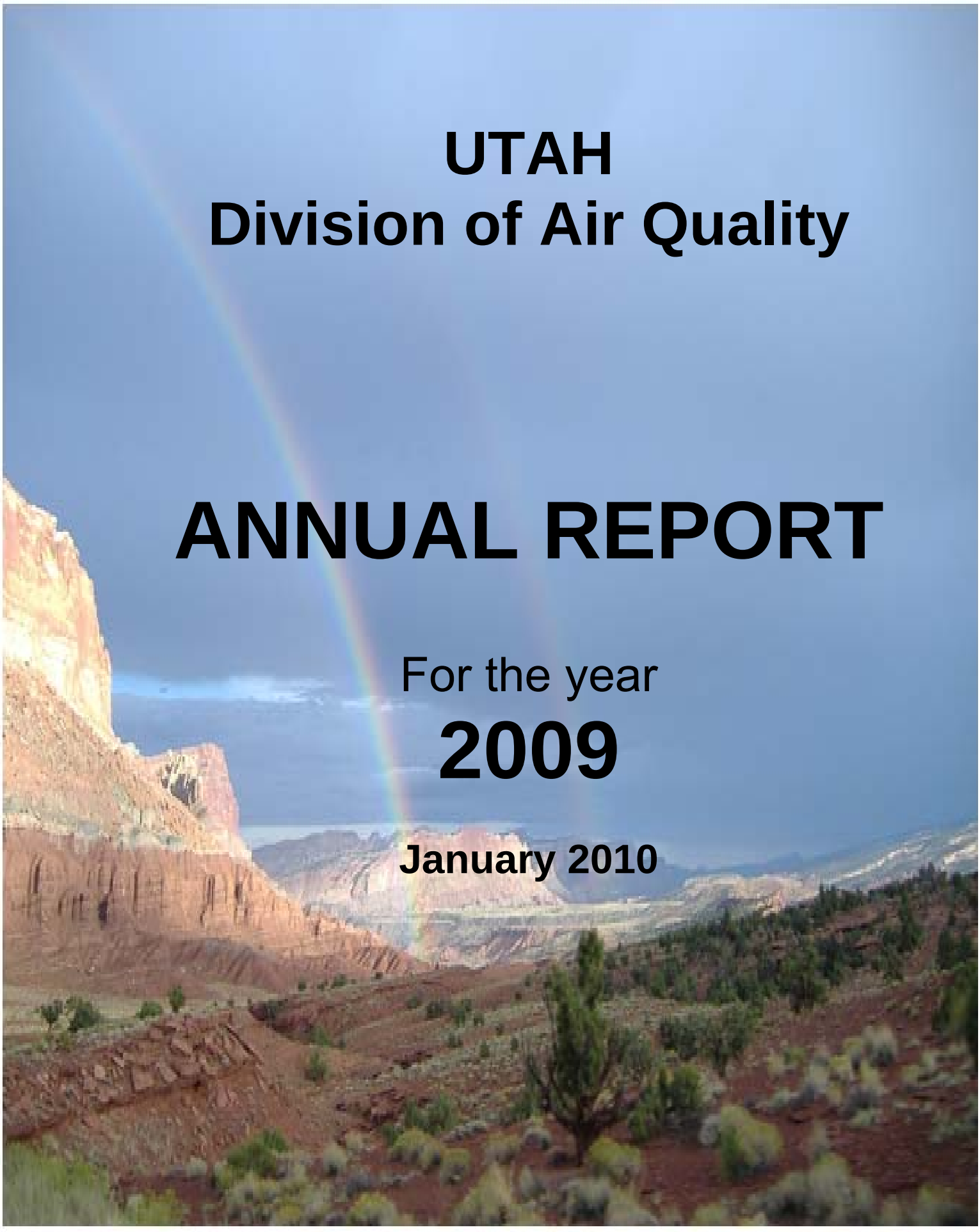

UTAH
Division of Air Quality

ANNUAL REPORT

For the year

2009

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Introduction

Utah Division of Air Quality

The mission of the Utah Division of Air Quality (DAQ) is to protect public health and the environment from the harmful effects of air pollution. It is the responsibility of DAQ to ensure that the air in Utah meets health and visibility standards established under the federal Clean Air Act (CAA). To fulfill this responsibility, DAQ is required by the federal government to ensure compliance with the U.S. Environmental Protection Agency's (EPA) National Ambient Air Quality Standards (NAAQS) statewide and visibility standards at National Parks. DAQ enacts rules pertaining to air quality standards, develops plans to meet the federal standards when necessary, issues preconstruction and operating permits to stationary sources, and ensures compliance with state and federal air quality rules.

Utah's mountain and valley topography, diverse economy, and a rapidly growing population create air quality challenges for the state. Despite these challenges, Utah's air is significantly cleaner than it was 25 years ago. In the early 1980s, the health standards for four of the six major ambient air pollutants identified by the EPA were violated in one or more Utah counties. More stringent federal and state regulations for motor vehicles and industry, as well as other emission controls developed as part of the State Implementation Plan for Utah, have resulted in reduced air pollution and improved visibility.

The DAQ allocates a large portion of its resources to implementing the CAA. The Utah Air Conservation Act empowers the Utah Air Quality Board to enact rules pertaining to air quality issues. The DAQ staff supports the Board in its policy making role. Board membership provides representation from industry, local government, environmental groups, and the public, and includes the Executive Director of the Department of Environmental Quality. The eleven board members have diverse interests, are knowledgeable in air pollution matters, and are appointed by the Governor with consent of the Senate. The Director of DAQ is the Board's Executive Secretary.

The Utah Air Quality Rules describe and define the Utah air quality program. Implementation of the rules requires DAQ interaction with industry, other government agencies and the public. The state air quality program is responsible for the implementation of the federal standards under the CAA as well as state rules for pollution sources not regulated by the CAA.

2009 Synopsis

Despite an ever-increasing population and industrial base, Utah's monitored concentrations of all federal health standards for criteria air pollutants have either stayed the same or continued their decreasing trends.

On March 12, 2008, the EPA revised the NAAQS for ozone. EPA tightened the standard and eliminated the rounding convention that was found in the old standard. This, in effect, lowered

the ozone standard from 0.084 part per million (ppm) to 0.075 ppm. EPA announced that it will reconsider this new standard in response to a court challenge and is expected to publish a revised lower standard in 2010. As a result of the 2008 standard change, there are several areas along the Wasatch Front that currently have monitoring data above the new standard (refer to the DAQ website for the data, http://www.airquality.utah.gov/Public-Interest/about_pollutants/pdf/Ozone_8%20hr_3-yr_avg_1.pdf.

Efforts have been made by DAQ to curb the levels of particulate matter. During wintertime episodes of air stagnation and temperature inversion, low-lying valleys routinely experience elevated concentrations of both particulate matter smaller than 10 microns in diameter (PM_{10}) and particulate matter smaller than 2.5 microns in diameter ($PM_{2.5}$). Although PM_{10} concentrations no longer exceed the standard under these conditions, the new $PM_{2.5}$ standard is low enough that it is violated in several areas along the Wasatch Front as well as in the Cache Valley.

EPA revised the 24-hour standard for $PM_{2.5}$ on September 21, 2006, strengthening it from the 1997 level of 65 $\mu g/m^3$ to 35 $\mu g/m^3$. It is based on a three-year average of the 98th percentile of monitored values. The annual standard of 15 $\mu g/m^3$ was retained from the 1997 standards. All areas of Utah had been in compliance with the 1997 standards. Ambient 24-hour $PM_{2.5}$ concentrations have steadily decreased along the Wasatch front from 2000 through 2007. DAQ spent significant resources during 2007 to analyze the areas that did not meet the new standard, and in December of that year, submitted a recommendation to EPA as to which areas should be designated nonattainment for the new standard. DAQ spent much of 2009 working with EPA to finalize the nonattainment area boundaries. EPA made its determination with an effective date of December 14, 2009. Utah's three nonattainment areas for $PM_{2.5}$ are as follows: The Provo nonattainment includes all of Utah County except for the mountainous areas east of Utah Valley. The Salt Lake City nonattainment area encompasses the remainder of the Wasatch Front. It includes all of Salt Lake and Davis Counties, all of Weber County west of the Wasatch Front, a portion of Tooele Valley, and a portion of Box Elder County surrounding Brigham City. Finally, the Logan nonattainment area includes all of Cache Valley; including the portion on the Idaho side of the border (see Figure 2 for a map of the nonattainment areas).

On July 15, 2009, the EPA published a proposal to supplement the current annual standard for nitrogen dioxide (NO_2) by establishing a new short-term standard based on the 3-year average of the 99th percentile (or 4th highest) of 1-hour daily maximum concentrations. EPA also proposes to establish requirements for an NO_2 monitoring network that will include monitors within 50 meters of major roadways. Because the proposed standard is based on hourly monitoring and the primary standard is based on an annual mean, the DAQ has initiated a review of the proposed standard to assess the ramifications. Consistent with the terms of a consent decree, the EPA will sign a notice of final rule making by January 22, 2010.

On October 12, 2009, the State of Utah made a recommendation to the EPA that all 29 counties in Utah be designated unclassifiable for the primary and secondary lead standards. With approval from EPA Region 8, the State has not monitored for lead in the ambient air since September 2005. Lead monitoring was halted because measured levels of lead were extremely low relative to the former primary and secondary lead standards (1.5 µg/m3 quarterly average). DAQ is reviewing the new monitoring requirements. The complete lead monitoring plan is available at, www.airmonitoring.utah.gov/network/2009Leadadd.pdf.

On November 17, 2009, the EPA proposed a new one hour standard for SO_2 between 0.050 and 0.100 ppm and to eliminate the 24 hour and annual primary standards. The SO_2 standard has not changed since 1971. Historical ambient monitoring shows that Utah's air has been well within the federal health standard. DAQ's review of the proposed standard indicates that Utah's air is below the proposed values.

DAQ consolidated the air monitoring network to increase efficiency and to maximize the data necessary to support air modeling. Sites were also added to monitor strategically for lead and to gain data for rural areas. Additional monitoring stations and/or re-arrangement of existing stations may be necessary to accommodate requirements in the future SO_2, NO_2 and lead rules.

On September 22, 2009, EPA finalized the Mandatory Greenhouse Gas (GHG) Reporting Rule. The rule became effective December 29, 2009. This action includes final reporting requirements for 31 of the 42 emission sources listed in the proposal. EPA will finalize the remaining source categories as it continues to further consider comments and options. Under the rule, suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more of carbon dioxide equivalents per year are required to submit annual reports to EPA. The intent of the rule is to provide a better understanding of where GHG's are coming from in order to guide development of the best possible policies and programs to reduce emissions. While EPA will be administrating this rule, DAQ will remain cognizant of the program.

The Utah Supreme Court ruled on a permit that had been issued in 2004 for a coal-fired power plant to be located near Sigurd, UT. The Sierra Club and a local citizens group had appealed the permit over several issues that they felt were inadequately addressed in the permit. The Air Quality Board heard three full days of testimony in 2008 and upheld the permit with no changes. The Sierra Club and citizens then appealed the Board's decision to the Utah Supreme Court. The court handed down its ruling on December 4, 2009 and upheld the division on almost all issues. However there were three issues that were either remanded or set aside by the court. While these three issues are still being reviewed by the source who has not yet determined how they would like to proceed, the division has begun the process of reviewing internal procedures to address the court ruling on those issues.

Regulatory advancements in 2009 will mandate the following efforts in 2010, requiring resource allocations:

- Revising the ozone SIP to reflect the new nonattainment areas resulting from the EPA standard 2008 revision and anticipated 2010 standard modification.
- Revising the $PM_{2.5}$ SIP to reflect the new nonattainment areas designations by EPA.
- SO_2 monitoring and compliance effort(s) related to the final EPA standard.
- NO_2 monitoring and compliance effort(s) related to the final EPA standard.
- Initiate lead sampling per the lead rule.
- Implementation of the Maximum Achievable Control Technology rule for mercury that was issued by EPA on May 18, 2005.

Division Organization

The DAQ is divided into three separate branches: Planning, Compliance, and Permitting. The *Permitting Branch* is responsible for issuing construction and operating permits to stationary sources that emit air pollutants, and is comprised of three sections: Minor Source New Source Review (NSR), Major Source NSR, and Operating Permits. Construction permits are issued to new or modified stationary sources of air pollution through the New Source Review program. Operating permits are issued on an ongoing basis through Title V of the CAA to "major" stationary sources.

The *Planning Branch* is responsible for developing comprehensive plans to reduce air pollution and is comprised of four sections: The Air Monitoring Center (AMC), Mobile Sources, SIP/Rules, and Technical Analysis. The AMC is responsible for establishing and operating the monitoring network to gather and analyze data used to determine concentrations of ambient air pollutants. Planning staff in the three remaining sections routinely compile emissions inventories in order to understand the origins of the various contaminants detected in the air, and use computer models to evaluate the impacts of new and existing sources of air pollution. They also use computer models to understand the relationship between the emissions, meteorology, and pollutant concentrations measured in the air. The Branch is also involved in identifying the air quality impacts of transportation issues which include vehicle inspection and maintenance, clean fuels, and highway construction. This information must be considered in the development of State Implementation Plans in order to ensure that Utah's ambient air remains in compliance with the federal health standards, even as our population and our economy continue to grow.

The *Compliance Branch* has responsibility for ensuring that industries and residents comply with Utah's air quality regulations, and is comprised of three sections: Major Source Compliance; Minor Source Compliance; and Air Toxics, Lead-Based Paint, Asbestos, and Small Business Environmental Assistance (ATLAS). The Major and Minor Source Compliance Sections are responsible for ensuring that all Utah air quality regulatory requirements are met. This is done through inspections and enforcement. The ATLAS Section is responsible for the regulation, under various EPA air quality programs, of toxic air pollutants, also known as Hazardous Air Pollutants (HAPs). HAPs are those pollutants listed in the CAA that are known or suspected to cause cancer and other serious health problems. The ATLAS section is also responsible for the enforcement of federal and state regulations for preconstruction asbestos removal and a number of outreach and enforcement programs designed to reduce exposure to lead-based paint.

