to exclude some areas from the initial definition.

- A slight elevation increase extends across the Ada/Elmore County boundary to the east. DEQ assumes that this slight rise, along with the distance between populated areas where pollutants may be emitted, prevents any significant exchange of air pollutants with Elmore County, particularly on stagnant days. To simplify the administration of air quality management strategies, the eastern boundary of the airshed will initially be placed along the Ada/Elmore County boundary.
- Sources in eastern Oregon may contribute to air pollution in the Treasure Valley. However, DEQ's ability to regulate those sources or involve Oregon communities in the Airshed Management Program is limited. Scientific data demonstrating a link between emissions in Oregon and air quality in the Treasure Valley have not been established. During development of the Treasure Valley Airshed Management Program, Idaho DEQ will approach the State of Oregon about forming a cooperative partnership to protect air quality in this region. We will also begin monitoring near the Oregon border to determine effects of pollutant transport from eastern Oregon. Initially, the western boundary of the airshed will be the Idaho-Oregon state line.
- Owyhee County is sparsely populated, with few emissions sources except from agricultural activities. Unless there are source-specific reasons, DEQ proposes that the southern edge of the airshed be located along the Snake River, which creates the southern border of Ada and Canyon Counties.
- A ridge line along the northern edge of Ada and Canyon Counties appears to present a barrier to air flow during the most stagnant conditions. However, DEQ plans to begin outreach and monitoring efforts in Gem and Payette Counties to determine how air pollution levels between these areas and the Treasure Valley are related. These Counties may elect to be included in the Treasure Valley Airshed during the Airshed Management Program development. For now, DEQ will establish the northern boundary of the airshed at the northern Ada and Canyon County borders.

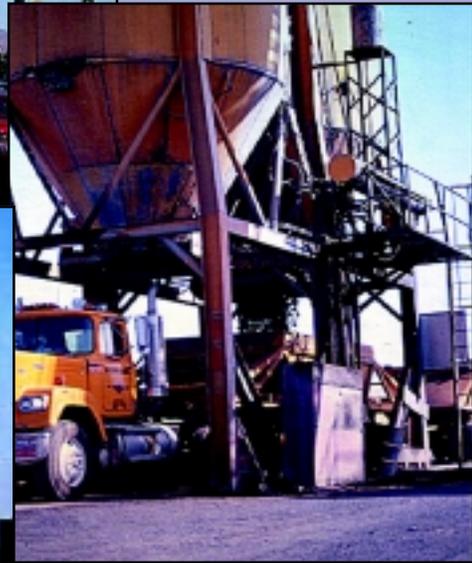


Figure 3. Map of Treasure Valley Airshed

As we embark upon the Airshed Management approach, the initial definition of the Treasure Valley Airshed will be limited to Ada and Canyon Counties. This definition of the management area may be modified during the Program’s development as additional data become available and outreach efforts are expanded.

Section 3

pollutants of concern in the treasure valley airshed



In this section we provide a brief overview of air pollution in the Treasure Valley and some of the evidence that indicates a need for good planning to avoid future problems. It is not intended to be a comprehensive discussion of current or projected air pollution levels. Complete versions of the studies and data are available, and will be fully detailed in the document that will describe the Treasure Valley Airshed Management Program, which is scheduled for completion in 2005.

There are six "criteria" pollutants for which the EPA has established standards to protect the health and welfare of people, plants and animals, as well as to prevent damage to buildings, monuments, water resources, and natural resources. The State of Idaho has also adopted these standards into state rules. These six pollutants are carbon monoxide, ozone,

nitrogen dioxide, lead, particulate matter, and sulfur dioxide. In addition to the six "criteria" pollutants, DEQ and EPA also identify and regulate toxic or hazardous air pollution. Other issues of concern expressed by Treasure Valley residents are reduced visibility/haziness and odor problems.

DEQ has limited resources. Therefore, we prioritize our efforts to manage air pollution in a particular area based on the likelihood that a significant problem exists or could develop. This is guided by what we know about an area through past studies and monitoring data and by specific requirements of EPA based on the population, climate, or industries located within an area. DEQ's experience and the experience of other states, especially in the western United States, give an indication of what types of new problems may develop in Idaho.

Based on our evaluation of potential air pollution problems in the Treasure Valley, the Treasure Valley Airshed Management Program will focus on managing concerns about carbon monoxide, particulate matter, ozone, and toxic air pollutants. Although current air quality measurements taken across the valley show the area meeting state and federal air quality standards, these are the pollutants that we think have the greatest potential to become a public health concern in the next 25 years. Other issues may be identified through scientific studies or through community involvement and the development of the community vision and goals.

particulate matter

Particulate matter is made up of small particles suspended in the air, including dust, smoke, and chemicals. There are two categories of particulate matter. PM_{10} consists of airborne particles that are 10 microns or less in aerodynamic diameter. These small particles can penetrate the deeper regions of the lung, causing a variety of health problems. When PM_{10} particles contain carcinogenic or toxic materials, the health effects can be acute and long-term.

EPA has also begun attempts to regulate $PM_{2.5}$, or particles that are 2.5 microns or smaller. $PM_{2.5}$ particles

are a subset of PM_{10} particles. The particles that make up this smaller size range have been found to be the most damaging type of particulate matter.

particulate matter in the treasure valley

Particulate matter in the Treasure Valley comes from many sources, including agricultural activities, smoke, and dust blown off roadways. Ada County has historically had problems with particulate matter levels. Levels of PM_{10} have been monitored in Ada County since 1986 and the area was designated a PM_{10} nonattainment area in 1987. In the 1980s, DEQ research showed that the primary source of particulate in Ada County was smoke from wood burning. Measures that decreased emissions from residential wood burning have been successful in reducing PM_{10} levels. No exceedances have been measured since January 7, 1991. Monitoring data shows that Ada County's PM_{10} levels have improved over the last decade. DEQ began PM_{10} monitoring in Canyon County in 1993. Levels there closely match those found in Ada County.

DEQ began monitoring $PM_{2.5}$ across the Treasure Valley in 1998, soon after the standard was established. Data from these initial years shows that levels are currently below the limit.

Average Annual PM_{10} Concentrations

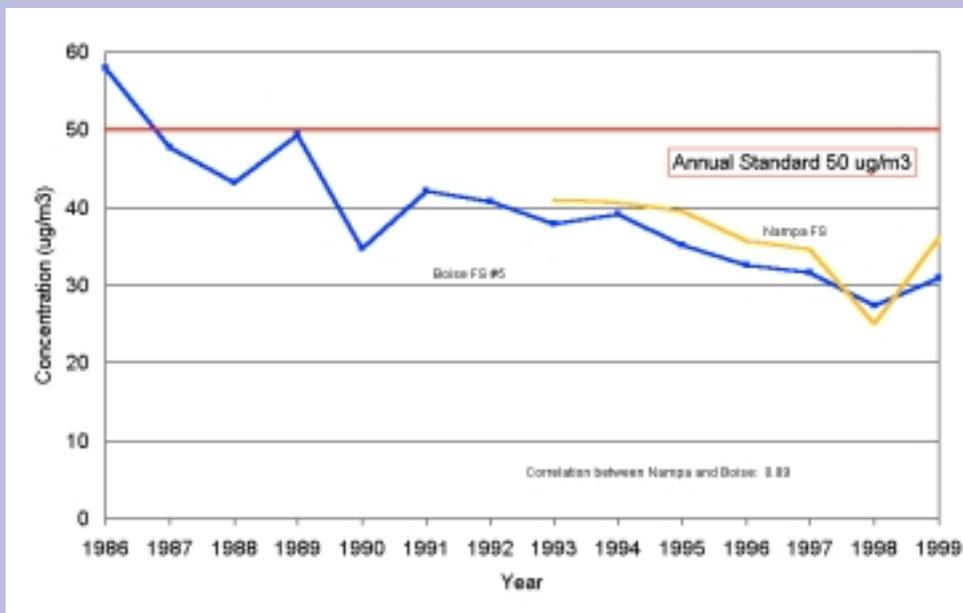


Figure 4. Annual Average PM_{10} concentrations measured in downtown Boise and Nampa demonstrate that PM_{10} concentrations fluctuate uniformly throughout the valley. (Source: DEQ monitoring data)

changes to the particulate matter air quality standards

Determining a safe level of particulate matter has proven to be controversial. The federal particulate matter standards have evolved over time as new scientific studies of health effects have focused on increasingly smaller particles. In 1997 EPA revised the standard for PM_{10} and added a standard for $PM_{2.5}$. Based on a DEQ request, EPA granted Ada County an early transition to the new PM_{10} standards and revoked the Ada County PM_{10} nonattainment designation, effective March 12, 1999.

On May 14, 1999, the First District Court of Appeals remanded the 1997 revised ambient air quality standards for particulate matter to EPA for redrafting. The ruling was a result of a lawsuit by the American Trucking Association and others, contesting the revised air quality standards. The Court ruled that the new $PM_{2.5}$ standards should remain in place, but vacated the revised PM_{10} standards. The pre-existing PM_{10} standards still apply to the rest of the nation, but, in Ada County, EPA had revoked them two months previously, leaving us with no applicable federal PM_{10} standard.