The ATLAS section also assists small businesses in complying with state and federal regulations including New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), NSR, and Utah Air Quality Rules. The Small Business Environmental Assistance Program can advise small businesses on permitting requirements, emission calculations, technical issues, and pollution prevention techniques.

Air Quality Standards

The Clean Air Act as last amended in 1990 requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA established two types of air quality standards: primary and secondary standards. Primary standards are set to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards are set to protect public welfare, including protection including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA has established health-based NAAQS for six pollutants known as "criteria pollutants." These are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Each of these pollutants is addressed in greater detail later in this chapter, while Table 2 provides a brief description of each. The primary health standards are established by EPA after considering both the concentration level and the duration of exposure that can cause adverse health effects. Pollutant concentrations that exceed the NAAQS are considered unhealthy. The DAQ monitors each of these criteria pollutants, as well as several non-criteria pollutants for special studies.

Table 1. *EPA Designated Criteria Pollutants*

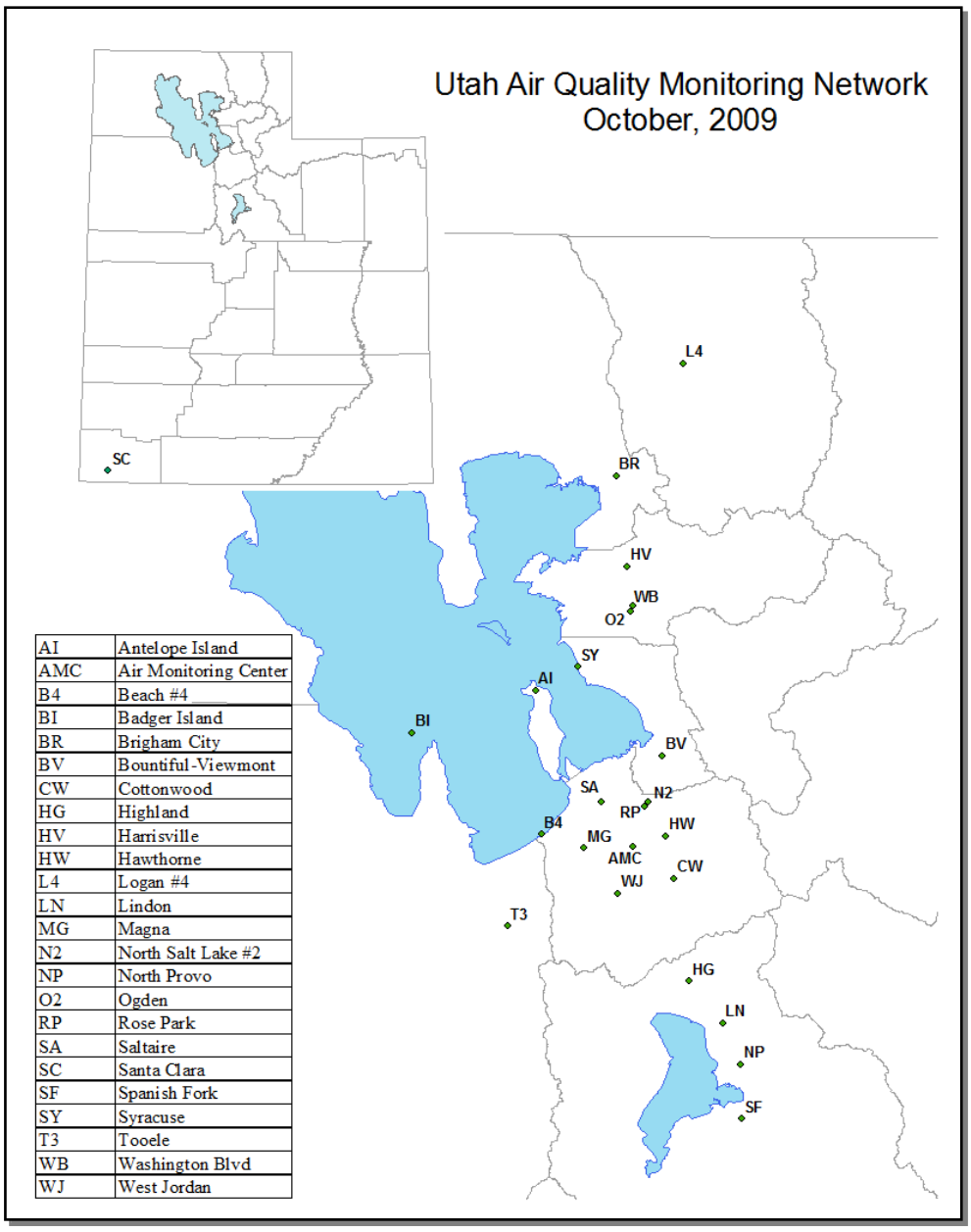
Name	Sources	Health Effects	Welfare Effects
Carbon Monoxide (CO); a clear, colorless, odorless gas	Burning of gasoline, wood, natural gas, coal, oil, etc.	Reduces the ability of blood to transport oxygen to body cells and tissues. Carbon monoxide may be particularly hazardous to people who have heart or circulatory (blood vessel) problems and people who have damaged lungs or breathing passages.	
Lead (Pb)	Paint (houses, cars), smelters (metal refineries); manufacture of lead storage batteries; note: burning leaded gasoline was the primary source of lead pollution in the US until unleaded gasoline was mandated by the federal government.	Lead damages nervous systems, including brains, and causes digestive system damage. Children are at special risk. Some lead-containing chemicals cause cancer in animals.	Lead can harm wildlife
Nitrogen Dioxide (NO_2) (one component of NO_x); smog-forming chemical	Burning of gasoline, natural gas, coal, oil, and other fuels; Cars are also an important source of NO_2.	Nitrogen dioxide can cause lung damage, illnesses of breathing passages and lungs (respiratory system).	Nitrogen dioxide is an ingredient of acid rain (acid aerosols), which can damage trees, lakes, flora and fauna. Acid aerosols can also reduce visibility.
Ozone (O_3) (ground-level ozone is the principal component of smog)	Chemical reaction of pollutants; VOCs and NO_x.	Ozone can cause breathing problems, reduced lung function, asthma, irritated eyes, stuffy noses, and reduced resistance to colds and other infections. It may also speed up aging of lung tissue.	Ozone can damage plants and trees; smog can cause reduced visibility.
Particulate Matter (PM_{10}, $PM_{2.5}$); dust, smoke, soot	Burning of gasoline, natural gas, coal, oil and other fuels; industrial plants; agriculture (plowing or burning fields); unpaved roads, mining, construction activities. Particles are also formed from the reaction of VOCs, NO_x, SO_x and other pollutants in the air.	Particulate matter can cause nose and throat irritation, lung damage, bronchitis, and early death.	Particulate Matter is the main source of haze that reduces visibility.
Sulfur Dioxide (SO_2)	Burning of coal and oil (including diesel and gasoline); industrial processes.	Sulfur dioxide can cause breathing problems and may cause permanent damage to lungs.	SO_2 is an ingredient in acid rain (acid aerosols), which can damage trees, lakes, flora and fauna. Acid aerosols can also reduce visibility.

Ambient Air Quality in Utah

Utah's Air Monitoring Network

The Air Monitoring Center operates a network of monitoring stations along the Wasatch Front from Logan to Spanish Fork and in Santa Clara, Utah. The monitors are situated to measure air quality in both neighborhoods and industrial areas. Figure 1 shows the general location of the active monitoring sites in Utah. Table 1 presents the monitoring station locations and monitored constituents. Meteorological data are collected at many locations to provide localized data for air quality modeling that is used to evaluate the impacts of new sources and to assess the effectiveness of regional mitigation strategies.

Figure 1. *Utah Air Monitoring Network*



AI	Antelope Island
AMC	Air Monitoring Center
B4	Beach #4
BI	Badger Island
BR	Brigham City
BV	Bountiful-Viewmont
CW	Cottonwood
HG	Highland
HV	Harrisville
HW	Hawthorne
L4	Logan #4
LN	Lindon
MG	Magna
N2	North Salt Lake #2
NP	North Provo
O2	Ogden
RP	Rose Park
SA	Saltaire
SC	Santa Clara
SF	Spanish Fork
SY	Syracuse
T3	Tooele
WB	Washington Blvd
WJ	West Jordan

Table 2. *Utah Monitoring Network Stations*

Station	City	Address	CO	NO_2	Hg	O_3	PM_{10}	$PM_{2.5}$	SO_2	Met.
Antelope Island	None	North end of island								X
Badger Island	None	On Island								X
Beach	Lakepoint	12100 W. 1200 S.				X			X	X
Bountiful	Bountiful	171 W. 1370 N.		X		X		X	X	X
Brigham City	Brigham City	140 W. Fishburn Dr.				X		X		X
Cottonwood	SLC	5715 S. 1400 E.	X	X		X	X	X		X
Harrisville	Harrisville	425 W. 2250 N.				X		X		X
Hawthorne	SLC	1675 S. 600 E.	X	X		X	X	X		X
Highland	Highland	10865 N. 6000 W.				X		X		X
Lindon	Lindon	30 N. Main St.					X	X		X
Logan	Logan	125 W. Center St.	X			X	X	X		X
Magna	Magna	2935 S. 8560 W.					X	X	X	X
North Provo	Provo	1355 N. 200 W.	X	X		X	X	X		X
N. Salt Lake	SLC	1795 N. Warm Springs Rd.					X		X	
Air Monitoring center	SLC	2861 W. Parkway Blvd.			X					
Ogden #2	Ogden	228 32nd St.		X			X	X		
Rose Park	SLC	1375 W. 1230 N.						X		
Saltaire	None	NW of Int'l Center								X
Spanish Fork	Spanish Fork	312 W. 2050 N.				X		X		X
Syracuse	Syracuse	5100 W. 1700 S.								X
Tooele	Tooele	434 N. 50 W.				X		X		X
Washington Blvd.	Ogden	2540 S. Washington Blvd.	X							
West Jordan	West Jordan									X
Santa Clara	Santa Clara	1215 N Lava Flow Dr (Snow Canyon Middle School)				X				X

NAAQS Nonattainment & Maintenance Areas

Areas that are not in compliance with the NAAQS are referred to as nonattainment areas. Figure 2 is a map of the current nonattainment areas within the state. A maintenance area is an area that was once designated as nonattainment, and which subsequently demonstrated to EPA statistically that it will attain and maintain a particular standard for a period of 10 years. EPA must approve the demonstration. Figure 3, on the following page, is a map of the current maintenance areas within the state.

Figure 2 *Utah Non attainment Areas as of December 31, 2009*

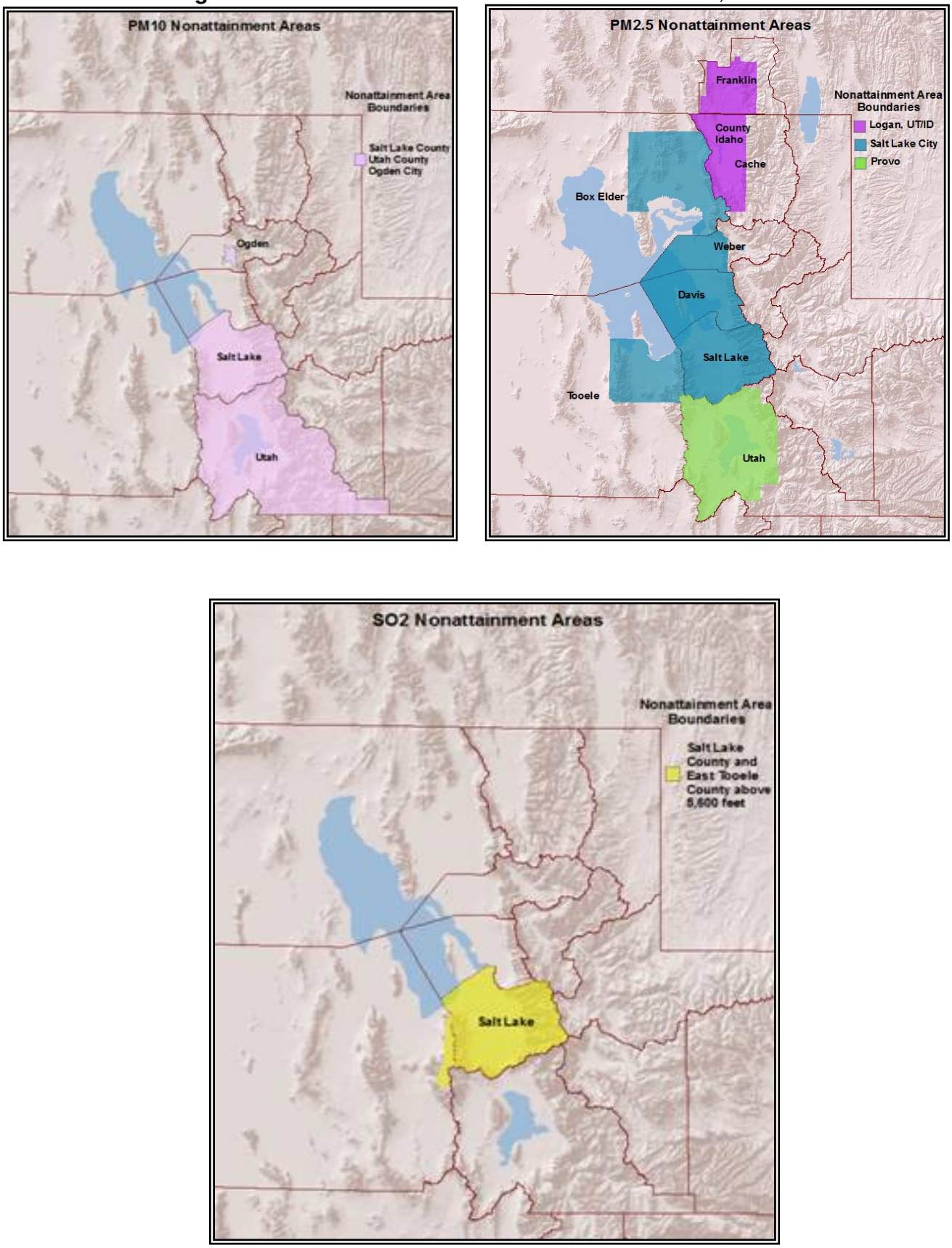
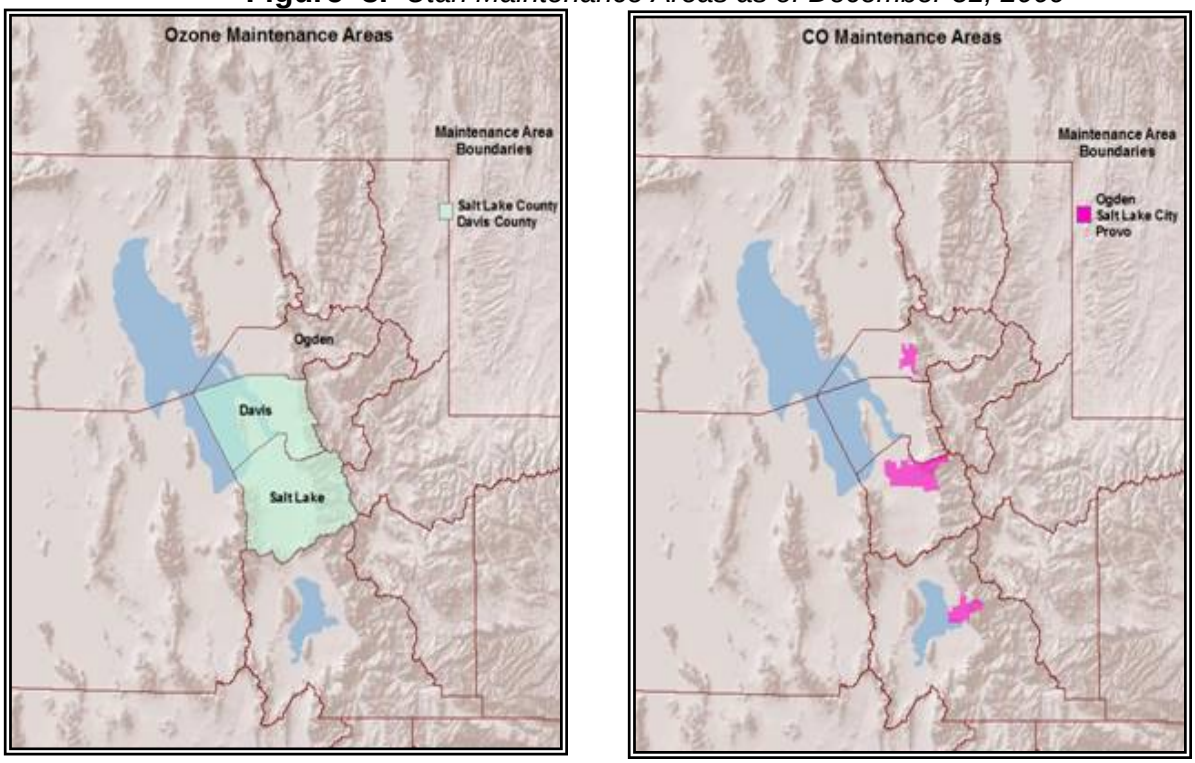