The Idaho Clean Air Force, a local environmental group, filed a petition in the Ninth Circuit Court of Appeals to

review EPA's revocation of the national ambient air quality standard in Ada County and the repeal of Ada County's nonattainment designation. On June 26, 2000, the EPA proposed a ruling to return Ada County to nonattainment status. A settlement was negotiated in January 2001 in which DEQ must submit a Particulate Matter (PM_{10}) Maintenance Plan for Ada County to EPA no later than September 30, 2002. Failure to meet this deadline will result in the area being re-designated as nonattainment for PM_{10} . Developing this Plan in the short time frame allowed will demand a high level of effort.

airshed management approach applied to particulate matter

Monitoring results show that PM_{10} and $PM_{2.5}$ levels fluctuate uniformly throughout the valley, as seen in Figures 4 and 5. Particulate matter pollution that is emitted in one part of the valley may spread out to affect the entire airshed, especially during multi-day stagnation events.

While an exceedance of the air quality standards has not been measured in Canyon County, the presence of PM_{10} levels similar to those measured in Ada County (with its history of air quality violations) indicates

Recent $PM_{2.5}$ Data

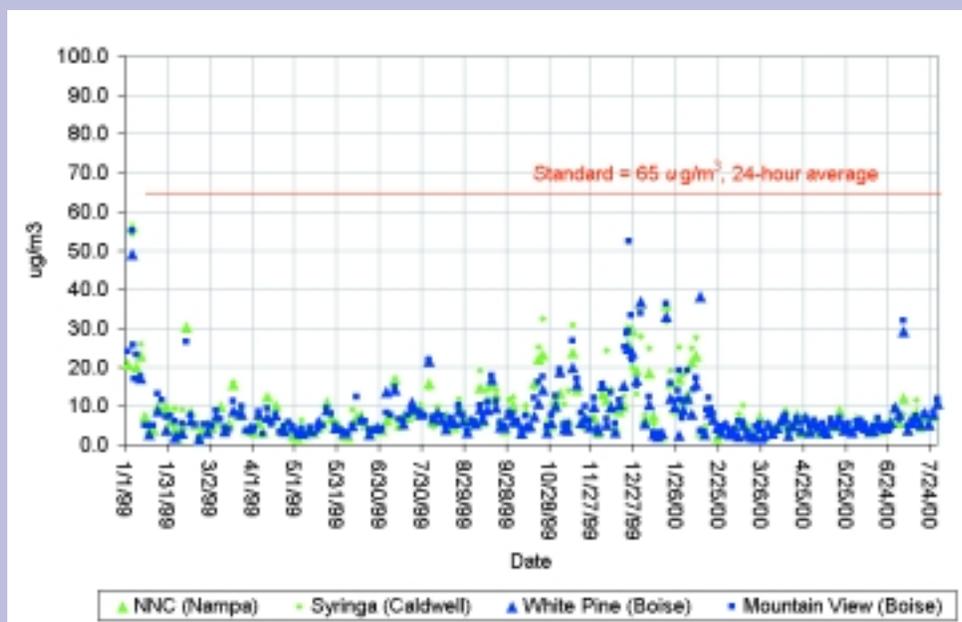


Figure 5. 24-hour $PM_{2.5}$ concentrations measured across the Treasure Valley demonstrate that $PM_{2.5}$ concentrations fluctuate uniformly throughout the valley. (Source: DEQ monitoring data)

	<i>Mountain View Boise</i>	<i>White Pine SE Boise</i>	<i>Nampa</i>
<i>White Pine, SE Boise</i>	<i>0.97</i>		
<i>Nampa</i>	<i>0.95</i>	<i>0.92</i>	
<i>Caldwell</i>	<i>0.87</i>	<i>0.82</i>	<i>0.93</i>

Table 1. Correlation between 1999 24-hour PM_{2.5} concentrations measured across the Treasure Valley. (A value of 1.0 would indicate identical data) (Source: DEQ monitoring data)

further study and preventative measures are appropriate.

PM_{2.5}, the smallest particulate matter, do not settle out of the air quickly. They can remain aloft for extended periods of time, and can be transported long distances. PM_{2.5} concentrations measured at sites across the valley are very similar, decreasing only slightly with distance.

Air quality scientists use computer **modeling** to evaluate potential future air quality. A computer simulation has been performed for the Treasure Valley using regulatory models approved by the EPA. Modeling was conducted using 1995 emissions levels and meteorological conditions that reflect those experienced in 1991, the date of the last significant inversion. The model indicated that there is a potential for an exceedance of the PM₁₀ standards to occur if stagnation conditions develop. Modeling simulations of air quality in the years 2005, 2010 and 2015 indicate a widespread potential for exceedances throughout the valley in the future, even during mild winters. Some of the factors which contribute to the potential for future problems are secondary pollutant formation, dust from roads, population growth and potential increases in industrial air pollution emissions.

The Airshed Management approach will be essential to addressing particulate matter pollution in the Treasure Valley. This is because monitoring and computer modeling indicate particulate matter concentrations in neighboring Canyon County are equal to those in Ada County, and have the same potential to exceed health-based standards. Canyon County is not part of the historical nonattainment area and does not have the same particulate matter control strategies in place. Under the Airshed Management approach, however, Canyon County would participate in joint measures to control particulate matter within the entire airshed.

DEQ plans to conduct several studies to more fully assess potential particulate levels in the future. DEQ will prepare an updated emissions inventory that will count up emissions from all sources in the area and will analyze projected emissions growth through 2020. A study of the formation of secondary pollutants in the area, which will enable us to determine effective controls, was completed in November 2000. We also plan to conduct a study to develop accurate local emissions data regarding the impacts of road dust. Industrial sources that have a large difference between actual emissions and permitted emissions limits will be evaluated to determine if lower permitted emissions limits are appropriate. Some sources, like dust and smoke from agriculture, will also be studied for better understanding of their contribution to the airshed's particulate matter levels.

DEQ will use the improved data from these studies to improve modeling of potential particulate matter concentrations in the future. The results will be used to set a Treasure Valley **emissions budget** for particulate matter. The budget will apply to all sources and will include limits for particulate matter (PM₁₀ and PM_{2.5}), as well as precursors such as nitrogen oxides, sulfur oxides, and ammonia. These studies will be used as elements of a Maintenance Plan and submitted to EPA, as required.

carbon monoxide

Carbon monoxide is a product of incomplete combustion of wood, fossil fuels, and other compounds that contain carbon. Carbon monoxide reduces the ability of the blood to carry oxygen, which is vital to the tissues of the body. Excessive levels of carbon monoxide can affect the cardiovascular and nervous systems.

carbon monoxide in the treasure valley

The primary source of carbon monoxide in the Treasure Valley is motor vehicles, accounting for an estimated 70% of annual emissions, and 77% of winter emissions in 1995.

Carbon monoxide has been monitored in downtown Boise since 1977, and in downtown Nampa since December 1998.

There were numerous violations of the eight-hour carbon monoxide standard in Ada County in the past, which resulted in a carbon monoxide nonattainment designation in 1978. At that time, exceedances of the eight-hour carbon monoxide air quality standards were measured up to 80 days per year, with eight-hour average concentrations reaching as high as two times the allowable amount.

Carbon monoxide levels in Ada County have dropped since the 1970s. The Ada County Vehicle Inspection and Maintenance Program, along with federal emissions standards for new vehicles, have radically decreased carbon monoxide emissions from motor vehicles. Efforts to increase the use of alternative

transportation, as well as improvements in traffic flow in downtown Boise, have reduced congestion and eliminated opportunities for carbon monoxide pollution to build up in hotspot areas. The most recent measurements of a carbon monoxide concentration exceeding the standard were recorded in January 1991.

Because carbon monoxide levels are now well below the standard, DEQ is in the process of developing a Carbon Monoxide Maintenance Plan, the first step toward being re-designated as "attainment" for carbon monoxide. However, as dictated by the Clean Air Act and common sense, planning and good management are still necessary to ensure that carbon monoxide levels stay within a reasonable range. The Carbon Monoxide Maintenance Plan will become a component of the Airshed Management Program.

Periods of high carbon monoxide concentrations appear to be driven by increased emissions, usually due to rush-hour or high traffic periods. Barriers to the movement of air, such as tall buildings in downtown areas, can contribute to the potential for accumulation. Weather patterns can have a limited effect on levels, but are not a primary factor in carbon monoxide accumulation. Long-term stagnant weather patterns,

Boise Carbon Monoxide Eight-Hour Average Concentrations

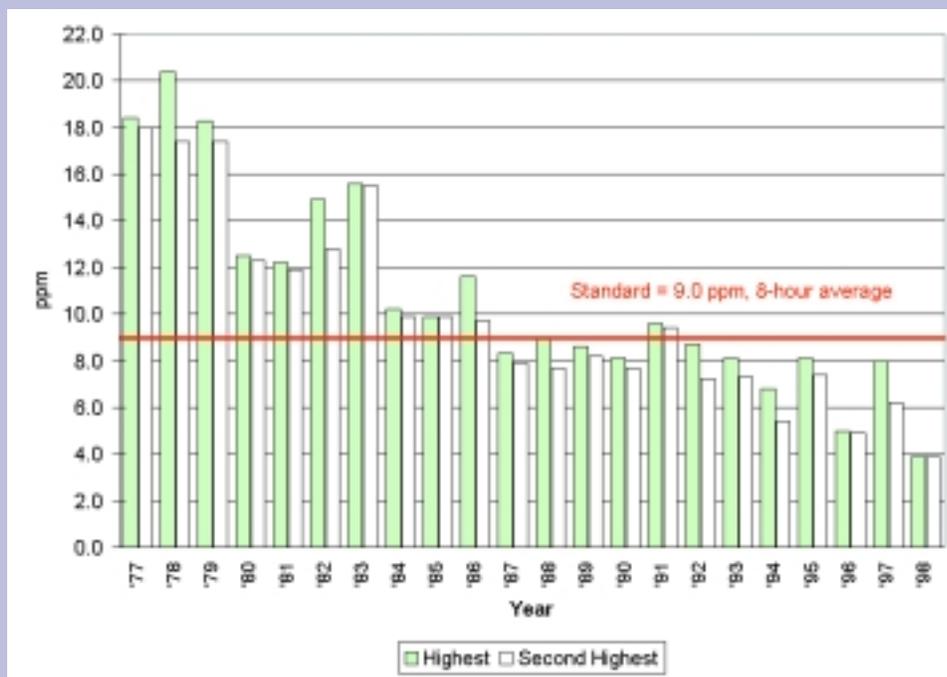


Figure 6. Highest and Second Highest Non-Overlapping Eight-hour Average Carbon Monoxide concentrations measured in downtown Boise. (Source: DEQ monitoring data)

which play a dominant role for other pollutants in the area, do not appear to affect carbon monoxide concentrations significantly. However, the area does experience short-term, low-level afternoon inversions that can contribute to accumulation of carbon monoxide when they coincide with rush hour traffic.

Winter (November through February) is generally when higher carbon monoxide concentrations are measured. This is due to the greater frequency of minor inversions in winter. It may also be influenced by colder ambient temperatures, which can decrease the efficiency of emissions control equipment and combustion, resulting in an increase of carbon monoxide emissions from vehicles.

Airshed Management Approach Applied to Carbon Monoxide

While particulate matter may stay aloft and disperse throughout an airshed, carbon monoxide tends to dissipate more readily. This means that there may be localized differences in carbon monoxide levels, depending on the controls applied and individual situations.

Even so, Airshed Management is the most efficient method to control carbon monoxide pollution. This is because vehicles, the primary source of carbon monoxide, travel between areas, particularly in an interconnected metropolitan area like the Treasure Valley. Controlling emissions from vehicles in only one

portion of the region does not adequately address the issue. Other sources of carbon monoxide, such as open burning, combustion of heating fuels, or lawn and garden equipment, are also widely spread across the area.

Carbon monoxide monitors are required to be located in areas with the highest concentrations, usually a crowded downtown area. Although concentrations are certainly lower in other less congested vicinities, unhealthy levels in any area are unacceptable.

In addition to monitoring, DEQ has prepared an inventory of carbon monoxide sources in both Ada and Canyon Counties, and conducted a **saturation study**, or short term monitoring study at numerous locations, to find locations with the highest carbon monoxide concentrations and potential for human exposure.

Data from the saturation study and recent carbon monoxide monitoring show that carbon monoxide concentrations in Canyon County are often higher than those in Ada County. Concentrations in Canyon County have the potential to impact public health and violate the standards, triggering a nonattainment designation for the entire Treasure Valley. As in Ada County, the dominant source of carbon monoxide air pollution is motor vehicles. Unlike Ada County, Canyon County is not part of the nonattainment area and does not have the same requirements for industries or vehicles.

DEQ has begun to work with Canyon County governing bodies to adopt strategies such as the vehicle emissions testing program and participation in regional planning to reduce motor vehicle-related carbon

Carbon Monoxide Levels Highest Measurement Each Month

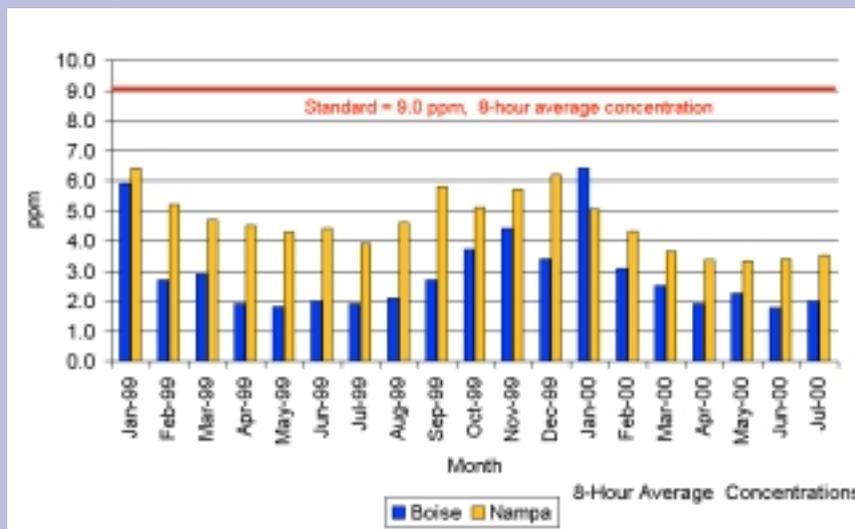


Figure 7. Comparison of Recent Highest Eight-Hour Average Carbon Monoxide Concentrations in Downtown Boise and Nampa (Source: DEQ monitoring data)

monoxide pollution. A consistent vehicle emissions testing program throughout the valley will have an impact on concentrations in Canyon County as well as Ada County, since many people commute between the areas to shop or work. Valley-wide strategies, such as vehicle emissions testing, cleaner vehicles, using cleaner burning oxygenated fuels, or managing vehicle use through alternative modes or highway design, will reduce peak carbon monoxide concentrations in downtown areas and congested areas throughout the region.

other pollutants

ozone

Ozone is an essential and natural part of the upper atmosphere that protects us from the sun's ultraviolet rays. Near the surface of the earth it is unnatural and causes damage. Ozone irritates the mucus membranes of the respiratory system, eyes and other tissues. Prolonged exposure may cause permanent damage to the lungs. It can also reduce the yield of agricultural crops and damage forests or vegetation. Recent health studies have shown ozone to be more detrimental to health than previously thought. In response, EPA proposed more stringent standards for ozone in 1997.

Ozone is not usually emitted directly into the air. It is formed in a chemical reaction between oxygen, volatile organic compounds, and nitrogen oxides in the presence of sunlight. The precursor gases (volatile organic compounds and nitrogen oxides) come from fossil fuel combustion in vehicles, factories, farm equipment or other combustion engines. They can also come from landfills, chemical solvents, and gasoline vapors.

Current ozone levels in the Treasure Valley are unknown, but the precursor gases and weather conditions necessary for ozone formation are present. Federal requirements to monitor ozone are triggered by population levels. If funding is available, DEQ plans to establish a three station ozone monitoring network across the valley by 2002. Each of the three stations will measure ozone levels, as well as nitrogen dioxide, volatile organic compounds and meteorological conditions. Data on these precursor pollutants, in addition to meteorological parameters, will be necessary to develop cost effective pollution management strategies. In keeping with the Airshed Management approach, information on ozone concentrations will be shared with the community.

As with all DEQ monitoring stations, the equipment will be located according to EPA requirements. Local communities will be informed of DEQ's monitoring plans when the equipment is installed. DEQ also

releases a Monitoring Network Review for public comment each summer that details monitoring plans for the upcoming year.

nitrogen and sulfur oxides

Nitrogen oxides are formed when fossil fuels are burned at high temperatures. In this area, the largest source is motor vehicles. Monitoring data, collected in Boise since 1996, show that levels of nitrogen dioxide and other oxides of nitrogen are low. DEQ will continue to monitor this pollutant, and plans to expand the nitrogen oxides monitoring network as a part of ozone monitoring.

Sulfur dioxide emissions in the area are assumed to be low because there are few sources. Sulfur oxides are the result of combustion of fuels containing sulfur, such as coal or diesel. Gasoline also contains a small amount of sulfur, although only 1% of SO_x emitted annually in this area is estimated to result from vehicles. Industrial coal burning is the dominant source of sulfur oxides in the Treasure Valley. DEQ has no plans to begin to monitor this pollutant unless new information indicates that levels could be of concern.

While existing levels of nitrogen dioxide and sulfur dioxide are not a direct health concern, they can contribute to other problems. Both nitrogen oxides and sulfur oxides can react with ammonia to form secondary particulate matter that is small enough to fall into the most damaging size category, $PM_{2.5}$. Both NO_x and SO_x can also combine with other elements to create acid rain, and, as discussed above, nitrogen oxides are an ingredient in the formation of ozone.

lead

Airborne lead is no longer a problem in most of the United States, including Idaho. In the past, vehicle fuel was a major source of lead in the air, but with the advent of unleaded fuels most areas no longer experience problems with airborne lead. Violations now occur only in the vicinity of major sources such as smelters or battery manufacturers, which do not exist in the Treasure Valley area. DEQ has no plans to monitor lead.

hazardous air pollutants

EPA has set standards for the six criteria pollutants that limit the amount of each pollutant that can be in the air at any time. In addition to the six criteria pollutants, EPA also regulates 188 toxic or hazardous air pollutants by limiting the amount of each that can be emitted from any one source.