Figure 3. *Utah Maintenance Areas as of December 31, 2009*



Criteria Air Pollutants

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless and odorless gas, formed by the incomplete combustion of carbon fuel. Carbon monoxide is primarily produced from on-road motor vehicle emissions. Other significant sources of CO emissions are wood burning stoves and fireplaces. The remaining emissions come from industrial facilities, construction equipment, miscellaneous mobile sources and other types of space heating.

Because motor vehicle emissions are the major source of CO, the highest concentrations occur during morning and evening rush hours near high traffic areas. The worst problems occur when there are large numbers of slow-moving vehicles in large parking lots, busy intersections, and traffic jams. Carbon monoxide problems are greater in winter due to several factors: cold weather makes motor vehicles run less efficiently, wood burning and other space heating takes place in the winter, and cold weather temperature inversions trap CO near the ground.

Standards

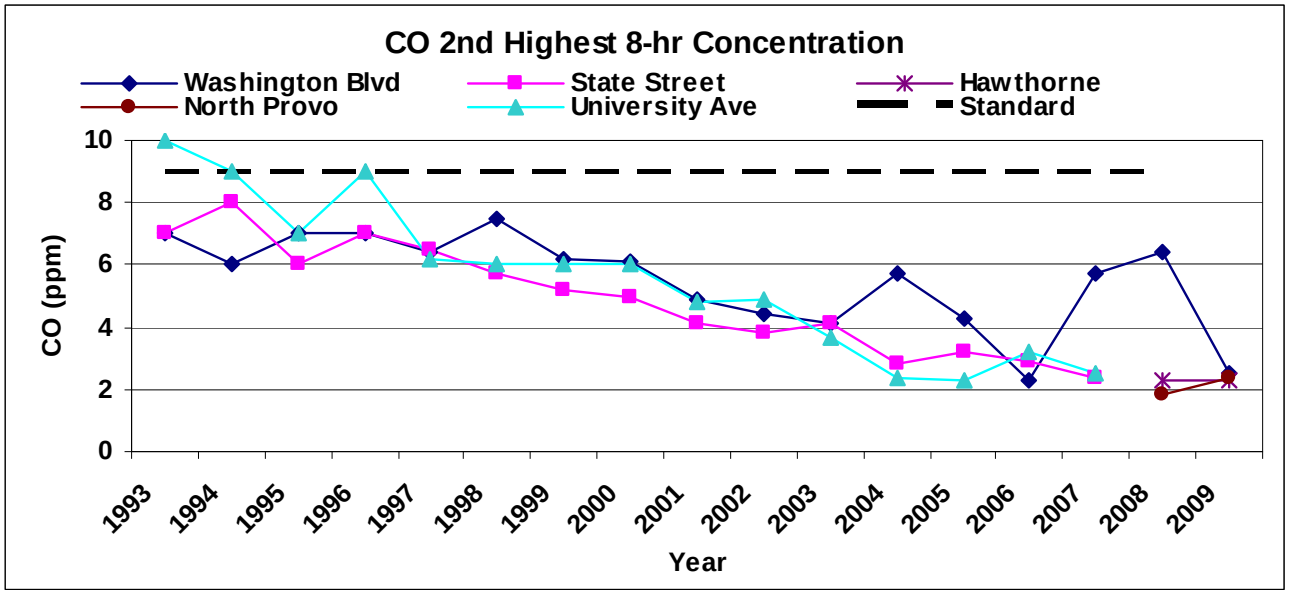
The EPA has developed two national standards for CO. They are 35 ppm of CO averaged over a 1-hour period and 9 ppm of CO averaged over an 8-hour period. A violation of the NAAQS occurs with the second exceedance of either standard at a single location in a calendar year. Once a location measures a second exceedance of either standard, it is considered to be in

violation and becomes designated as a "nonattainment area." Three cities in Utah (Salt Lake City, Ogden, and Provo) were at one time designated nonattainment areas for CO. Due primarily to improvements in motor vehicle technology, The State of Utah has been in compliance with the CO standards since 1994. Salt Lake City, Ogden, and Provo were successfully re-designated to "attainment" status in 1999, 2001, and 2006 respectively.

Carbon Monoxide in 2009

No exceedances of the CO standards were observed anywhere in Utah during 2009. Figure 4 shows a 16-year trend in CO emissions. The steady decline is primarily due to improvements in vehicle emissions control technology. The causes of the higher concentrations monitored for Ogden in 2007 and 2008 seem to be from nearby vehicular traffic too close to the monitor. This site location is being reevaluated to remedy this type of situation.

Figure 4. *Carbon Monoxide Second Highest 8-hr. Concentration*



Lead (Pb)

Lead in the ambient air exists primarily as particulate matter in the respirable size range. Historically, the major source of lead was from gasoline. However, because leaded gasoline for automobiles was completely phased-out in the US by the end of 1995, lead from this source is no longer a significant problem. The extraction and processing of metallic ores is currently the major source of lead in Utah, followed by general aviation aircraft.

Standard

On November 12, 2008 EPA strengthened the NAAQS for lead. The previous standard for lead was a calendar quarter (3-month) average concentration, not to exceed 1.5 $\mu g/m^3$. The new standard is 0.15 $\mu g/m^3$, measured as a 3-month rolling average. Utah had not exceeded the health standard for lead since the late 1970s, and EPA authorized the discontinuation of lead monitoring in 2005. Previous monitoring indicates that lead levels in Utah will meet the

new standard. DAQ is reviewing the new monitoring requirements for lead and will revise the monitoring network as necessary to meet the new federal requirements.

Nitrogen Dioxide (NO_2)

During high temperature combustion, nitrogen in the air reacts with oxygen to produce various oxides of nitrogen, or NO_x, a reddish-brown gas. One of the oxides of nitrogen, NO_2, is considered a criteria pollutant.

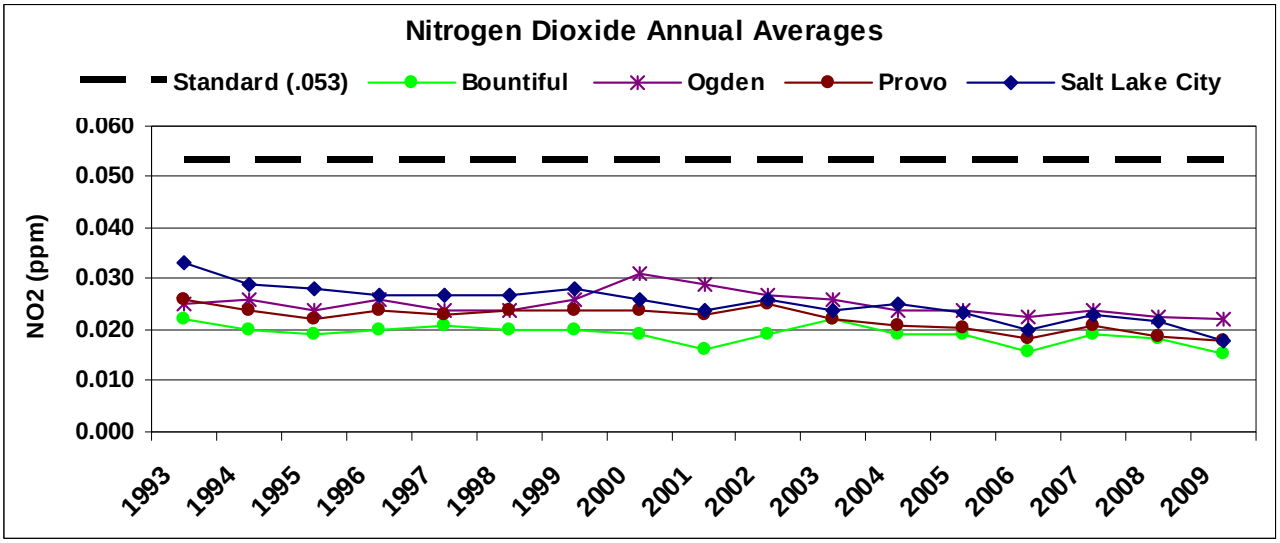
Standard

The annual standard for nitrogen dioxide is 0.053 ppm expressed as an annual arithmetic mean (average). The DAQ monitors the concentrations of NO_2 at various locations throughout the state, and has never observed a violation of the annual standard.

On July 15, 2009, the EPA published a proposal to supplement the current annual standard by establishing a new short-term standard based on the 3-year average of the 99th percentile (or 4th highest) of 1-hour daily maximum concentrations. EPA proposes to set the level of this new standard within the range of 0.080 to 0.100 ppm and solicits comment on standard levels as low as 0.065 ppm and as high as 0.150 ppm. Because the proposed standard is based on hourly monitoring and the primary standard is based on an annual mean, the DAQ has initiated a review of the proposed standard to assess the ramifications.

However, oxides of nitrogen react with other air contaminants to form other criteria pollutants. In the summer, photochemical reactions between NO_2 and volatile organic compounds lead to the formation of ground-level ozone. In the winter, NO_2 reacts with ammonia to form fine particulate matter ($PM_{2.5}$). Both of these seasonal scenarios can result in increased pollution. Utah continues to struggle with both the ozone and particulate matter standards, and because of this, DAQ is mindful of the trend in NO_2 emissions illustrated in Figure 5.

Figure 5. *Nitrogen Dioxide Annual Averages*



Ozone (O_3)

Ozone is a clear, colorless, gas composed of molecules of three oxygen atoms. Ground level ozone can be inhaled and is considered a pollutant. Ground-level ozone should not be confused with the stratospheric ozone layer that is located approximately 15 miles above the earth's surface. It is this layer that shields the earth from cancer-causing ultraviolet radiation. Ground level ozone is formed by a complex chemical reaction involving VOCs and oxides of nitrogen in the presence of sunlight.

Ozone production is a year-round phenomenon. However, the highest ozone levels occur during the summer when strong sunlight, high temperatures, and stagnant meteorological conditions combine to drive chemical reactions and trap the air within a region for several days. Some major sources for these pollutants are vehicle engine exhaust, emissions from industrial facilities, gasoline vapors, chemical solvents, and biogenic emissions from natural sources, like vegetative and trees.

Standard

On March 12, 2008 the EPA revised the NAAQS for ozone to 0.075 ppm. The standard is based on a 3-year average of the annual 4th highest daily 8-hour average concentration. Several areas along the Wasatch Front have current ambient monitoring data that met the standard prior to the 2008 revision, but do not meet this new standard. In March 2009, the State of Utah submitted a recommendation that Salt Lake County, Davis County, and the western portion of Weber County be designated nonattainment, and the rest of the state being designated as attainment/unclassifiable for the new standard.

In September, the EPA announced that they were reconsidering the ozone standard. The EPA was due to propose changes to the standard in early 2009 and then finalize those changes in August 2010. In the interim, EPA has put the designation process under the 2008 standard on hold.

Ozone in 2009

As a result of the tightening of the ozone standard discussed above, several counties (Weber, Davis, Salt Lake and Utah) are currently not attaining the new ozone standard. The following charts (Figures 6 and 7) illustrate recent trends in recorded ozone concentrations along the Wasatch Front relative to the new standard.