EPA's recent nationwide Cumulative Exposure Project

and the 1986 Integrated Air Cancer Project Site Source Inventory for Boise show a higher than average risk from toxic air pollution in this area. Toxic air pollutants come from a variety of sources, including gasoline, chemical processing, dry cleaning and manufacturing. The Integrated Air Cancer Study specifically identified transportation sources as the single greatest contributor to excess cancer risk locally. Hazardous or carcinogenic substances emitted by motor vehicles include benzene, formaldehyde, acetaldehyde, and 1-3-butadiene.

In the absence of any standards limiting the amounts that can be in the air, regulation has focused on limiting emissions from large industrial sources. DEQ is currently identifying and inventorying the sources and amounts of hazardous air pollution emitted in Idaho. These inventories will provide us with information about which substances should be monitored locally to evaluate public exposure and health risks.

visibility

Many areas of the western United States are concerned about reduced visibility. Haze can be the result of many factors, including moisture in the air. Smog and particulates are the main types of pollution that reduce visibility. Even a relatively small increase in pollution may drastically reduce visibility.

Regional haze itself does not impair health, although the pollutant causing it may. However, there are indirect economic impacts associated with haze. In a 1997 Air Quality Public Opinion Survey, 43% of Treasure Valley residents thought visibility or haze was the most obvious indicator of air pollution. Areas that maintain an image of a healthy, clean place to live attract more businesses, particularly large corporations that are expanding or relocating. In addition, the scenic image of Idaho is essential to tourism and travel, which represents the third largest industry in Idaho.

The Clean Air Act requires visibility protection for National Parks and Wilderness Areas, but there are no guidelines for other areas. A cornerstone of the Airshed Management Program will be collaborative development of a community vision and goals for the future of the Treasure Valley's air quality. Even though there are no federal or state standards for visibility, if a goal for visibility is established, DEQ will work with local entities to achieve that objective.

odors

Unpleasant odors often result from substances that do not present a health hazard. For this reason, DEQ's regulatory authority regarding many odors is limited. However, in late 2000, DEQ established new procedures to guide our response to odor complaints, which should

provide a framework to ensure that odor issues are handled in a responsive, timely manner. Like visibility, if the community indicates that odor control continues to be an important issue, DEQ will work with local entities to develop solutions to the problem.

Section 4

elements of airshed management: scientific understanding



Decisions about managing air quality must be made based on good scientific understanding of the airshed and the pollutants in it. This will ensure that strategies designed to meet community goals will be effective.

Science is not a static process; new information and techniques are constantly being added to our pool of resources. As our scientific understanding evolves and improves, we will incorporate our new understanding into the Airshed Management Program. However, waiting until the scientific studies are “complete” is not realistic. Our data gives evidence of potential challenges now and in the future. We will begin to address these issues at the same time that we work to improve our scientific understanding.

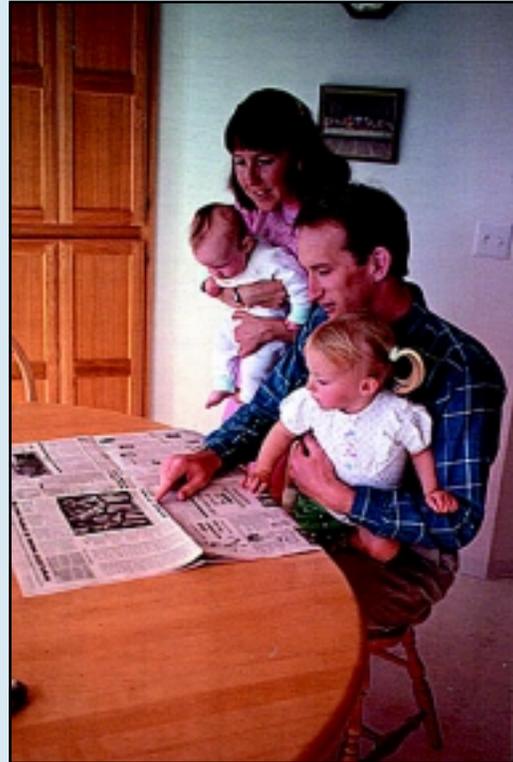
DEQ has already identified several studies and projects that will improve our understanding of local conditions. These studies include the development of a precise definition of Treasure Valley Airshed Management

area, a complete study of local conditions and factors affecting development and impact of secondary aerosols (PM), and a study to develop local emission factors for road dust (PM). DEQ also plans to perform some modifications to existing modeling and emissions inventories that will make them more accurate and better planning tools.

As with other technical work conducted in the past, all DEQ scientific work will undergo review by outside technical experts to ensure that methods and results are valid. Instead of convening a separate technical work group for each specific study as in the past, DEQ has established a long-term Technical Review Committee to provide ongoing input on the range of air quality scientific work. The Technical Review Committee is made up of members of the scientific community and others who have technical expertise and scientific background. As always, DEQ's work will be available for public review and comment as well.

Section 5

elements of airshed management: community involvement



The foundation of Airshed Management is community involvement and community-directed initiatives to protect air quality. If the people of the Treasure Valley, its elected officials, and businesses take a proactive stance on air quality, then the region can resolve issues before a serious problem develops that could harm public health and would require DEQ to resume a regulatory, reactive approach.

Effective, proactive management of air quality requires that DEQ work with other agencies and local governments to minimize all sources of air pollution. Working from scientific data, DEQ can recommend strategies that communities can use to address or avoid air pollution issues. DEQ can work to provide cost-benefit analyses of implementing proactive strategies. But it will be up to local communities to implement many of those recommendations.

community vision and goals for the air we breathe

One of the first steps for establishing an Airshed Management Program must be the development of a long-range (20 to 25 year) vision of what the Treasure Valley's air quality should be like in the future. This vision will be based on community involvement and initiative.

The Treasure Valley Airshed Advisory Group (described in more detail below) will act as a steering committee for developing a community vision and set of goals for air quality. Extensive public outreach will be used to gather community input. We anticipate that the vision and goals will be finalized in 2003.

The next step will be measuring progress toward achieving community goals. DEQ will collaborate with the Airshed Advisory Group and the public to develop a framework for tracking progress toward the air quality goals established by the vision. A set of indicators will be developed. An example of an indicator might be the number of days each year when the Owyhees are easily visible from a specific location, or the number of days each year when air quality falls into the "good" category, based on EPA's Air Quality Index. DEQ will establish a schedule for informing the community on the status of each indicator and progress toward the community vision.

avenues of community involvement

It is important for the public, businesses, and local governments to understand air quality issues so that a community-wide consensus can be developed. In response to public requests, DEQ has initiated several efforts to increase education, access to information, and participation in air quality management. This section describes the specific strategies that DEQ plans to employ to encourage community involvement in air quality. Our primary focus has been on publicizing air quality information through meetings, and establishing a Treasure Valley Airshed Advisory Group, a Multi-Agency Air Quality Group, and other partnerships to facilitate working on airshed management on a long term basis.

During the revocation of Northern Ada County's PM₁₀ nonattainment status, the public began to express concern about local air quality. In the spring of 1999 a public meeting was held to discuss how DEQ could enhance communication about air quality issues and facilitate community participation. The meeting was

attended by more than 90 people. Many suggestions were received at that meeting. From those suggestions, a list of action items was developed. DEQ is implementing the action items as resources permit.

public meetings

One of the top priorities expressed by the community was more opportunity to learn what was going on at DEQ. To address this priority, DEQ began holding a series of open informational meetings to educate the public on local air quality issues and to allow open dialogue with DEQ. These meetings are held during evening hours at various locations across the valley to provide better access for community members. Each meeting provides a presentation on a specific current topic, followed by a general question and answer session. An effort is made to simplify technical information and language, while still explaining the complexity of the issues. DEQ plans to hold four to six of these meetings each year.

These public meetings will provide a forum for developing a community air quality vision and for discussing how to implement Airshed Management in the Treasure Valley.

daily air quality information

In previous years, DEQ operated a phone hotline during winter months where people could get recorded information about daily air pollution levels in the Boise area. In response to the public's increased desire for air quality information, DEQ expanded this program to operate year round and to include data collected from across the Treasure Valley. Daily air pollution concentrations and a forecast for future conditions are now posted on the Internet, as well as reported on a telephone hotline. Currently, carbon monoxide, PM₁₀, and PM_{2.5} levels are reported daily, based on measurements taken in Boise and Nampa. As the monitoring network expands, more information will be added.

web site

For greater access to DEQ information, a web site was one of the community's top priorities. The web site allows the community direct access to information on air quality and on opportunities to become involved in DEQ's regulatory work. This allows the community more influence on decisions about the management of the Treasure Valley airshed.

The Idaho Department of Environmental Quality has established a statewide web site where browsers can access information regarding statewide and local issues. Air quality information is located at www.deq.state.id.us/air/air1.htm, and contains

the following:

- Daily reports on air quality from various sites across the state, including the Treasure Valley
- A description of the EPA's Air Quality Index, upon which the air quality reports are based
- Access to a calendar that lists events and deadlines
- A listing of the latest news releases, special alerts, and bulletins
- A description of different types of air pollution, their effects on health, where they come from, how they are measured, and what the federal standards are
- Tips for reducing air pollution
- Access to the Boise Regional Office Air page containing information specific to the Treasure Valley, including:
 - A list of documents and studies pertaining to air quality in the Treasure Valley
 - "Treasure Valley Air Quality," a summary of the status of air quality in our region, an overview of the major air pollutants, description of the measures that have been taken to improve air quality, and explanation of some of the upcoming challenges
- Information on public comment periods for various permits
- Information on DEQ air protection activities and policies
- Forms and information for obtaining permits for industrial facilities
- Small business assistance to guide companies through the many air quality rules and regulations
- Idaho air pollution rules and regulations and information on proposed rule changes

We are continuing to develop and expand the air quality information available on the web site. Future plans call for adding:

- Information about the Treasure Valley Airshed Management Program
- A map and information about the air quality monitoring sites across the state
- A description of how weather affects air quality in the Treasure Valley
- A link to the EPA's database of air pollution measurements for the entire United States, including local monitoring data
- Explanations of some of the control strategies employed locally, including the vehicle emissions

testing program and burn bans

- A description of DEQ programs and groups to help individuals become more informed about air quality management

publications

DEQ prepares a number of reports, including an annual State of the Environment Report and Strategic Plan. We also develop public information brochures and documents. Some recent examples include this document, "Treasure Valley Air Quality," and brochures on the Daily Air Quality Report. We will continue to prepare this type of information when a need is identified by DEQ or one of our community partners.

To support Airshed Management, DEQ plans to develop an annual report to the public that contains air quality trends, and reports on progress toward achieving the community's vision and goals for air quality. We plan to begin publishing this report in 2003, once the community goals for air quality have been established.

geographic information systems display tools

DEQ plans to develop a Geographic Information System (GIS) database to support air quality planning efforts and to provide more effective information display. GIS technology will allow us to display emissions levels, predicted concentrations, and other information over a map of the area. These pictorial representations of data are intended to facilitate discussion and analysis of existing situations. It will also allow us to compare possible future scenarios, for example, the effects of different weather conditions or the impacts of different air quality protection strategies.

treasure valley airshed advisory group

DEQ formed an Airshed Advisory Group in November 1999. The purpose of the Airshed Advisory Group is to provide a forum where representatives of a cross section of various interests can learn about air quality issues in the Treasure Valley, find out how DEQ is addressing the issues, and provide input and feedback to DEQ.

Initially, DEQ selected Advisory Group members from a list of applicants. DEQ was careful to include a balanced mix of interests from across the airshed. Now that the group is in operation, changes or additions to group membership are made by group consensus. Group members are asked to participate for a minimum of one year in order to become fully versed in air

<i>Name</i>	<i>Affiliation</i>
• John Ashby	Ada County Citizen
• Esther Ceja	Hispanic Community
• Dean DeLorey	Industry: Amalgamated Sugar
• Lila Fladwood	Health: American Lung Association
• Brad Harr	NW Environmental Business Council
• Anne Hausrath	Community Group: Idaho SmartGrowth
• Victor Hill	Meteorologist
• Arnold Howard	Health: Southwest District Health
• Bob Kiernan	Canyon County Citizen
• Krista McIntyre	Industry: Stoel Rives
• Dr. Mark Mering	Medical Community
• Gary Richardson	Community Group: Idaho Clean Air Force
• Rich Rusnak	Medical Community
• John Weber	Small Business: Automotive

Table 2. Treasure Valley Airshed Advisory Group Membership (1999-2000)

quality issues. As of the end of 2000, the Advisory Group had about thirteen members, including citizens of Ada and Canyon County, representatives of community groups, public health and business interests.

The Treasure Valley Airshed Advisory Group will have a lead role in facilitating the development of a community vision and goals for air quality. They have already provided invaluable assistance by providing input on the development of this document, and will also help us gather input on the Treasure Valley Airshed Management Program from their associations, affiliations and other contacts.

multi-agency air quality group

Both the Airshed Advisory Group and initial community input indicated a need for more interaction and cooperation between the various agencies involved with or impacted by air quality management. The agencies involved with aspects of air quality are numerous. They include transportation agencies, public health agencies, city and county governments, EPA, agricultural agencies, and land management agencies.

Although interagency groups had been organized in the past, these were devoted to special topics or to the development of specific Plans. To support the Airshed Management approach, DEQ has organized a Multi-Agency Air Quality Group to meet quarterly and

discuss air quality issues on an ongoing basis. This Group focuses broadly on airshed management issues. As special issues come up, subcommittees will be established. The Multi-Agency Air Quality Group is charged with ensuring coordination on publicly funded projects and efforts related to air quality.

recognition programs

Establishing recognition programs for communities and facilities that go beyond regulatory requirements is one way to develop partnerships that will help protect air quality. DEQ will investigate the support for establishing recognition programs in the Treasure Valley.

partnerships with local governments and agencies

DEQ also continues to work with elected and appointed local government officials to provide them with information and gather input about the Airshed Management approach. DEQ invests staff resources into making presentations and meeting with representatives from local governments. The objective of these meetings is to explain what proactive, voluntary steps can be taken to protect air quality and why these measures will benefit their community. DEQ also seeks input from local government on what Airshed Management should entail.

Agencies

- **Ada County Development Services**
- **Ada County Highway District**
- **Air Quality Board**
- **Assn. of General Contractors**
- **Bureau of Land Management**
- **Bureau of Environmental Health and Safety**
- **Canyon County Development Services**
- **Canyon County Highway District**
- **Central District Health Department**
- **City of Boise Public Works**
- **City of Caldwell**
- **City of Eagle**
- **City of Garden City**
- **City of Kuna**
- **City of Meridian**
- **City of Nampa**
- **Community Planning Association**
- **Department of Commerce**
- **Division of Health**
- **Environmental Protection Agency**
- **Federal Highway Administration**
- **Golden Gate Highway District**
- **Idaho Dept. of Water Resources**
- **Idaho Transportation Department (3 members)**
- **Local Highway Technical Assistance Council**
- **Nampa Fire Department**
- **Nampa Highway District**
- **Notus - Parma Highway District**
- **Southwest District Health Department**
- **United States Forest Service (Department of Agriculture)**

Table 3. Multi-Agency Air Quality Group Membership (1999-2000)

The response from local government has been good. The Treasure Valley Partnership (a consortium of local governments) supports a cooperative approach to improving air quality in the Treasure Valley and participates in an ongoing dialogue with DEQ. The expansion of the Community Planning Association (COMPASS) to include both Ada and Canyon Counties will facilitate the development of land use and transportation solutions that minimize impacts on air quality.

The Treasure Valley Airshed Management Program, the community vision and goals for air quality, and other components of the Program will be developed in consultation with elected and appointed officials representing local government in the Treasure Valley.

Section 6

elements of airshed management: DEQ strategies to protect air quality



DEQ policies and regulations

Although the primary focus of the Airshed Management strategy is cooperative planning, there will be some aspects of the program that will rely on regulations. In some cases, specific rules or policies may need to be modified to support the airshed management program.

DEQ has historically focused its management of pollution sources on industrial regulation, as required by the Clean Air Act⁵. Since 1994, DEQ has also evaluated transportation impacts on air quality under the **transportation conformity requirements** of the Clean Air Act. DEQ also enforces restrictions on fugitive dust⁶ and open burning⁷.

As part of the development of the Treasure Valley Airshed Management Program, DEQ will review its policies and regulations to address inconsistencies. For industrial sources, DEQ intends to develop programs or policies to treat all sources equitably across each airshed, including older, “grandfathered” sources and sources of fugitive emissions, precursor pollutants, or condensable particulate matter.

Some of our current policies do not treat sources consistently throughout the airshed. For example, the permits issued to industrial sources in the Ada County PM₁₀ nonattainment area have held these facilities to lower PM₁₀ **fenceline impacts** than sources in neighboring Canyon County. However, particulate matter emissions from any part of the airshed tend to remain aloft, affecting pollution levels across the region, placing an unfair burden on Ada County facilities.

Motor vehicles are a primary source of several types of air pollution, and DEQ believes that a greater emphasis must be placed on addressing transportation impacts. Currently, Conformity Requirements of the Clean Air Act dictate that all federally funded transportation plans, programs, and projects within Ada County must be able to demonstrate that they do not contribute to air quality problems. Given that Canyon County transportation projects have the same potential to impact air quality in the Treasure Valley airshed, DEQ feels strongly that Canyon County transportation plans must also be evaluated to determine the impact. We have requested that all transportation plans within Canyon County be submitted to DEQ for a review of their impacts to air quality.

In addition to industries and motor vehicles, there are many other sources in the Treasure Valley that contribute pollution to the airshed. Airshed Management will require that all sources of pollution be included in strategies to protect air quality. This means including sources that have traditionally not been asked to participate in air quality protection, such as agriculture, forest and range burners, and sources that emit precursor pollutants such as ammonia or nitrogen oxides.

Regulating these sources may require DEQ to develop new policies or regulations, some of which might require legislative authorization. As these new regulations are proposed, DEQ will attempt to provide an economic analysis of the impacts of implementation.

emissions budgets

One of the primary new policies DEQ anticipates establishing is an **emissions budget**. An emissions budget will set a limit or cap on the total amount of a specific type of pollution that may be produced in the Treasure Valley airshed. The emissions budget must account for every source of pollution, including both larger sources, such as industries and transportation sources, and smaller sources like wood stoves, lawn mowers, or small businesses.

There are several steps necessary to establish such a budget. First, DEQ will calculate the amount of air pollution generated in the area currently, as well as projections for future emissions in a study called an **emissions inventory**. Emission inventories must be updated on a periodic basis to ensure that they reflect existing conditions and the most updated growth projections.