Figure 6 presents the NAAQS threshold which is the 3-year average of the 4th highest 8-hour ozone concentration from monitors along the Wasatch front. The heavy dashed line indicates the current standard of 0.075 ppm.

Figure 6. *Ozone 3-year Average 4th Highest 8-hr Concentration*

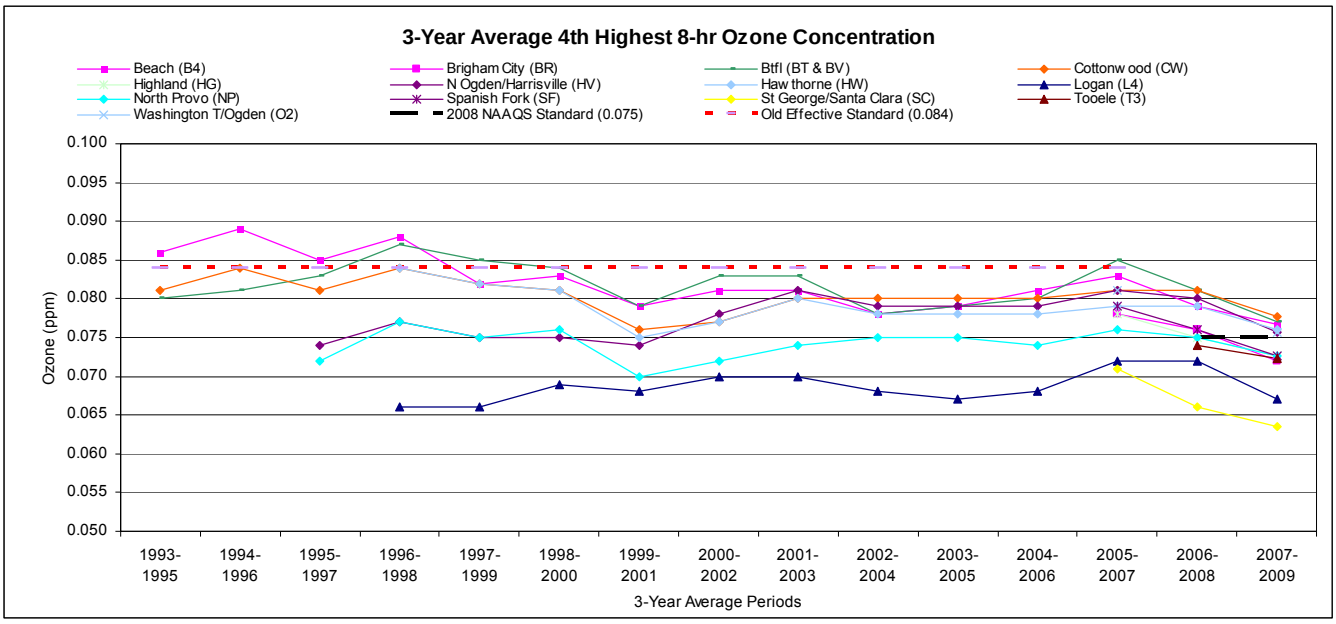
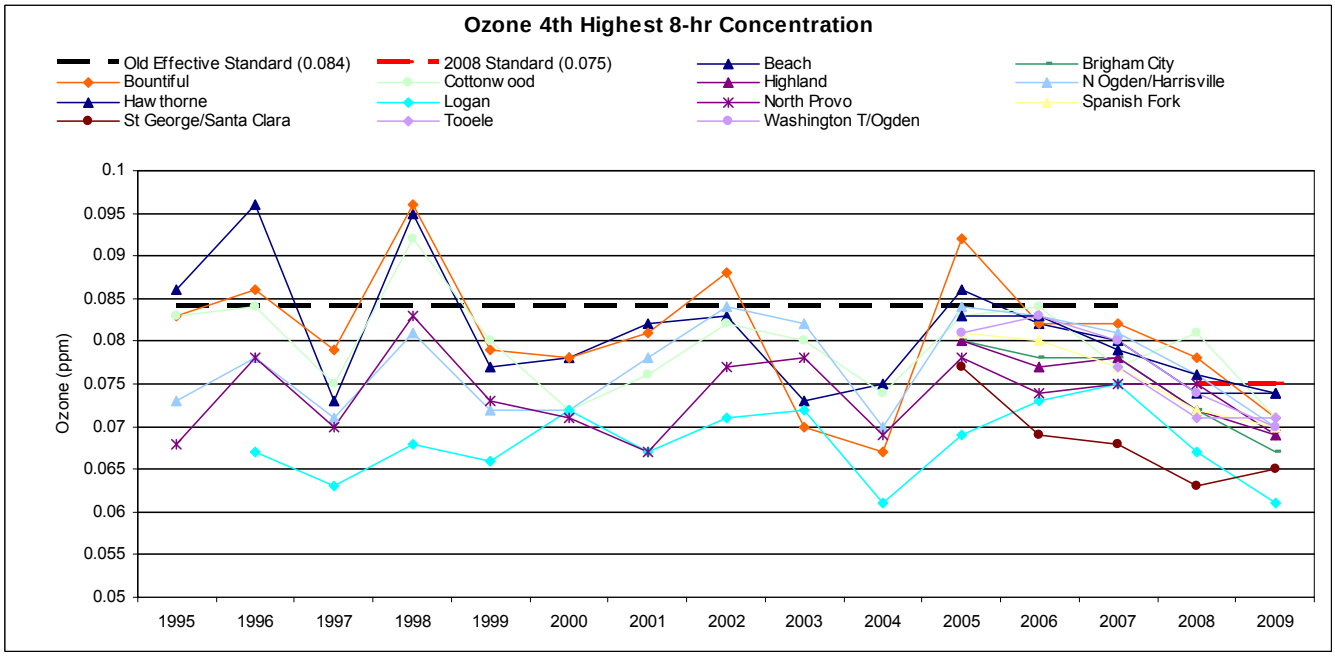


Figure 7 shows the 8-hour ozone concentrations by looking at the 4th highest annual concentration at network monitors for the past 14 years.

Figure 7. *Ozone 4th Highest 8-hr Concentration*



Particulate Matter (PM_{10} and $PM_{2.5}$)

Regulated particulate matter is a complex mixture of extremely tiny particles of solid or semi-solid material suspended in the atmosphere and is divided into two categories: PM_{10} and $PM_{2.5}$. PM_{10} is particulate less than 10 micrometers in diameter, which is about one-seventh the width of a strand of human hair. PM_{10} can lodge deep in the lungs and cause respiratory problems. The coarse fraction of PM_{10}, that which is larger than 2.5 microns, is typically made

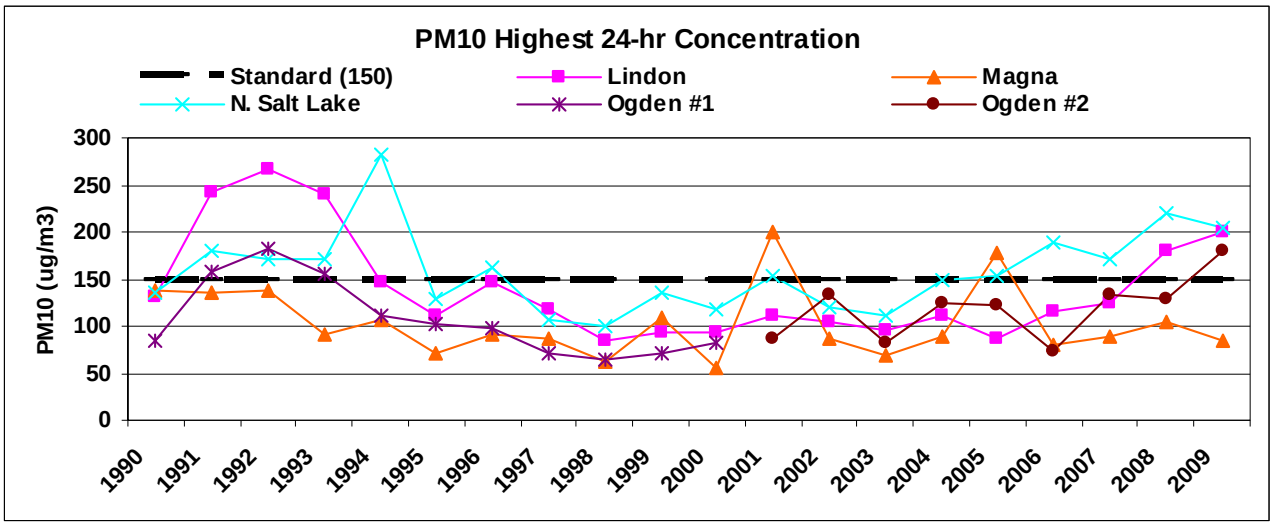
up of “fugitive dust” (sand and dirt blown by winds from roadways, fields, and construction sites) and contains large amounts of silicate (sand like) material.

$PM_{2.5}$, or fine particulate, is less than 2.5 micrometers in diameter and is generally produced from combustion sources and includes fly ash from power plants, carbon black from cars and trucks, and soot from fireplaces and woodstoves. Much of Utah’s $PM_{2.5}$ is called secondary aerosol meaning that it was not emitted directly as a particle, but was produced when gasses such as SO_2 and/or NOx reacted with other gasses in the atmosphere such as ammonia to become tiny particles. SO_2 and NOx are also products of combustion. Wintertime temperature inversions not only provide ideal conditions for the creation of secondary aerosols, but at the same time act to trap air in valleys long enough for concentrations of $PM_{2.5}$ to build up to levels that can be unhealthy. The smallest of particles that make up $PM_{2.5}$ are major contributors to visibility impairment in both urban and rural areas. Along the Wasatch Front, the effects can be seen as the thick brownish haze that lingers in our northern valleys, particularly in the winter. These particles are so small that they can become imbedded in human lung tissue, exacerbating respiratory diseases and cardiovascular problems. Other negative effects are reduced visibility and accelerated deterioration of buildings. DAQ currently operates PM_{10} and $PM_{2.5}$ monitors throughout the state to assess the ambient air quality with respect to the standards for both PM_{10} and $PM_{2.5}$.

Standards - PM_{10}

Annual and 24-hour air quality standards for PM_{10} were established by the EPA in July 1987. The 24-hour standard was set at 150 $\mu g/m^3$ and is met when the probability of exceeding the standard is no greater than once per year for a 3-year averaging period. In other words, four exceedances within a 3-year period would constitute a violation. The annual PM_{10} standard was set at 50 $\mu g/m^3$ and calculated as the 3-year average of annual means. The PM standards were revised by EPA in December of 2006. In so doing, the agency retained the 24-hour PM_{10} standard but revoked the annual standard. Utah had never violated the annual standard for PM_{10}, but Utah County, Salt Lake County, and Ogden City are officially designated as PM_{10} nonattainment areas because of past difficulty with the 24-hour standard. Figure 8 presents the highest 24-hour PM_{10} concentrations recorded at each station from 1990 to 2009. The heavy dashed line indicates the national ambient air quality standard. Control strategies contained in State Implementation Plans promulgated in 1991 were responsible for the marked decrease in concentrations observed in the early 1990s. The associated control strategies were phased in through 1995. High monitoring values sometimes result from exceptional events, such as high winds and wildfires. Data collected during exceptional events in 2005 through 2009 have been flagged by the State and are currently under review by EPA. The following graph includes the values influenced by exceptional events.

Figure 8. *PM_{10} Highest 24-hr Concentration*



Standards - $PM_{2.5}$

EPA first established standards for $PM_{2.5}$ in1997, and then revised those standards in December of 2006. It lowered the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3, and retained the current annual $PM_{2.5}$ standard at 15 µg/m^3. Both standards are evaluated by considering monitored data collected during a 3-year period. In this way, the effects of meteorological variability are minimized. For the annual standard, a 3-year average of the annual mean concentrations must not exceed 15 µg/m^3 and no violations in Utah were noted.

The 24-hour standard is met when the average of 98th percentile values collected for each of the three years is less than or equal to 35 µg/m^3. The 98th percentile concentration for each year is selected from all of the data recorded at a given monitor, such that the values of at least 98 percent of all that data were of a lower concentration. Some historical $PM_{2.5}$ data is presented in Figures 9 and 10. Figure 9 presents the 3-year averages of the 98th percentile concentrations at Wasatch front monitors for 2000 – 2009. The following graph shows that Utah was in compliance with the 1997 standard but is not in incompliance under the revised standard.