Data from the emissions inventory, along with air pollution levels determined from monitoring and scientific studies all become part of a database used in a computer **model** to show potential air pollution concentrations across the region. The model will be carefully calibrated to ensure accuracy by comparing model results to actual measured conditions in the Treasure Valley.

Once the data are collected and the model is calibrated, computer modeling under different weather scenarios will be conducted to determine if current or predicted future levels of emissions have the potential to cause harmful levels of air pollution. If modeling indicates a potential problem, the results are analyzed closely. Through an iterative process, a safe level of emissions will be calculated. Through agency rule, this emissions level will be established as an emissions budget for the area.

Next, the emissions budget will be allocated to the various sources in the valley. This will be done based on input from affected sources, the Technical Review Committee, and the community. To facilitate discussions about allocation of the air resource, DEQ plans to develop a user-friendly GIS display to show modeling results and related databases.

The State will manage air pollution sources in the valley to make certain that emissions stay below the specified emissions budget. This will require periodic updates of the emissions inventory, continued meteorological and air quality monitoring, and regular annual or biennial air quality modeling to ensure that air pollution increases are being managed and that no new problems have developed.

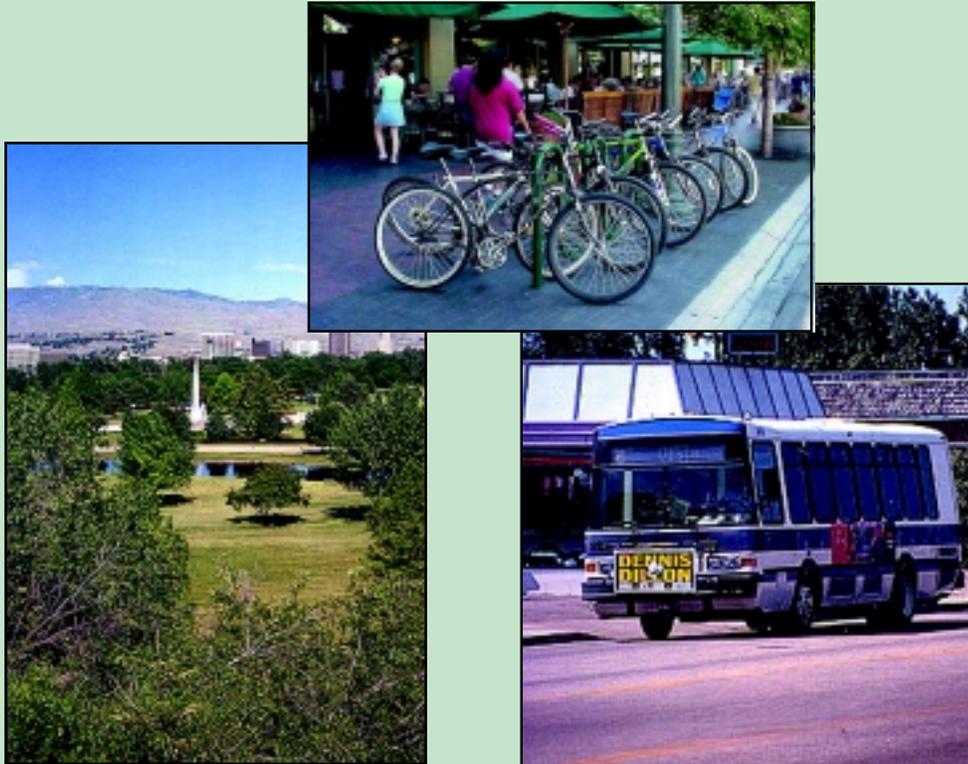
If total emissions within the airshed reach the budget cap, any future growth must be offset by a corresponding reduction in existing emissions. DEQ will ensure that emissions are limited to a safe level in several ways. This will include issuing permits to industrial sources and evaluating the impact of transportation plans and roadway expansion through **transportation impact analyses**.

DEQ also plans to develop an emissions trading program to allow trading of emissions among different sources. **Emissions trading programs** can help make pollution management more cost-effective by allowing sources that have the least expensive control strategies to be compensated for taking up some of the burden for sources that are expensive to control or that already tightly control their emissions.

Establishment of an air pollution emissions budget and trading program may be the most controversial component of this proposed airshed management approach. DEQ has experience with a similar program for managing water quality, in which an effluent trading system was developed to manage pollution going into the Lower Boise River. This EPA-funded demonstration project cost approximately one million dollars.

Negotiating a workable air emissions budget and trading program with all of the potentially affected parties could incur significant costs. There are both legal and political hurdles that will need to be addressed. Legislative endorsement and support will be necessary if an effective system is to be developed.

elements of airshed management: Section 7 community strategies to protect air quality



Based on good scientific analysis, strategies to protect air quality and meet community goals will be developed. This will include community-based strategies in addition to changes in DEQ regulations and policies.

Coordinated planning efforts to manage the region's continued growth have already begun through COMPASS (the local Metropolitan Planning Organization) and transportation planning efforts. As the area grows, it is essential that air quality planning also be coordinated across the valley.

Consistent regulation across the valley will be essential for the success of airshed management. A piecemeal approach to air quality management makes regulations confusing to the public and businesses. It will be very important that local governments work together to develop policies and ordinances designed to protect air quality that are consistent across the airshed. DEQ can assist the process by providing examples or proposed language for local ordinances and technical support.

Keeping air quality as a topic for community discussion is also vital. Local governments can work with DEQ to participate in the development of community goals and vision for air quality. Local government participation in the public meetings and the Multi-Agency Air Quality Group is also important.

The Treasure Valley Partnership, an association of local elected officials, and COMPASS are two organizations identified by DEQ as key partners who can work in cooperation with DEQ and the public to develop community-based strategies for protecting air quality. Both organizations have expressed their willingness to develop flexible, proactive strategies. These locally-based solutions will be incorporated into the Airshed Management Program to demonstrate innovative approaches for ongoing air pollution management.

transportation and community planning

Up-front community planning can be a valuable key to avoiding air quality problems. Pollution from motor vehicles is an especially significant issue for air quality planning, since vehicles are a major source of several types of air pollution and because vehicle use in the region is increasing. Studies show that the number of miles driven in the area has increased faster than population, as people have to drive more often and for longer distances to get where they are going.

Community design and land use planning can have a large effect on reliance on motor vehicles, and can affect the impacts of motor vehicle emissions. Many western communities are designed in a way that essentially requires the use of a motor vehicle to accomplish everyday tasks. These sprawling communities do not allow easy integration of a public transportation system, and make the use of alternatives such as bicycles or carpooling very difficult. Zoning regulations that promote a compact, mixed-use community with necessary services accessible within a “walkable” neighborhood can reduce reliance on motor vehicles. This would not only reduce air pollution, but this type of neighborhood design helps build a sense of community, which could result in many additional benefits.

Community planning to reduce motor vehicle use can lower tailpipe emissions and also impact **fugitive road dust**, a significant portion of particulate matter emissions in the area. It is caused when dirt and sand on roadways is ground up by vehicle tires, and then blown into the air. These fine particles can remain in the air for long periods of time and become distributed throughout the airshed. While street sweeping and other measures can have a beneficial result, fugitive road dust can only be effectively addressed through transportation planning that reduces the vehicle miles traveled in an area.

Communities can incorporate air quality goals and objectives into their comprehensive plans through land use or design guidelines. For example, compact development, sidewalks and streetlights encourage the use of alternative transportation. Development may be designed around an integrated public transportation hub. These land use guidelines promote clean air by decreasing motor vehicle emissions. DEQ will study what has been done in other communities across the country to include air quality goals and objectives in comprehensive plans and will provide that information to local communities.

There are several initiatives already underway in the Treasure Valley that will contribute to the community planning aspect of Airshed Management. Several of

these are private developments that embrace compact, mixed use neighborhood design. Also, using a grant from the Federal Highway Administration, Treasure Valley Futures is conducting a study to explore how new development or redevelopment might occur in a way that improves the efficiency of the transportation system and reduces the impacts of transportation on the environment.

recommended community measures

Even as the details of the Airshed Management Program are being worked out, there are some measures that would be appropriate under any management strategy. Reduction of emissions is easier to achieve for some sources than for others. DEQ is pursuing controls of these “easier” sources first, and has recommended that they be employed valley-wide.

open burning

Because there are safer alternatives to dispose of debris, an open burning ordinance is one of the first valley-wide measures that DEQ has encouraged. Proposed language for such an ordinance has been provided to local elected officials. Several communities are looking into adapting existing open burning ordinances or establishing new ones to address this issue. Progress is already being made. In 2000 the City of Nampa and the City of Caldwell both enacted open burning ordinances which closely mirror recommended language developed by DEQ.

vehicle emissions testing

Measures such as cleaner federal standards for new cars have made dramatic reductions in tailpipe emissions. However, even new cars can emit excessive amounts of pollution that can be fixed with minor adjustments. Emissions testing in Ada County has had a large impact on pollution levels within that County. Based on the amount of vehicle travel between Ada and Canyon Counties, and on monitoring data that shows carbon monoxide concentrations to be consistently higher in Nampa than in Boise, DEQ has recommended that vehicle emissions testing be expanded to include the entire airshed. The program currently operating in Ada County has proven to be successful, easy to operate, and requires drivers to devote only a few minutes each year to comply. This program costs less than \$15 per vehicle, and could easily be adapted to cover the entire region.