Figure 9. *$PM_{2.5}$ 3-year Average 98th Percentile 24-hr Concentration*

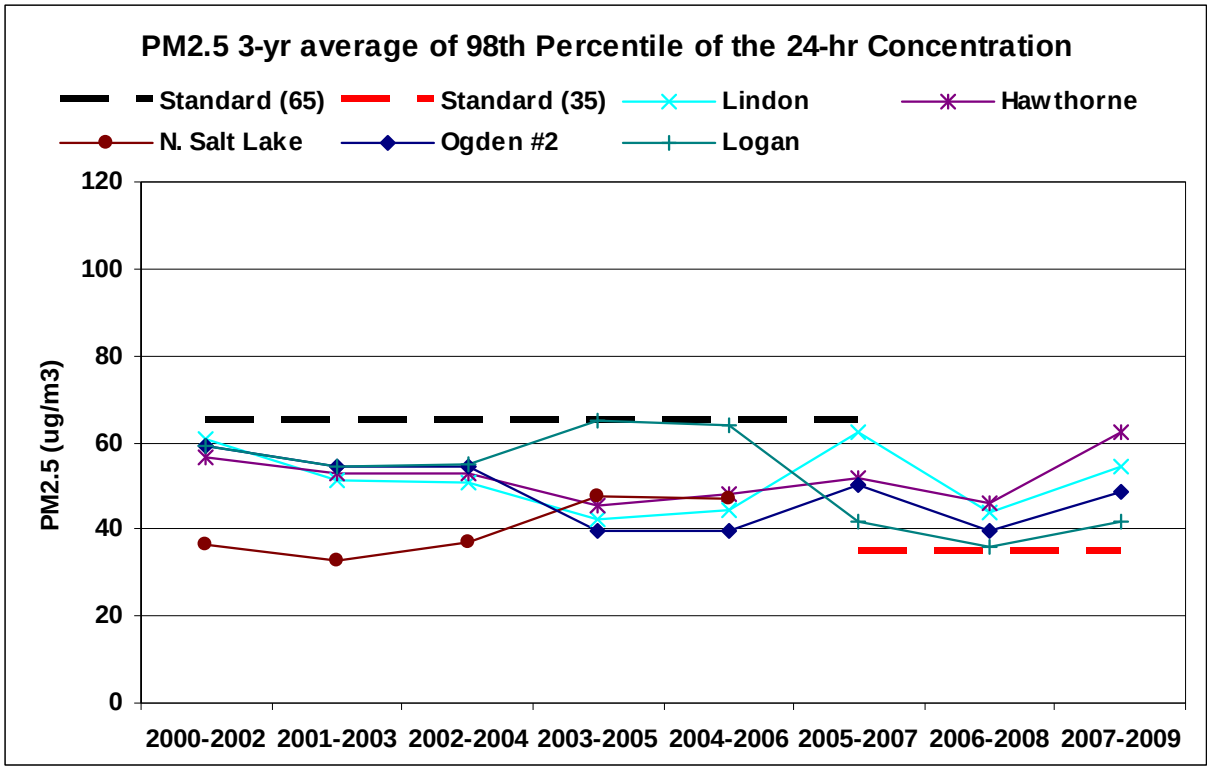
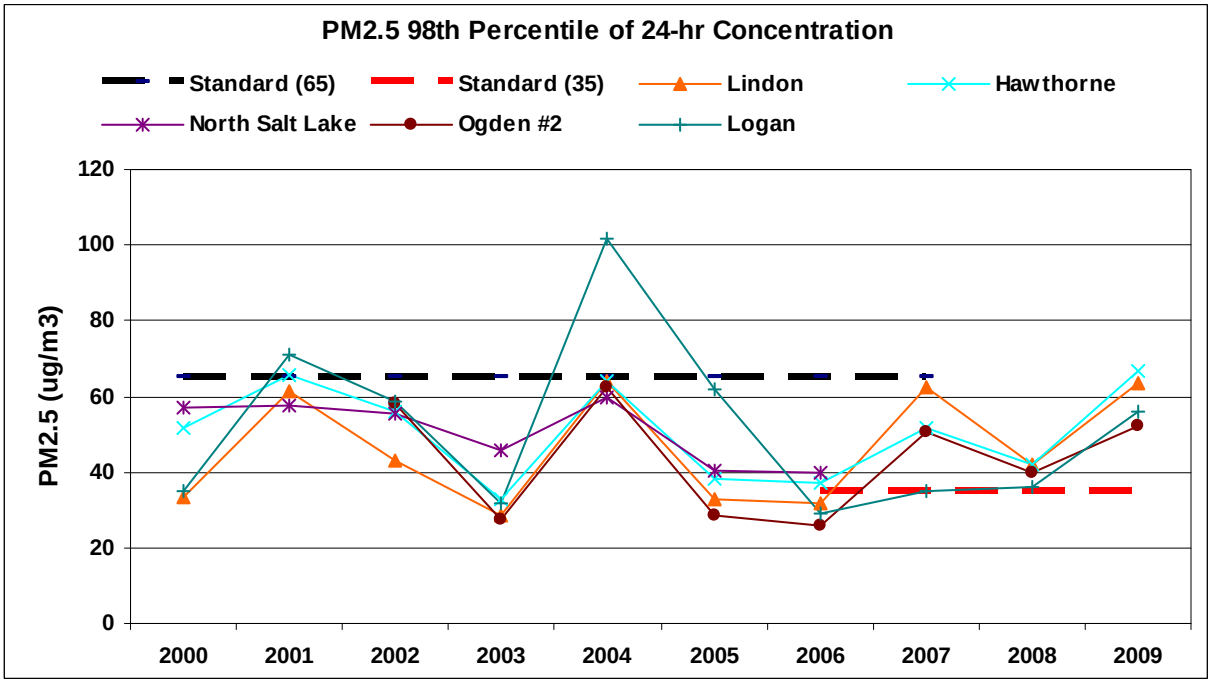


Figure 10 shows the 98th percentile concentrations for discrete years within the period 2000-2009. This illustrates the effect of meteorological variability. In particular, the severity of wintertime temperature inversions has a dramatic effect on $PM_{2.5}$ concentrations collected year to year.

Figure 10. *$PM_{2.5}$ 98th Percentile of 24-hr Concentrations*



Sulfur Dioxide (SO_2)

Sulfur dioxide is a colorless gas with a pungent odor. In the atmosphere, sulfur dioxide is easily converted into sulfates, which are detected as particulates. It is also converted into sulfuric acid, the major acidic component of acid rain. It is emitted primarily from stationary sources that burn fossil fuels (mainly coal and oil) such as power plants and refineries, and is also a byproduct of copper smelting and steel production. Diesel fuel and, to a lesser extent, gasoline contain sulfur and are considered contributors to sulfur dioxide in the atmosphere.

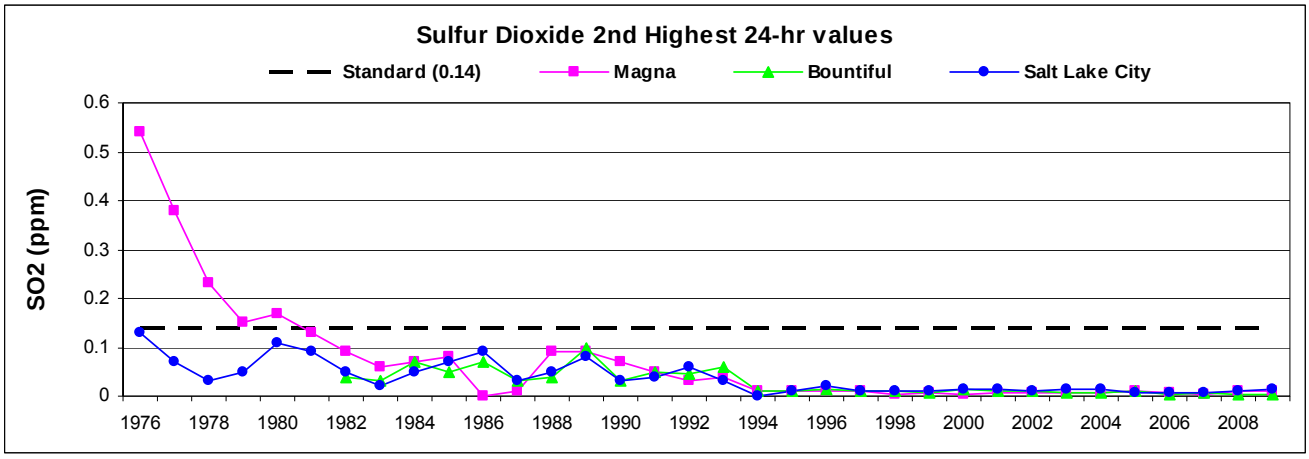
Standards

There are two primary health based NAAQS for SO_2: a 1-year average of 0.03 ppm, and a 24-hour average of 0.14 ppm. In addition, there is a secondary welfare-related standard of 0.50 ppm averaged over a 3-hour period.

The DAQ has situated its monitors near the largest sources of SO_2 (Kennecott Utah Copper and the five refineries along the Wasatch Front). Throughout the 1970s the Magna monitor routinely measured violations of the 24-hour standard. Consequently, all of Salt Lake County and parts of eastern Tooele County above 5600 feet were designated as nonattainment for SO_2. Two significant technological upgrades at the Kennecott smelter have resulted in continued compliance with the SO_2 standard since 1981.

In the mid 1990s, Kennecott, Geneva Steel, the five refineries, and several other large sources of SO_2 made dramatic reductions in emissions as part of an effort to curb concentrations of secondary particulate (sulfates) that were contributing to PM_{10} violations. Utah submitted an SO_2 Maintenance Plan and re-designation request for Salt Lake and Tooele Counties to EPA in April of 2005. Recent measurements of SO_2 indicate that Utah's ambient air is well within the federal health standards. Figure 11 shows the trend in SO_2 concentrations over the past 33 years.

Figure 11. *Sulfur Dioxide 2nd Highest 24-hr Values*



On November 17, 2009, the EPA proposed a new one hour standard for SO_2 between 0.050 and 0.100 ppm and to eliminate the 24 hour and annual primary standards. The SO_2 standard has not changed since 1971. DAQ has initiated a review of the proposed standard range to assess ramifications to Utah.

Emissions Inventories

Every three years, DAQ collects information about the quantity and characteristics of the various air pollutants released by all emission sources in the state. In addition to these triennial inventories, emissions information is also collected annually from the larger industrial sources. Finally, more detailed inventories are prepared as needed for special projects to quantify emissions during specific seasonal air pollution episodes.

Once collected, the inventory information is reviewed, made available to the public, and is quality assured, analyzed, and stored in the DAQ data system. This emissions information is used by DAQ to review trends over time, as data for air quality modeling analyses and as an indicator of the effectiveness of current control strategies. The emissions information is also compiled according to source type to provide billing information for the Title V operating permits program. Both triennial and annual emissions inventory data is uploaded to the EPA's National Emissions Inventory data system. In recent years, Utah has made significant strides toward automating the collection of emissions information from the major industrial sources resulting in more timely and higher quality inventories.

Sources of Air Contaminants

Emission inventories are typically organized into three categories of sources: Point, Area and Mobile.

Point sources are large stationary industrial or commercial facilities such as power plants, steel mills, and manufacturing facilities. Air pollutants released from these stationary sources are accounted for on a facility-by-facility basis.

Area sources are generally much smaller stationary sources, and due to their greater number, are accounted for as category groups. Home heating, agricultural burning and harvesting, construction, residential and commercial energy generation, wildfires, and biogenics (emissions from vegetation) are examples of area source categories.

Mobile sources make up the third category in the inventory, and consist of emissions from non-stationary sources such as cars, trains, and aircraft. Mobile emissions are further broken down into on-road mobile and off-road mobile categories. On-road mobile sources primarily consist of personal and commercial cars and trucks, and contribute by far the largest part of the mobile source emissions. Off-Road Mobile sources consist of a diverse group of heavy construction equipment, small engines (lawnmowers and snow blowers), trains, and aircraft. Estimating emissions from mobile sources requires an understanding of the various emission characteristics of the many types of vehicles and model years that make up the fleet, as well as an understanding of how they are driven and the distances they travel.

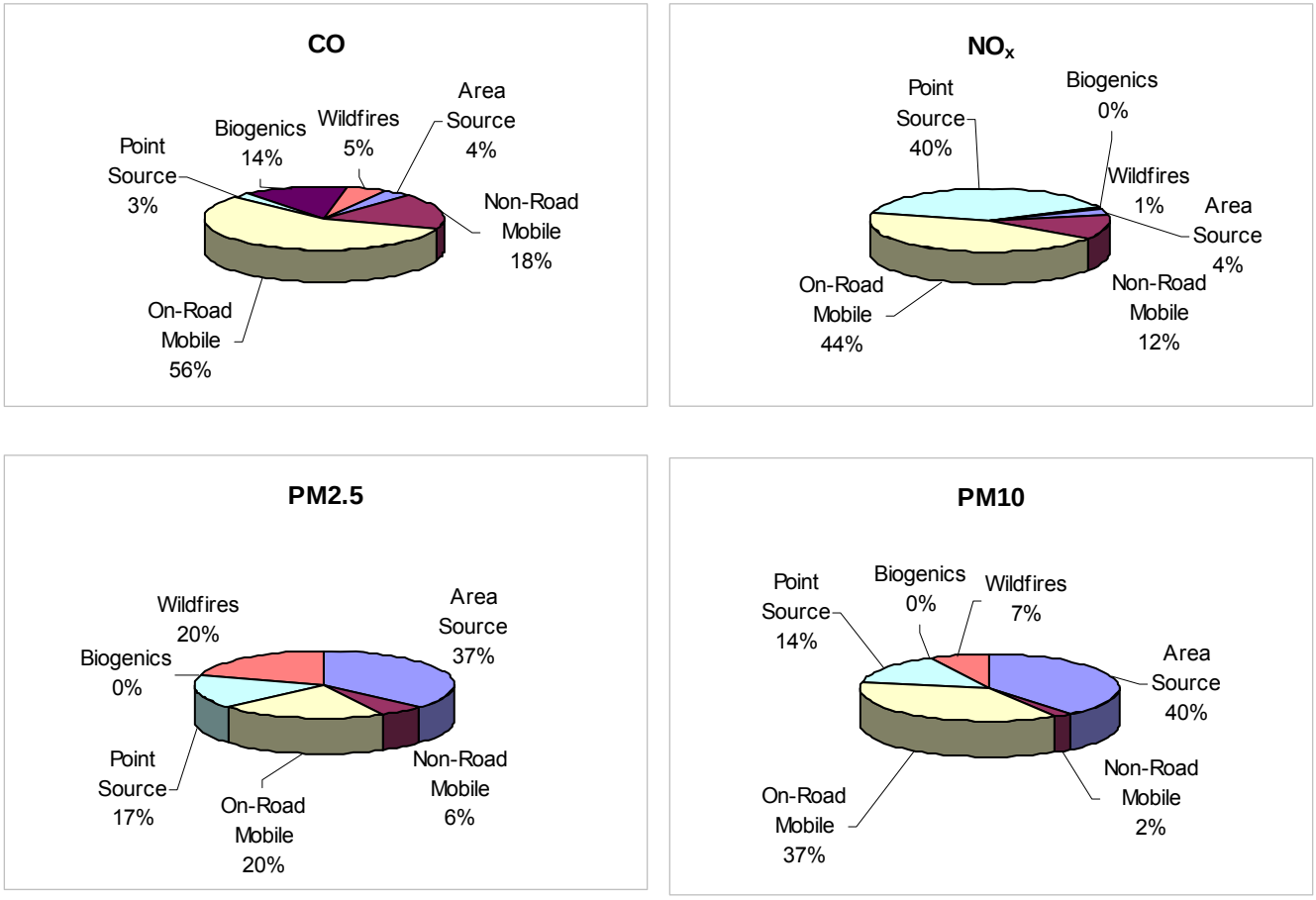
The 2005 triennial inventory is the most recent state-wide inventory available. The triennial inventory covers over 490 individual point sources, 75 area source categories, and 12 non- and on-road source categories. Table 3 shows total emissions, by county, of the criteria pollutants, CO, NOx, PM_{10}, $PM_{2.5}$, SO_X, and VOCs. Figure 12 presents the updated 2005 triennial emissions inventory in six pie charts, displaying the relative portion of emissions generated within source categories. Biogenic and wildfire emissions produced from non-anthropogenic (non-human), natural activity of vegetation and wildfires, are usually estimated

as segments within the area source category but have been listed separately due to their unique nature and impact.