wood smoke

A residential wood smoke control program to reduce smoke impacts during stagnation events would reduce the accumulation of particulate matter during critical days. Again, Ada County's program is effective and could be expanded.

fugitive dust

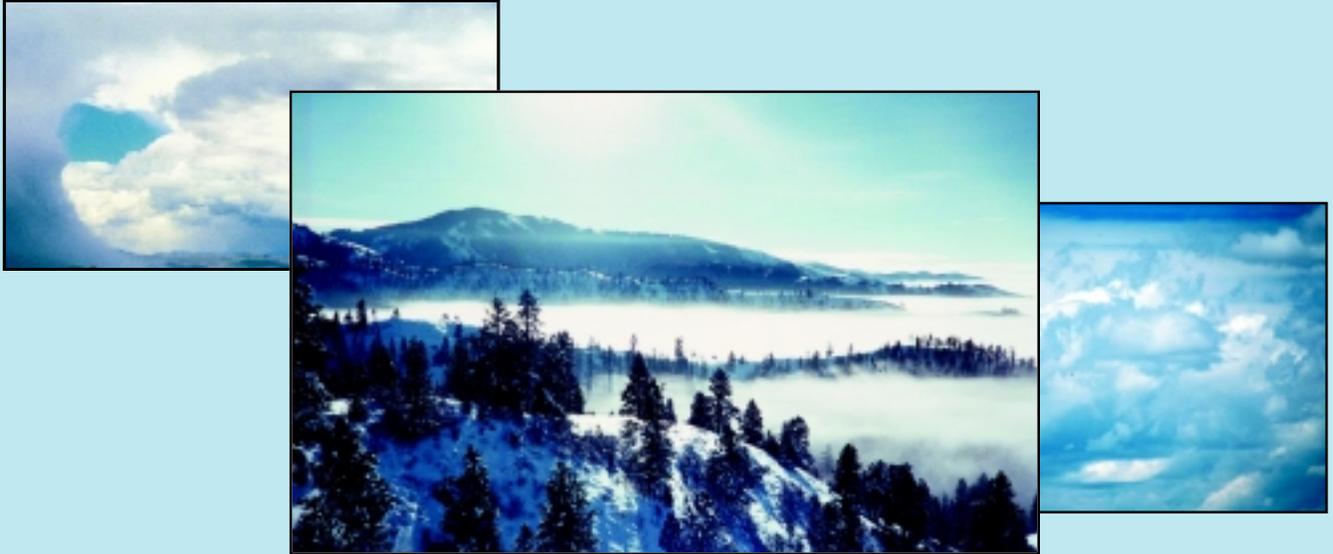
DEQ has also recommended some measures to reduce fugitive dust, such as an ordinance to control dust generated at construction sites and other activity areas, and working to pave dirt roads within the valley. The City of Boise is finalizing a construction site erosion ordinance that contains an air quality portion. Proposed language for a general dust control ordinance has been provided to local elected officials.

alternative fuel vehicles

Along with good land use planning and emissions testing, support of alternative fuel vehicles could reduce the impact of ever-increasing vehicle use. Alternative fuel vehicles run on natural gas, electricity, fuel cells, or other alternatives to gasoline. Cities and government agencies could commit to purchasing alternative fuel vehicles for their own vehicle fleets. Incentives or requirements for alternative fuel vehicles could be established for businesses with large vehicle fleets. There could also be incentives or requirements for a minimum of the vehicles sold in the area be alternative fuel vehicles.

Section 8

development of the treasure valley airshed management program



DEQ plans to have all elements of the Treasure Valley Airshed Program complete by 2005. Development of the Program will require an intensive investment of agency and community resources. It is expected to result in the need for local ordinances and modified or new state regulations. Development of this Program will require efforts in four main areas:

- Scientific Studies
- Community Air Quality Vision and Goals
- DEQ Measures to Protect Air Quality
- Community Measures to Protect Air Quality

Sections 3 and 4 give a brief description of the pollutants of concern and explain some of the studies needed to better understand local conditions.

Section 5 describes how a community vision and goals for the air we breathe will be developed and used as a basis for future planning.

Sections 6 and 7 describe how community and DEQ measures to protect air quality will be developed based on scientific understanding of local air pollution issues and will be designed to ensure that community air quality goals are reached.

The Airshed Management Program will be summarized in a document that will detail all of the components of a Program designed to protect air quality for a 25 year

horizon. The document will include the community vision and goals, legal authorities that allow for the Program, an overview of the priority issues, a description of scientific tools that were used, details on scientific analyses, an emissions budget that applies to all source categories, and other DEQ and community protection strategies.

The activities necessary to develop an Airshed Management Program are extensive. A summary of, and schedule for, the preliminary activities and development of the Airshed Management Program are listed in Table 4. This schedule assumes resources necessary to conduct the studies will be available and that there will be public and legislative support for the Program development.

DEQ believes that applying the Airshed Management approach will allow Idaho to realize its goal of clean, breathable air into the future. It will also allow us to manage our environmental resources without federally imposed restrictions. We are committed to working with Idaho's citizens and businesses to develop and implement this innovative approach in the Treasure Valley and other parts of the State.

We invite you to join with DEQ to make this goal of clean air a reality. It cannot succeed without your support.

2000

Community Outreach	<ul style="list-style-type: none"> • Hold 4 to 6 Public Meetings • Establish Airshed Advisory Group • Establish Technical Review Committee • Establish Multi-Agency Group • Enhance web site with additional information • Prepare document to describe the process for developing the Treasure Valley Airshed Management Program and gather input from community • Provide Annual Monitoring Network Review for public comment
Scientific Studies	<ul style="list-style-type: none"> • Develop initial definition of Treasure Valley Airshed Management area • Complete study of local conditions and factors affecting secondary aerosols (PM) • Begin to refine PM₁₀ modeling and determine additional controls necessary to demonstrate compliance with PM₁₀ standard • Begin statewide survey of sources of carcinogenic or toxic air pollutants
DEQ Air Quality Protection Strategies	<ul style="list-style-type: none"> • Begin work to establish Memorandum of Understanding with transportation agencies to define transportation impact analysis • Begin work to refine strategies for addressing potential exceedences of PM₁₀ standard (based on modeling) • Complete CO Maintenance Plan • Participate in forest and range smoke management program • Develop new guidelines for responding to odor complaints • Review analyses of air quality impacts of transportation plans and projects • Begin work to develop new policy/rules to treat all industrial sources in airshed consistently • Begin work to issue operating permits to set reasonable emissions limitations on all facilities impacting former PM₁₀ nonattainment area
Community Air Quality Protection Strategies	<ul style="list-style-type: none"> • Implement planned improvements to vehicle testing program in Ada County • Analyze impacts of development and land use policies via Treasure Valley Futures project • Analyze transportation plans and projects for impact on air quality

Table 4. Target activities for the development of the Treasure Valley Airshed Management Program by 2005. **(All items for 2000 have been completed.)**

2001

Community Outreach

- Continue to gather input from community with public meetings, Airshed Advisory Group, Multi-Agency Group approach
- Hold 4 to 6 Public Meetings
- Continue to enhance web site
- Develop a community vision for air quality, goals, and indicators to track progress toward community vision
- Begin development of a GIS tool for displaying modeling results
- Conduct Air Quality Public Opinion survey and public awareness campaign for input into community vision for air quality
- Provide Annual Monitoring Network Review for public comment

Scientific Studies

- Prioritize human health risk and monitoring needs based on statewide survey of carcinogenic or toxic air pollutants (**HAP**)
- Continue work to refine PM_{10} modeling and determine additional controls necessary to demonstrate compliance with PM_{10} standards
- Determine methods to estimate motor vehicle emissions and establish motor vehicle emissions budgets
- Complete study to develop local emission factors for road dust (**PM**)
- Select appropriate model to develop multi-pollutant emissions budget and perform regular analyses
- Develop protocol for periodic multi-pollutant, modeling quality emissions inventory

DEQ Air Quality Protection Strategies

- Establish interim PM_{10} motor vehicle emissions budget cap and evaluate transportation plans and projects for compliance
- Implement permitting policy or rules to treat all industrial sources consistently within the airshed. Continue issuing operating permits to limit potential to emit throughout Treasure Valley.
- Participate in forest and range smoke management program
- Initiate voluntary agricultural smoke management program
- Review analyses of air quality impacts of transportation plans and projects

Community Air Quality Protection Strategies

- Form a group to evaluate local ordinances for consistent regulation of air pollution sources
- Form a group to develop cost-benefit information on recommended community control strategies
- Form a group to study what other communities have done to include air quality goals and objectives in comprehensive plans
- Analyze transportation plans and projects for impact on air quality

2002

- Community Outreach**
- Continue to gather input from community, public meetings, Airshed Advisory Group, Multi-Agency Group, and feedback from Annual Report
 - Hold 4 to 6 Public Meetings
 - Finalize Community Vision/Goals and indicators to track progress
 - Continue to enhance web site
 - Develop recognition program
 - Utilize GIS tool to display modeling results and for education
 - Provide Annual Monitoring Network Review for public comment