Table 3. *Updated 2005 Triennial Inventory (tons/year)*

County Summary (tons/year)	CO	NOx	PM10	PM2.5	SOx	VOC
Beaver	14,140.85	1,548.95	1,261.86	287.01	97.65	29,856.30
Box Elder	58,487.58	5,617.85	6,234.35	2,455.04	232.95	40,967.55
Cache	30,942.59	4,091.66	3,222.71	979.26	206.78	17,728.39
Carbon	13,475.54	5,999.70	1,333.07	406.87	6,496.54	17,028.67
Daggett	4,980.86	916.81	356.19	168.79	6.40	14,384.07
Davis	65,137.55	10,741.19	3,863.15	1,224.17	3,483.33	18,082.04
Duchesne	13,352.71	1,864.36	1,480.42	432.31	70.25	24,047.90
Emery	19,772.93	30,023.02	3,513.85	1,143.08	23,794.72	32,520.82
Garfield	14,929.66	633.64	1,544.23	457.45	54.77	45,335.82
Grand	18,106.81	1,611.18	851.27	199.93	27.25	36,803.42
Iron	28,229.71	3,269.32	2,090.66	549.61	300.32	40,335.11
Juab	30,783.63	4,756.30	2,225.45	768.17	132.04	29,898.99
Kane	15,181.37	637.35	686.75	154.82	51.86	49,082.62
Millard	29,464.59	27,017.27	3,101.75	831.15	3,774.79	51,371.90
Morgan	6,858.15	3,170.50	662.24	167.92	247.11	10,056.67
Piute	2,935.18	138.24	239.70	57.48	19.30	11,702.78
Rich	4,530.46	244.58	760.30	247.95	26.62	9,430.94
Salt Lake	227,989.10	38,106.41	15,884.38	4,860.04	6,082.17	48,462.82
San Juan	21,925.14	1,625.78	1,601.59	394.68	368.46	65,138.33
Sanpete	12,439.01	1,118.94	1,230.76	272.08	205.67	18,873.54
Sevier	17,046.78	3,423.09	1,503.70	436.17	261.62	19,369.19
Summit	24,339.22	4,162.33	1,906.43	464.27	264.76	20,880.16
Tooele	43,677.25	5,493.79	5,023.30	1,916.38	266.96	44,532.74
Uintah	18,480.17	1,830.25	1,507.70	480.36	80.00	31,026.60
Utah	79,518.09	13,591.55	7,534.82	2,335.60	721.09	36,856.19
Wasatch	10,916.47	1,227.40	837.93	186.45	44.34	18,297.33
Washington	69,699.10	6,287.69	5,947.62	3,580.57	273.09	62,592.20
Wayne	6,557.14	224.39	472.87	87.15	79.05	24,591.51
Weber	48,942.57	6,880.46	3,011.23	940.25	240.22	15,592.18
Total	**952,840.22**	**186,254.00**	**79,890.27**	**26,485.01**	**47,910.10**	**884,846.79**
Portable Sources	*180.78*	*441.61*	*166.36*	*54.45*	*64.49*	*60.18*
Total (plus Portables)	***953,021.00***	***186,695.61***	***80,056.63***	***26,539.46***	***47,974.59***	***884,906.97***

Figure 12. *2005 Triennial Emissions Inventory by Source Category (Direct emissions, annual average)*



Planning Branch

The *Planning Branch* is responsible for developing State Implementation Plans (SIPs) in order to ensure that Utah's ambient air meets the federal health standards, even as our population and our economy continue to grow. These plans address a variety of air quality issues, but most often focus on areas of the state where the monitoring found air quality to be unhealthy for one or more of the criteria pollutants.

In addition, the CAA now requires transportation planning organizations to prepare information detailing the air quality impacts associated with improvements in the transportation infrastructure. These transportation plans must conform to the mobile source emission budgets used by the DAQ to develop the SIPs. Therefore, most of the recent SIP revisions were undertaken with an additional goal of helping transportation planners adapt to an ever-growing population base and updated air quality health standards.

Status of Utah Projects and Initiatives

$PM_{2.5}$

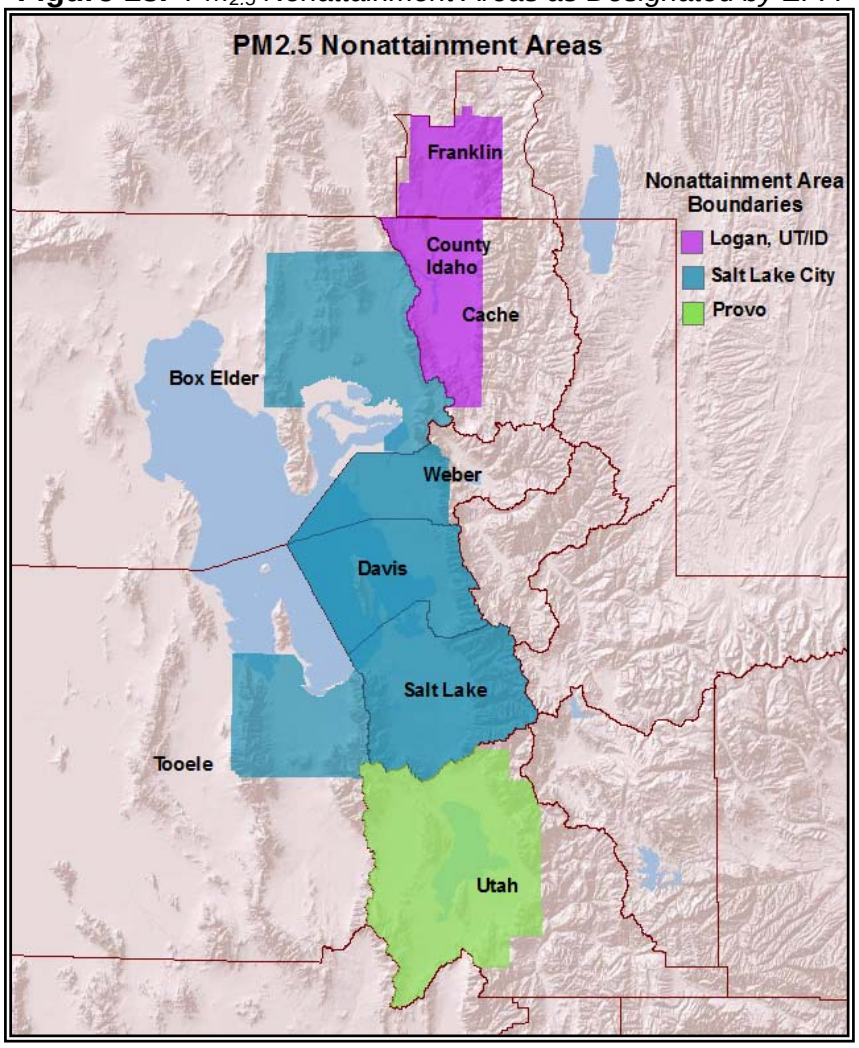
One of the six "criteria" pollutants identified for regulation in the original CAA of 1970 was total suspended particulate (TSP). In 1987, EPA defined an "indicator" of the suspended particles that were of concern to public health. These were particles with an aerodynamic diameter of ten microns or less, and this regulated subset of TSP was called PM_{10}. It includes a complex mixture of extremely small particles and liquid droplets that can be emitted directly, as in smoke from a fire, or it can form in the atmosphere from reactions of "precursor" gases such as sulfur dioxide and ammonia.

Further study of PM_{10} has revealed a bi-modal size distribution. There are typically two distinct groups of PM_{10} particles – those between 2.5 and 10 microns in diameter, and those smaller than 2.5 microns. A growing body of health studies has led to the conclusion that it is the smaller of these particle groups that most severely impacts public health. In response, in 1997, EPA added a new indicator to the regulatory framework for particulate matter. $PM_{2.5}$ is inclusive of particles having an aerodynamic diameter of 2.5 microns or less.

DAQ has monitored $PM_{2.5}$ since 2000, and found that all areas within the state have been in compliance with the 1997 standards. In September of 2006, EPA revised the standards for $PM_{2.5}$. While the annual standard remained unchanged at 15 $\mu g/m^3$, the 24-hr standard was lowered from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. At this new level, all or parts of five counties have collected monitoring data that is not in compliance with the 24-hr standard. This monitoring data, in conjunction with other considerations such as topography, population density, and projected growth estimates has led to the establishment of three nonattainment areas for $PM_{2.5}$ (see Fig. 13). After a substantial delay, the EPA completed the administrative process of designating these areas on December 14, 2009. To address non-compliance, the state will have to prepare comprehensive plans to meet the revised standards in these areas within three years of EPA's final action. The monitoring data DAQ has been collecting since 2000 suggests that meeting this new standard will be one of our greatest challenges.

During this past year, DAQ has been laying the technical groundwork for the $PM_{2.5}$ State Implementation Plans that will be prepared for the non-attaining areas in the state. Specialized computer hardware needed to run the atmospheric models specified by EPA has been installed and tested. The extensive amount of meteorological data needed to run the model has been collected in cooperation with Dugway Proving Ground. Other agencies including the Governor's Office of Planning and Budget, and the various Metropolitan Planning Organizations (MPOs: Mountainland Association of Governments, the Wasatch Front Regional Council, and the Cache MPO) have assisted DAQ in compiling the necessary emissions data to run the model. Several historical episodes of high $PM_{2.5}$ concentrations have been identified to test the model and validate performance against observed air quality data. Looking forward to 2010, DAQ expects to continue this work in support of the SIPs that will be due to EPA in 2012.

Figure 13. *$PM_{2.5}$ Nonattainment Areas as Designated by EPA*



Community and Neighborhood Health

The Division of Air Quality, in conjunction with local health departments and local governments participated in air quality assessments, public meetings, and health assessments in communities and neighborhoods throughout the state. These types of activities are usually in response to concerns raised by neighbors to industrial areas or other sources of air pollution. Community scale investigations include a review of the compliance status of the sources of air pollution including any emission testing and reporting required by applicable permits. In some cases, further assessments include additional targeted air monitoring correlated with observations logged by neighboring residents and evaluation of health statistics by the Utah Department of Health. Findings are presented at public meetings and, in cases where there is general interest; informational web pages are developed to provide a repository for information.

Community investigations in 2009 included work in the following areas:

- West Bountiful City (Trinity Highway Safety Products)
- North Salt Lake (Stericycle Medical Waste Incinerator and Refineries)

- Salt Lake City (Beck Street Sand and Gravel operations)
- Washington County (Sand, Gravel and Construction activities and support for the Southern Utah Air Quality Task Force)
- Underground uranium mines and milling.

And finally, DAQ assisted in the sitting of two EPA monitoring stations on Indian lands in the Uinta Basin. The stations monitor meteorological conditions, real time $PM_{2.5}$, ozone and NO_2.

Utah Clean School Bus Project

In 2007, the DAQ started the Utah Clean School Bus Project in conjunction with Utah Office of Education, local school districts, county and municipal governments, as well as community and non-profit organizations. This coalition is working together to secure funding sources for school districts to purchase emission reducing technologies for buses statewide.

Retrofits are aftermarket vehicle additions that help reduce harmful pollutants found in the bus cabin and in tailpipe emissions. The selected technologies are efficient, easy to install, and cost effective. Based on analyses, recommendations, and cost effectiveness, the DAQ is recommending the use of Diesel Oxidation Catalyst and Closed Crank Ventilation systems for this project. More information about these technologies can be found on the following website:

http://www.epa.gov/cleanschoolbus/retrofit.htm

The application of these technologies is expected to reduce particulate matter by 30%, carbon monoxide by 50% and VOCs (hydrocarbons) by 74%. Based on initial analysis, the cost per bus is $2,025. The total projected statewide cost for the project is $3,500,000.

Several sources of funding have been secured for the project. These include money from the Clean School Bus Project USA and the Clean Fuel Vehicles Grant and Loan Program, funds from the Utah Department of Environmental Quality (UDEQ) as appropriated by House Bill 146 (2008) and money from the Congestion Mitigation Air Quality fund. We also received $55,000 from companies found in violation of air quality rules which will be used as matching funds for this project. In addition, Utah Department of Environmental Quality received funding through the American Recovery and Reinvestment Act (ARRA).

Utah's Clean School Bus Retrofit Project is underway. The overall project is divided into several phases. Each phase focuses on a particular geographic area of the state. Depending on current funding levels, some phases may run concurrently.

The first phase was in the Southwest area of the state and involved the Beaver, Garfield, Iron, Kane, Millard, Piute, Sevier, South Sanpete, Washington, and Wayne school districts. In addition, buses from the Murray School District were included. This phase was completed during 2009 with a total of 247 retrofitted buses.

The second phase involves the Alpine, Nebo, and Provo school districts in Utah County and is nearing completion. A total of 340 buses are expected to be retrofitted during this phase.

The Box Elder County School District was part of the third phase and has been completed with 78 retrofitted buses. The Morgan, North Summit, South Summit, and Ogden districts are also nearing completion of their 66 installations.

The newly formed Canyons School District began retrofitting buses in December. The Jordan School District will follow early 2010 with both Granite and Salt Lake City beginning shortly after. All Salt Lake County districts are expected to be finished by September 2010 and will total 454 buses.

The Daggett, Granite, Juab, Jordan, North Sanpete, Rich, Salt Lake City, Tintic, Tooele Wasatch, Weber and Uintah school districts are scheduled to be completed by September of 2010.

Clean Diesel for Agriculture Project

UDAQ applied for and received $750,000 from the ARRA to replace 11 agricultural vehicles and equipment, repower 21 engines in agricultural vehicles and equipment, and install 30 auxiliary power units on agricultural vehicles. UDAQ collaborated with the Utah Department of Agriculture and Food and Utah State University to identify agricultural operators whose operations are negatively impacting non-attainment areas in the state. The project's scope of replacing, repowering and installing more fuel efficient technology on agricultural vehicles and equipment will insure that stricter emissions standards requirements are met and yield more diesel fuel conservation.

Grant and Loan Program

The Utah Clean Fuels and Vehicle Technology Grant and Loan Program, funded through the Clean Fuels and Vehicle Technology Fund, provides grants to assist businesses and government entities in covering:

1) The cost of converting a vehicle to operate on clean fuels.

2) The incremental cost of purchasing an Original Equipment Manufacturer (OEM) clean fuel vehicle.

3) The cost of retrofitting diesel vehicles with EPA verified closed crankcase filtration devices, diesel oxidation catalysts, and/or diesel particulate filters.

The Clean-Fuels Grant and Loan Program also provides loans for the cost of converting a vehicle to operate on a clean fuel, for the purchase of OEM clean fuel vehicle, and for the purchase of fueling equipment for public/private sector business and government vehicles. Finally, the program can provide grants and loans to serve as matching funds for federal and non-federal grants for the purpose of converting vehicles to operate on a clean fuel, purchasing OEM clean fuel vehicles, or retrofitting diesel vehicles.

DAQ received applications from 16 different entities and 22 different projects statewide. DAQ was able to fund 11 projects ranging from converting police vehicles and refuse trucks to building a new compressed natural gas (CNG) refueling station. Annually, a total of $250,000 -

$500,000 for grants and $250,000 for loans - will be available to help cover the cost of converting a vehicle to operate on clean fuel, for the purchase of OEM clean fuel vehicle, retrofitting diesel vehicles and for the purchase of fueling equipment for public/private sector business and government vehicles.

The Clean Fuels Grant and Loan Program began accepting application on October 15, 2009. DAQ plans on awarding money by spring 2010.

Utah Asthma Task Force

The Utah Asthma Task Force is a State of Utah initiative to develop a multi-agency task force to address the problem of asthma in Utah. The task force convened in March of 2002 and released a State of Utah Asthma Plan in September of 2003. The task force meets quarterly and has a number of projects currently underway in addition to the programs initiated under the State Plan. The task force issued an update of the Asthma Plan in 2007. The Risk Factors Action Group, one of several action groups created by the task force, is comprised of air quality experts, school officials, and health care professionals. Work performed by the Risk Factors Action Group has led to guidance for school districts in Cache County and along the Wasatch Front regarding when it would be recommended that accommodation be made for indoor recess on bad pollution days. It is anticipated that this guidance will help reduce confusion for students, parents, and schools on the appropriate action to take during high pollution events. The guidance is keyed to current air pollution levels reported on the Utah Division of Air Quality's web page. Over the last year, the Utah Asthma Task Force developed air quality indicators for the Indicator Based Information System authorized and funded by the Center for Disease Control. Similar participation is ongoing in development of the Environmental Public Health Tracking System.

In 2009, the Task Force published *Recommendations for Outdoor Physical Activity During Ozone Season*. The recommendations were developed by scientists and staff from the DAQ and Environmental Response and Remediation (DEQ) together with those from the Department of Health and public stakeholders. The recommendations were placed on the Department of Health Asthma web sight this year and will be available to the public each year during the June - September ozone season.

Mercury

Although mercury is a naturally occurring metal, it is a neurotoxin that easily penetrates the brain and central nervous system. It can also become toxic when biochemical processes transform it into methylmercury. Methylmercury builds up in the food chain, accumulating in muscle tissue and putting people and wildlife at risk. The most common pathway to human exposure is consumption of contaminated food; most typically this contamination occurs in fish. Fish collected from several of Utah's waterways in 2007 were found to have elevated levels of mercury. In an effort to understand how much of that mercury may have come through airborne transport, DAQ acquired a wet-deposition monitor to evaluate the amount of mercury that is deposited via rain or snow in Utah. Dry-deposition mercury monitoring was initiated in 2008 at one monitoring station to attempt to identify the amount of mercury that is deposited during dry weather. The dry-deposition monitor was installed in September 2008 and will continue to provide data in 2010.

The State has issued specific consumption advisories for both fish and waterfowl. Current information concerning these advisories may be found online at http://www.mercury.utah.gov/.

Mercury emissions are a global problem. The US presently accounts for only 3% of global mercury emissions and of the total deposition in the US in 2001, 84% was due to sources outside of the US and Canada. Much of the global contamination ends up in the oceans, where it finds its way into the food chain.

Coal fired power plants are the largest remaining source of mercury emissions in the US. Other sources include gold mines, hazardous waste incinerators, medical waste incinerators, and salvage operations that dispose of mercury switches in cars.

In order to address mercury emissions from coal-fired power plants, EPA issued the Clean Air Mercury Rule (CAMR) on May 18, 2005. The Rule applied to coal-fired electrical generating units (EGUs) that were larger than 25 megawatts, setting nation-wide caps of 38 tons/yr in 2010 and 15 tons/yr in 2018 and beyond. Each state was allocated a cap total for each phase of the program. The rule allowed states to adopt plans appropriate to their circumstances.

To comply with the CAMR, Utah wrote a *Designated Facilities Plan* and a number of other rules in the spring of 2007. Utah also implemented restrictions on mercury emissions from coal-fired EGUs that go beyond what was required by the CAMR. In February of 2008, the D.C. Circuit Court of Appeals vacated the CAMR, and it is now up to the EPA to develop a new rule regarding mercury emissions from power plants. Utah will look to see what action EPA ultimately takes and revise its rules accordingly.

DAQ is also represented on the Statewide Mercury Work Group, a task force representing industry, government, and advocacy groups that was organized to assess the extent of mercury contamination in Utah and set priorities for protecting the public.

Regional Haze SIP

Utah's Regional Haze Plan includes a regional backstop trading program for SO_2. Each year the four states participating in the program compile an inventory of SO_2 emissions, and then compare the emissions to the milestones established in the plan. The regional emissions in 2007 were 280,279 tons; 34% below the milestone. The emissions are far below the milestone due to the early installation of emission controls at power plants and other emission sources, as well as the permanent closure of Geneva Steel in Utah and several copper smelters in the region. Beginning in 2008, the more stringent milestones included in the 2008 revision to Utah's Regional Haze Plan will apply. The 2008 milestone report will be completed March 2010.

Transportation Conformity

Several Metropolitan Planning Organizations (MPO's) are responsible for developing, producing, and adopting the Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) for the state of Utah. These include Cache, Dixie, Mountainland Association of Governments (MAG), and the Wasatch Front Regional Council (WFRC). MPO's located in nonattainment and/or maintenance areas have the responsibility to ensure

that the current RTP and TIP conform to the Utah SIP. The Federal Highway Administration and Federal Transit Administration review the conformity determinations along with the RTP and TIP in consultation with EPA to ensure that the relevant planning regulations have been adequately addressed.

During 2008-09, MAG and WFRC demonstrated conformity to the SIP. In September 2008 the MAG established conformity for the amended 2007-2030 RTP and 2007-2011 TIP for the Provo\Orem City carbon monoxide maintenance area and the Utah County PM_{10} nonattainment area. In November 2009, the WFRC established conformity for the amended 2030 RTP and the 2009-2014 TIP for the Salt Lake City carbon monoxide maintenance area, the Ogden City carbon monoxide maintenance area and PM_{10} nonattainment area, and the Salt Lake County PM_{10} nonattainment area. In the summer of 2010, WFRC plans to update the TIP (2011-2016) and demonstrate conformity to the SIP.

On November 13, 2009, EPA designated all or portions of the following counties as nonattainment for the 2006 24-hour $PM_{2.5}$ standard (35 µg/m3): Logan, Utah, Box Elder, Davis, Salt Lake, Tooele, and Weber. The Cache, MAG, and WFRC MPO's will be required to demonstrate conformity after December 14, 2010. Specific conformity guidance will be published in early 2010.

Stage I Vapor Recovery

Stage I vapor recovery systems collect vapors resulting from the dispensing of gasoline to both aboveground and underground storage tanks. Stage I vapor recovery requirements were implemented in Salt Lake and Davis Counties in the 1980's and in Utah and Weber Counties in 1999. They have proven to be a successful method of controlling both VOCs and HAPs emissions along the Wasatch Front.

In June 2008 DAQ held a series of public meetings throughout the state to present information regarding Stage I vapor recovery technology and to take comments from the public. In September 2008, the Air Quality Board adopted changes to the Gasoline Transfer and Storage rule (R307-328) which extended Stage I vapor recovery statewide. The program is running on schedule to be completely phased in by 2011.

Utah's Clean Diesel Trucking Initiative

The "Crossroads of the West" for freight traffic, Utah provides major transportation arteries for distribution coast to coast and between Canada and Mexico. Interstate 15, 80, 84, and 70 and other freight routes provide connections to Utah's central railroad network and create an inter-modal hub for warehousing and distribution in the Western United States. The Salt Lake International Airport, Union Pacific Railroad, and thousands of distribution centers and terminals in which over 19,000 Utah-based carriers operate, create a high presence of freight distribution and are reasons Utah is home to the country's largest trucking companies, carriers, and suppliers.

The trucking industry is one of many industries that contribute to air quality. In its efforts to reduce harmful diesel emissions, the DAQ is working together with the Utah Trucking Association to encourage the use of diesel-emission-reduction technologies within the trucking industry.

In December 2009, the DAQ submitted a grant proposal for $2.9 million to the EPA National Clean Diesel Campaign. The proposal included a diverse group of projects that would reduce diesel emissions and fuel usage from diesel-powered vehicles that travel and idle within the non-attainment areas of the Wasatch Front. The proposed projects involve:

- Installing auxiliary power units (APU) on 46 long-haul tractors.
- Installing APUs with diesel particulate filters on 21 long-haul tractors.
- Installing APUs in combination with aerodynamic kits on 11 long-haul tractor/trailers.
- Installing APUs in combination with low-rolling resistance tires on 13 long-haul tractor/trailers.
- Installing low-rolling resistance tires on four long-haul tractor/trailers.
- Installing aerodynamic kits in combination with low-rolling resistance tires on eight long-haul tractor/trailers.
- Installing aerodynamic kits on four long-haul tractor/trailers.
- Repowering two long-haul tractors with current model year EPA certified engines.
- Repowering nine delivery trucks and three refuse haulers with EPA certified CNG engines.
- Repowering three tankers with EPA certified liquid CNG engines and replacing five long-haul tractors.

Awards from the National Clean Diesel Campaign will be announced toward the end of February, 2010. In the interim, the DAQ will begin diesel-emission-reduction projects through the State Clean Diesel Grant Program that will include the installation of an APU on 48 long-haul tractors. The funding is provided by a state allocation of $352,941 through EPA's National Clean Diesel Campaign and a state match of $235,294, for a total of $588,235.

Ancillary Programs

Air quality programs and information outreach programs which have their roots in the air quality plans developed at DAQ include the following.

Utah Air Quality Public Notifications

In response to the changes in $PM_{2.5}$ air quality standards and to improve the presentation of air quality information to the public, DAQ has updated its air quality forecasting webpage. The web page now shows the air quality forecast for today and the next two days. The Air Monitoring Center (AMC) provides air pollution information based on daily air quality status. The AMC data is used to determine the relationship of existing pollutant concentrations to the National Ambient Air Quality Standards. There is a three tiered air quality alert system: Green, Yellow (alert days), and Red (actions days) that is used to implement winter and summer controls on the use of wood and coal burning stoves, fire places, and motor vehicles. There are five health advisory categories: good, moderate, unhealthy advisories A and B, and very unhealthy. The AMC advisory is calculated for five major pollutants including ground-level ozone, particulate pollution (particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. The new index now also incorporates recommendations for actions to take on days when concentrations are in the red zone, to mitigate the effects of pollution for affected groups and recommendations for industry and citizens that help reduce pollution levels. The outreach program information consolidated in the three day forecast includes the Summer and Winter Control Programs and Choose Clean Air information.

Choose Clean Air
An interactive source of information about ways individuals can help improve air quality by making smart choices in their personal lives. The UDEQ is also sponsoring an electronic mail server (Listserv). Subscribers are automatically notified by e-mail when unhealthy air pollution levels are forecast for the Wasatch Front.

Winter Control Program (red-burn / green-burn)
This program originated with the PM_{10} SIP. The program runs annually from November through early March. In addition to the burning restrictions, residents are encouraged to drive less and industry is encouraged to optimize operating conditions.

Summer Control Program (red, yellow and green)
These are announced whenever the probability of exceeding the ozone standard is forecast to be high. High temperature and stagnant air masses contribute to this probability. Residents are encouraged to minimize driving whenever the ozone or PM standards are approached.

Vehicle Inspection/Maintenance Programs
Although not run directly by DAQ, the emissions portions of these programs were instituted because of past problems in attaining the federal health standards for several pollutants; most notably CO and ozone. Implementation of these programs was critical to attaining the federal standards, and their continued operation is necessary for the Wasatch Front to remain in attainment of these standards. These programs are administered by the county health departments.

Smoking Vehicles
Vehicles emitting excessive smoke contribute to poor air quality. To promote clean air, several local health departments operate smoking vehicle education and notification programs. People who spot a vehicle producing excessive smoke can report it through their respective county health department:

Cache County	435-792-6611
Davis County	801-546-8860
Salt Lake County	801-944-SMOG(7664)
Utah County	801-851-SMOG(7664)
Weber County	801-399-7140

Permitting Branch

The DAQ Permitting Branch is responsible to ensure that air quality is not significantly degraded by any new or modified stationary source that emits air contaminants by issuing permits. Permits are legally enforceable documents that specify construction limitations, emission limits, and how the emissions source must be operated. Permit limits can be actual emissions or surrogate limits such as production rates, hours of operation, fuel consumption or a combination thereof. Opacity, the transparency of emission plumes, is also a common metric used to both limit and measure source emissions.