- Scientific Studies**
- Begin monitoring HAPs, ozone and other pollutants
 - Evaluate first three years of PM_{2.5} data
 - Complete PM₁₀ Emissions Inventory as part of PM₁₀ Maintenance Plan
 - Complete PM₁₀ Receptor Modeling as part of PM₁₀ Maintenance Plan
 - Complete PM₁₀ Dispersion Modeling as part of PM₁₀ Maintenance Plan
 - Submit PM₁₀ Maintenance Plan to EPA
 - Design modeling to be used to develop multi-pollutant emissions budget (PM₁₀, PM_{2.5}, NOx, SOx, and NH₃)
 - Develop first periodic multi-pollutant emissions inventory

- DEQ Air Quality Protection Strategies**
- Develop agreements with Oregon and local communities to promote Airshed Management approach
 - Continue issuing operating permits on consistent basis across the airshed. Permits will limit potential to emit throughout Treasure Valley.
 - Begin to modify industrial permits to address PM precursors and condensable particulate matter
 - Participate in forest and range smoke management programs and agricultural smoke management programs
 - Review analyses of air quality impacts of transportation plans and projects
 - Develop policies and/or regulations necessary to establish and utilize emissions budgets

- Community Air Quality Protection Strategies**
- Analyze transportation plans and projects for impact on air quality
 - Implement control strategies via adopting local ordinances; may include ordinances on open burning, dust, and/or vehicle testing
 - Review zoning regulations and impact on land use/transportation patterns

2003

- Community Outreach**
- Continue to gather input from community, public meetings, Airshed Advisory Group, Multi-Agency Group
 - Hold 4 to 6 Public Meetings
 - Continue to enhance web site
 - Produce first annual report on indicators/progress toward community vision
 - Implement recognition program
 - Utilize GIS tool to display modeling results and assist in establishment of emissions budget
 - Provide Annual Monitoring Network Review for public comment

- Scientific Studies**
- Initiate monitoring in Payette, Gem and Elmore Counties
 - Determine initial emission budgets

- DEQ Air Quality Protection Strategies**
- Continue issuing operating permits on consistent basis across the airshed. Permits will limit potential to emit throughout Treasure Valley and address precursors and condensable particulate matter.
 - Participate in forest and range smoke management programs and agricultural smoke management programs
 - Develop emissions trading program
 - Review analyses of air quality impacts of transportation plans and projects

- Community Air Quality Protection Strategies**
- Analyze transportation plans and projects for impact on air quality
 - Propose new land use and zoning regulations
 - Adopt local ordinances to manage air quality consistently

2004

Community Outreach

- Continue to gather input from community, public meetings, Airshed Advisory Group, Multi-Agency Group, and feedback from Annual Report
- Finalize Community Vision/Goals and indicators to track progress
- Enhance web site
- Summarize Vision, Priority Issues and Strategies into Treasure Valley Airshed Management Program document
- Continue to implement recognition program
- Distribute annual report on indicators/progress toward community vision
- Continue to use GIS tool to display modeling results and refine emissions budget
- Conduct Air Quality Public Opinion survey and public awareness campaign for input into Treasure Valley Airshed Management Program document
- Provide Annual Monitoring Network Review for public comment

Scientific Studies

- Finalize and summarize modeling
- Finalize emissions budget

DEQ Air Quality Protection Strategies

- Continue issuing industrial permits under revised policies
- Participate in forest and range smoke management programs and agricultural smoke management programs
- Finalize emissions trading program
- Review analyses of air quality impacts of transportation plans and projects

Community Air Quality Protection Strategies

- Analyze transportation plans and projects for impact on air quality

2005

- Community Outreach**
- Continue to gather input from community, public meetings, Airshed Advisory Group, Multi-Agency Group, feedback from Annual Report
 - Hold 4 to 6 Public Meetings
 - Continue to enhance web site
 - Continue to implement recognition program
 - Seek approval/adoption of Treasure Valley Airshed Management Program
 - **D**istribute annual report on indicators/progress toward community vision

- Scientific Studies**
- Begin planning for second periodic emissions inventory

- DEQ Air Quality Protection Strategies**
- Implement multi-pollutant (PM_{10} , $PM_{2.5}$, NO_x , SO_x , and NH_3) emission budgets and emissions trading program
 - Participate in forest and range smoke management programs and agricultural smoke management programs
 - Continue issuing industrial permits under revised policies
 - Review analyses of air quality impacts of transportation plans and projects

- Community Air Quality Protection Strategies**
- Analyze transportation plans and programs for impact on air quality

glossary

Air Quality Model – A computer program which simulates air quality conditions based on data about pollution emissions, concentrations, meteorology and topography. Different scenarios may be modeled to compare impacts.

Airshed – An area covered by a volume of air with similar characteristics and separated from other volumes of air by weather patterns or topography.

Airshed Management – A method of managing air pollution that addresses sources from an entire airshed, and is designed to be proactive, reflect community desires, and ensure good air quality in the future.

Emissions budget – A limit or cap on the total amount of pollution that can be produced in the airshed, and allocates portions of that total among the various pollution sources in the airshed.

Emissions inventory – A study that estimates the total amount of any pollutant that is emitted in an area, derived by determining emissions from all sources within the area. Future emissions levels may be estimated by applying appropriate growth multipliers.

Fenceline Impacts – A measurement of the amount of pollution found at the “fenceline,” or property boundary of a facility.

Fugitive Road Dust – Particulate matter pollution created when vehicles blow dust and dirt off of roads.

Grandfathered Sources – Sources of air pollution that existed before Clean Air Act requirements to control air pollution, and, therefore, are exempt from those rules.

Inversion – A meteorological condition that occurs when heavy, cold air is trapped near the ground beneath warmer, lighter air. This condition suppresses the movement of air. Pollution, instead of being flushed out of the area, builds up over several days, causing concentrations of air pollution to increase.

Mixing height – The elevation to which pollutants are mixed. Above the mixing height, the exchange of ground level air is limited. Low mixing heights mean that the air is generally stagnant, causing pollutants to be trapped near the ground.

National Ambient Air Quality Standards – Standards or limits set by the EPA on the allowable amount of an air pollutant. Standards are set at the level required to protect public health.

Nonattainment Area – An area that has violated air quality standards, or limits, established by the Environmental Protection Agency. These areas are subject to stricter limits on emissions, and must develop a detailed Plan to address the problem.

Precursor – A substance that may undergo chemical reaction in the air and become a secondary pollutant.

Primary pollutant – A pollutant that is emitted directly into the air, in contrast to a secondary pollutant.

Saturation Study – A short-term monitoring study at multiple locations designed to determine the areas of peak concentration, or to determine the physical extent of an air pollution problem.

Stagnation – A meteorological condition in which the mixing of air is reduced, allowing pollution to build up near the ground. Often caused by an inversion.

Secondary pollutants – Pollution that forms in the air through a chemical reaction between precursor gasses or primary pollutants.

Transportation Conformity – An amendment to the Clean Air Act requiring that, within a nonattainment area, all transportation plans and programs conform to air quality plans. Conformity is designed to ensure that efforts to improve air quality are not hampered by increasing impacts of transportation. For areas that cannot demonstrate conformity, federal funding for highways and transportation can be withheld.

Transportation Impact Analysis – An assessment of proposed transportation plans or roadway expansions and their impact on air quality.

acronyms

CFR – Code of Federal Register

DEQ – Department of Environmental Quality

EPA – Environmental Protection Agency

EPHA – Environmental Protection and Health Act

GIS – Geographic Information Systems

NAAQS – See National Ambient Air Quality Standards.

NO_x – An atom of nitrogen combined with one or more (x) atoms of oxygen. An air pollutant.

PM₁₀ – Airborne particles 10 microns or less in aerodynamic diameter

PM_{2.5} – Airborne particles 2.5 microns or less in aerodynamic diameter

ppm – Parts per million

SO_x – An atom of sulfur combined with one or more (x) atoms of oxygen. An air pollutant.

TSP – Total Suspended Particulate

ug/m³ – Micrograms per Cubic Meter

end notes

¹Idaho Code 39-105(3)(j)

²Idaho Code 39-105(2) and 39-107(8). The Rules for the Control of Air Pollution in Idaho (Rules), IDAPA 58.01.01, are promulgated pursuant to Idaho Code 39-105 and 39-107.

³Rulemaking is conducted pursuant to the Administrative Procedure Act, as required under Idaho Code 39-107(9).

⁴Air Quality Climate in the Columbia Basin," United States Department of Agriculture, August, 1999.

– Industrial permitting rules are found in:

⁵IDAPA 58.01.01.200-500

⁶IDAPA 58.01.01.650-651

⁷IDAPA 58.01.01.600-616

feedback form

We would like to hear from you!

What is your opinion of the direction DEQ is taking with respect to managing air quality?

Please describe what you think the vision for the future of air quality in the Treasure Valley should be.

Please list some specific air quality goals that will support your vision for air quality.

What steps would you be willing to take to help protect air quality?

- Please add me to your mailing list to learn more about air quality issues.
(You can fill in the form below or call us at (208) 373-0550.)

Optional

Name _____

Organizaton, if any _____

Street Address _____

City, State _____ Zip _____

Please fold on dotted line and tape closed.

Return Address

Place
First-Class
Stamp
Here

Treasure Valley Airshed Management Program
Boise Regional Office
Department of Environmental Quality
1445 North Orchard
Boise, ID 83706-2239

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