The branch issues two types of permits. New Source Review (NSR) permits, also known as Approval Orders, are pre-construction permits for new and modified sources of air emissions. These are issued by the New Source Review Sections and have been required

since 1969. The Operating Permits Section issues the Title V Operating Permits to the larger "major" stationary sources in the state, as required in Title V of the Federal Clean Air Act. There are approximately 100 of these sources. Operating permits consolidate all air quality related requirements from numerous federal air quality programs into a single regulatory document. The purpose of an operating permit is to clarify for the permit holder as well as DAQ compliance inspectors the wide range of requirements for any regulated source in one consolidated document.

In addition, the branch processes a number of smaller actions such as de minimus determinations for NSR, name changes, tax exemption certificates for pollution control equipment purchases, and soil aeration approvals.

New Source Review

Any new or modified source of air pollution in Utah is required to obtain an Approval Order (AO) before it is allowed to begin construction. For nonattainment areas that are not in compliance with the NAAQS, NSR insures that air quality is not further degraded from the existing levels by new emission sources. In areas that are in compliance with the NAAQS, NSR insures that new emissions do not significantly worsen air quality.

The application for an AO, called a notice of intent (NOI), is reviewed to make sure that the source will install state-of-the-art emission controls. For nonattainment areas, state-of-the-art technology is known as lowest achievable emissions rate (LAER). For areas in attainment of the NAAQS, state-of-the-art controls are known as the best available control technology (BACT). Both LAER and BACT are case-by-case determinations of control technology for a specific source. BACT takes into account both the cost and environmental benefits of the control equipment while LAER technology takes into account only environmental benefits.

The general public and EPA are given an opportunity to review the proposed approval order before it is issued. The criteria indicating which sources must obtain an approval order are specified in the Utah Air Quality Rules. Potential applicants are encouraged to contact DAQ prior to submitting the necessary paperwork. In fiscal year 2009 (7/1/08 to 6/30/09), the NSR section completed or was working on 393 different projects. This included the completion of 155 AO's and 238 other projects.

Operating Permits

Congress created Title V of the Clean Air Act in 1990. This Title requires States to issue an operating permit to the larger or "major" sources of air pollution within the state. Utah developed and submitted a program in 1994 and received approval from the EPA in 1995. Operating permits are legally enforceable documents issued to air pollution sources after the source has begun to operate. As stated above, a primary purpose of the permit is to consolidate the applicable requirements from the many and varied air quality programs such as NSR, federal NSPS and NESHAP, and Maximum Available Control Technology (MACT). Like the approval orders, the general public is given an opportunity to review the draft operating permits before they are issued. In addition, the EPA has up to 45 days to review the proposed operating permit. The criteria indicating which sources must obtain an operating permit are specified in R307-415 of the Utah Administrative Code (UAC). As with the NSR

permit or AOs, potential applicants are encouraged to contact DAQ prior to submitting the necessary paperwork.

Another significant objective of the Title V program is to shift the compliance liability from the regulating agency to the permitted source. Each year the source must certify that it is in compliance with all permit terms and conditions, or indicate non-compliance issues. False reports have criminal implications, beyond the civil liabilities of other violations. In addition, sources must report the results of monitoring at least every six months. Permit provisions for monitoring, record keeping, and reporting are added or enhanced to assure compliance with the permit conditions and limits.

During the last calendar year the Operating Permits section issued permit modifications, coordinating extensively with the NSR Section. The Operating Permit has a life of only five years (as opposed to the AO that does not expire), and in 2009 the section issued several permit renewals. These renewal permits are complex, and care must be taken to ensure that new federal requirements for the Compliance Assurance Monitoring Rule (CAM) and any other new requirements (such as new MACT Standards) are included.

Compliance Branch

The *Major Source Compliance Section*, *Minor Source Compliance Section*, and the *Air Toxics, Lead-Based Paint, Asbestos and Small Business Environmental Assistance* (ATLAS) Sections are responsible for ensuring that all regulatory requirements are met. This is done through inspections, emission testing, and review of periodic reports from industry and enforcement.

Inspection and Enforcement

DAQ regulates more than 2,000 facilities within the state through approval orders, state rules, and federal emission standards. Annual inspections encourage these facilities to maintain continuous compliance with the rules and permit conditions. Possible enforcement actions, which may lead to financial penalties or additional regulatory requirements, provide incentive for source operators to see that all regulatory conditions are met. Inspectors in the Major/Minor Source Compliance Sections and the ATLAS Section conducted 978 inspections in 2009. They also respond to about 250 complaints each year and frequently conduct drive-by observations of visible emissions.

A warning letter is typically sent to sources to document noncompliance with a minor state regulatory requirement. Warning letters are usually reserved for first-time offenders with minor infractions. A Compliance Advisory Notice is sent to sources that appear to be out of compliance with state regulatory requirements and provides an opportunity for the Division and the regulated source to discuss the findings of the inspection. If a source is issued a Compliance Advisory Notice and responds by promptly returning to compliance, a reduced penalty may be offered for their expedient cooperation. Should enforcement actions become necessary, the DAQ may issue an Early Settlement Agreement with penalty, or a Notice of Violation (NOV) with an Order to Comply. Early settlement agreements provide incentive for regulated sources to address these issues in a timely manner. NOVs are used whenever there are significant violations of the rules or permit conditions and the violator may be fined as much as $10,000 per day per violation. Most NOVs are resolved with a settlement agreement

between the Executive Secretary and the regulated source which saves time and court costs. Settlements may also include Supplemental Environmental Projects (SEPs). SEPs are environmentally beneficial projects that the regulated source agrees to undertake as a way to offset some, or all, of the civil penalty.

A Source Compliance Advisory Notice (SCAN) is typically sent to sources that appear to be out of compliance with state regulatory requirements and provides an opportunity for the Division and the regulated source to discuss the findings of the inspection. If the source is issued a SCAN and responds with prompt compliance, a reduced penalty may be offered for expedient cooperation. Should enforcement actions become necessary, the DAQ may issue a Warning Letter, an Early Settlement Agreement, or a Notice of Violation (NOV) with an Order to Comply. Warning Letters are usually reserved for first-time offenders with minor infractions. Early Settlement Agreements provide incentive for regulated sources to address these issues in a timely manner. NOVs are used whenever there are significant violations of the rules or permit conditions and the violator may be fined as much as $10,000 per day per violation. Most NOVs are resolved with a Settlement Agreement between the Executive Secretary and the regulated source which saves time and court costs. Settlements may also include Supplemental Environmental Projects (SEPs). SEPs are environmentally beneficial projects that the regulated source agrees to undertake as a way to offset some, or all, of the civil penalty.

Stack Test Audits

Regulated sources are required to conduct periodic stack tests in order to verify that their facilities are operating properly. Some of the largest sources maintain continuous emissions monitors that record real-time emission rates and concentrations around the clock. In either case, DAQ personnel will audit the records and reports to ensure that the testing was done in accordance with EPA reference methods.

2009 Compliance Summary

TASK	2009
Annual Inspections completed	451
On-site Stack Test/CEM Audits	135
Stack Test/CEM Reviews	485
Temporary Relocations Accepted	103
Fugitive Dust Control Plans Accepted	53
Miscellaneous Inspections	73
Complaints Received	149
VOC Inspections	73
Warning Letters	16
Notices of Violations	3
Compliance Advisories	65
Settlements	30
Total Inspections	**712**
Penalties Assessed	$537,544.02

Air Toxics, Lead-Based Paint, Asbestos, and Small Business Environmental Assistance Section

The ATLAS Section determines compliance with specific regulations involving asbestos, lead-based paint, and area sources of air pollutants that are not required to have a DAQ Approval Order but are subject to Maximum Achievable Control Technology (MACT), Title 40 Code of Federal Regulations (40 CFR) Part 63 (Utah Administrative Code (UAC) R307-214-2) requirements.

The following programs are the responsibility of the ATLAS Section.

National Emission Standards for Area Source Categories
Sources that are required to comply with 40 CFR Part 63 Subpart M *National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities MACT* or the 40 CFR Part 63 Subpart N *National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks MACT* and are not required to have a DAQ Approval Order are inspected by the ATLAS Section.

Lead-Based Paint
Toxic Substances Control Act (TSCA) Title IV, 40 CFR Part 745 (UAC R307-840). Under this program, ATLAS deals with the accreditation of training programs, certification of individuals and firms, work practices for lead-based paint activities, and lead-based paint outreach activities.

Asbestos in Schools
TSCA Title II Asbestos Hazard Emergency Response Act (AHERA), 40 CFR Part 763 (UAC R307-801-4). Under this program, ATLAS deals with the approval of training providers, certification of individuals and companies, inspections of school buildings, and inspections of asbestos abatement in schools.

Asbestos NESHAP and State asbestos work practices
40 CFR Part 61, Subpart M (UAC R307-214-1) and UAC R307-801. Under this program, ATLAS deals with the certification of individuals and companies, review of asbestos project notification forms, review of demolition notification forms for structures, review of alternate work practices, inspection of asbestos abatement projects, demolition of structures, and asbestos outreach activities.

2009 ATLAS Activity Summary

TASK	2009
MACT Inspections	44
Other NESHAP Inspections	1
Asbestos Demolition/Renovations Inspections	104
Asbestos in School Inspections	71
Asbestos State Rules (Only) Inspections	8
Asbestos Notifications Accepted	1158
Asbestos Phone Calls	3952
Asbestos Individual Certifications	1058
Asbestos Company Certifications	113
Asbestos Alternate Work Practices	38
Lead Based Paint Inspections	38
Lead Based Paint Notifications	21
Lead Based Paint Phone Calls	543
Lead Based Paint Letters Prepared & Mailed	483
Lead Based Paint Courses Reviewed	18
Lead Based Paint Course Audit	97
Lead Based Paint Individual Certifications	127
Lead Based Paint Company Certifications	19
Small Business Phone Calls (N/A as of 2/09)	16
NOV's	1
Compliance Advisories	59
SCANS/Warning Letters	65
Settlement Agreements	13
Penalties collected	$31,999.02
Total Inspections	**266**

Small Business Environmental Assistance Program

The Small Business Environmental Assistance Program (SBEAP) helps small businesses understand and comply with state air quality rules. The SBEAP provides “plain language” educational information to help small sources learn about the many air quality requirements. The SBEAP also provides on-site assistance with process evaluation, compliance assistance, and pollution prevention techniques.

The SBEAP works with and incorporates advice of a Small Business Ombudsman and a Small Business Compliance Advisory Panel (CAP). The CAP is appointed by the Governor and the Legislature and is required by the federal Clean Air Act. The CAP provides feedback to the SBEAP regarding program effectiveness. SBEAP services are designed to provide education

to small businesses outside of the regulatory environment. All SBEAP services are free of charge. A toll-free telephone hotline number (1-800-270-4440) provides access to SBEAP services 24 hours a day/seven days a week.

2009 SBEAP Activity Summary

TASK	2009
Phone Calls	59
Email	20
Site Visits	1
Mailed Items	107
Workshops	0

Outreach

The DAQ provides access to all plans, rules, and permits currently open for public comment, lists training workshops available to assist industry to understand permitting and compliance issues, provides Air Quality Board minutes and information, and also provides access to all Air Quality Permitting and Compliance forms. Citizens in the State of Utah and sources of air pollution are assisted by DAQ staff based on assigned responsibilities. Each year, thousands of businesses are assisted, questions are answered and tasks completed through the assistance of knowledgeable DAQ staff.

Appendix 1 – Acronyms

AO – Approval Order
AHERA – Asbestos Hazard Emergency Response Act
ATLAS – Air Toxics, Lead-Based Paint, Asbestos and Small Business Environmental Assistance Section
AMC – Air Monitoring Center
BACT – Best Available Control Technology
CAA – Clean Air Act
CAM – Compliance Assurance Monitoring
CAP – Compliance Advisory Panel
CFR – Code of Federal Regulations
CO – Carbon Monoxide
CNG – Compressed Natural Gas
Criteria Pollutants - Pollutants for which EPA sets standards to protect public health
DAQ – Division of Air Quality
DEQ – Department of Environmental Quality
EPA – Environmental Protection Agency
HAPs – Hazardous Air Pollutants
KUCC – Kennecott Utah Copper Corporation
MACT – Maximum Available Control Technology
MPO – Metropolitan Planning Organization
$\mu g/m^3$ – Micrograms per cubic meter
Micron – One millionth of a meter
NAAQS – National Ambient Air Quality Standards
NESHAP – National Emissions Standards for Hazardous Air Pollutants
NOI – Notice of Intent
NO_2 – Nitrogen Dioxide
NOV – Notice of Violation
NO_x – Nitrogen Oxides
NSPS – New Source Performance Standard
NSR – New Source Review
O_3 - Ozone
PM – Particulate Matter
PM_{10} – Particulate matter smaller than 10 microns in diameter
$PM_{2.5}$ – Particulate matter smaller than 2.5 microns in diameter
ppm – Parts per million
SBEAP – Small Business Environmental Assistance Program
SCAN – Source Compliance Action Notice
SIP – State Implementation Plan
SO_2 – Sulfur Dioxide
SO_x – Sulfur Oxides
TSCA – Toxic Substances Control Act
VOC – Volatile Organic Compounds
UAC – Utah Administrative Code

Appendix 2 – Web-page Links

Air Monitoring Center: http://www.airmonitoring.utah.gov/

Air Quality Board: http://www.airquality.utah.gov/Air-Quality-Board/Air-Quality-Board-Members.htm

Air Quality Home Page: http://www.airquality.utah.gov/

Air Quality Rules: http://www.airquality.utah.gov/Planning/Rules/index.htm

Cache Valley $PM_{2.5}$: http://www.airquality.utah.gov/Public-Interest/Current-Issues/cache-valley-PM/index.htm

Compliance Section: http://www.airquality.utah.gov/Compliance/index.htm

Mercury: http://www.deq.utah.gov/Issues/Mercury/index.htm

Permitting Section: http://www.airquality.utah.gov/Permits/index.htm

Planning Section: http://www.airquality.utah.gov/Planning/index.htm

Regional Haze: http://www.airquality.utah.gov/Public-Interest/Current-Issues/Regionalhazesip/index.htm

Small Business Assistance: http://www.airquality.utah.gov/Permits/Small_Business_Assistance_Program.htm