State of Utah

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DAQ-097-14

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Bill Reiss, Environmental Engineer

DATE: November 25, 2014

SUBJECT: FINAL ADOPTION: Add new SIP Subsection IX.A.21: Control Measures for Area and Point Sources, Fine Particulate Matter, PM2.5 SIP for the Salt Lake City, UT Nonattainment Area.

On December 14, 2009, EPA made its designations concerning areas that were not attaining the 2006 National Ambient Air Quality Standard (NAAQS) for $PM_{2.5}$. Among those areas designated was the Salt Lake City, UT $PM_{2.5}$ Nonattainment Area.

The Clean Air Act (CAA) required Utah to submit a nonattainment plan for the area. For several years, the Utah Division of Air Quality (UDAQ), in consultation with many stakeholders including EPA Region 8, worked to develop a State Implementation Plan (SIP) for the 2006 24-hour NAAQS for $PM_{2.5}$. On December 4, 2013, the Board adopted that SIP and it was subsequently submitted to EPA.

As the SIP was nearing completion, the D.C. Circuit Court of Appeals found that EPA had incorrectly interpreted the Clean Air Act when determining how to implement the NAAQS for $PM_{2.5}$. The January 4, 2013, court ruling held that EPA should have implemented the $PM_{2.5}$ NAAQS based on *both* CAA Subpart 1 *and* Subpart 4 of Part D, Title I. It also remanded the 2007 $PM_{2.5}$ Implementation Rule back to EPA so that the agency could address implementation of the $PM_{2.5}$ NAAQS under Subpart 4.

Utah was therefore required to supplement its SIP in order to address the additional requirements of Subpart 4. The most fundamental departure of Subpart 4 is that it classifies PM nonattainment areas as either Moderate or Serious and includes somewhat different planning requirements for each.

In the wake of the court ruling, EPA issued a "Deadlines Rule" that: 1) classified the Salt Lake City, UT $PM_{2.5}$ Nonattainment Area as a Moderate Area, 2) established a deadline of December 31, 2014, for Utah to submit the necessary SIP elements, and 3) established the attainment date for the area as December 31, 2015.

To meet this due-date in the Deadlines Rule, a SIP addressing the Subpart 4 planning requirements for Moderate Areas was proposed by the Board on September 3, 2014.

A 30-day public comment period was held, which included a public hearing. A summary of the comments received during the comment period along with the responses from UDAQ is attached.

One central point made throughout the responses to those comments is that there is still no new $PM_{2.5}$ implementation rule to guide states in the development of their SIPs, even as those SIPs are now coming due.

Any recommended revision to SIP Subsection IX.A.21resulting from these comments has been identified in the amended attachment using strikeout and underline.

Staff Recommendation: Staff recommends the Board adopt SIP Subsection IX.A.21: Control Measures for Area and Point Sources, Fine Particulate Matter, $PM_{2.5}$ SIP for the Salt Lake City, UT Nonattainment Area as amended.

UTAH

State Implementation Plan

Control Measures for Area and Point Sources, Fine Particulate Matter,

$PM_{2.5}$ SIP for the Salt Lake City, UT Nonattainment Area

Section IX. Part A.21

Adopted by the Utah Air Quality Board

December 3, 2014

Acronyms

BACT	Best Available Control Technology
CAA	Clean Air Act
CFR	Code of Federal Regulations
CMAQ	Community Multiscale Air Quality
CTG	Control Techniques Guideline Documents
DAQ	Utah Division of Air Quality (also UDAQ)
EPA	Environmental Protection Agency
FRM	Federal Reference Method
MACT	Maximum Available Control Technology
MATS	Model Attainment Test Software
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
NH_3	Ammonia
NO_x	Nitrogen Oxides
NSPS	New Source Performance Standard
NSR	New Source Review
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

1	RACM	Reasonably Available Control Measures
2	RACT	Reasonably Available Control Technology
3	RFP	Reasonable Further Progress
4	SIP	State Implementation Plan
5	SMOKE	Sparse Matrix Operator Kernal Emissions
6	SO_2	Sulfur Dioxide
7	SO_x	Sulfur Oxides
8	TSD	Technical Support Document
9	VOC	Volatile Organic Compounds
10	UAC	Utah Administrative Code
11	WRF	Weather Research and Forecasting

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Chapter 1 – INTRODUCTION AND BACKGROUND

1.1 Fine Particulate Matter

According to EPA's website, particulate matter, or PM, is a complex mixture of extremely small particles and liquid droplets. Particulate matter is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles.

The size of particles is directly linked to their potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Other negative effects are reduced visibility and accelerated deterioration of buildings.

EPA groups particle pollution into two categories:

- "Inhalable coarse particles," such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter. Utah has previously addressed inhalable coarse particles as part of its PM_{10} SIPs for Salt Lake and Utah Counties, but this fraction is not measured as $PM_{2.5}$ and will not be a subject for this nonattainment SIP.

- "Fine particles," such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller and thus denoted as $PM_{2.5}$. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air.

PM concentration is reported in micrograms per cubic meter or $\mu g/m^3$. The particulate is collected on a filter and weighed. This weight is combined with the known amount of air that passed through the filter to determine the concentration in the air.

1.2 Health and Welfare Impacts of $PM_{2.5}$

Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, for example;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;

- nonfatal heart attacks; and
- pre-mature death in people with heart or lung disease.

People with heart or lung diseases, children and older adults are the most likely to be affected by particle pollution exposure. However, even healthy people may experience temporary symptoms from exposure to elevated levels of particle pollution.

1.3 Fine Particulate Matter in Utah

Excluding wind-blown desert dust events, wild land fires, and holiday related fireworks, elevated $PM_{2.5}$ in Utah occurs when stagnant cold pools develop during the winter season.

The synoptic conditions that lead to the formation of cold pools in Utah's nonattainment areas are: synoptic scale ridging, subsidence, light winds, snow cover (often), and cool- to-cold surface temperatures. These conditions occur during winter months, generally mid-November through early March.

During a winter-time cold pool episode, emissions of $PM_{2.5}$ precursors react relatively quickly to elevate overall concentrations, and of course dispersion is very poor due to the very stable air mass. Episodes may last from a few days to tens of days when meteorological conditions change to once again allow for good mixing.

The scenario described above leads to exceedances and violations of the 24-hour health standard for $PM_{2.5}$. In other parts of the year concentrations are generally low, and even with the high peaks incurred during winter, are well within the annual health standard for $PM_{2.5}$.

1.4 2006, NAAQS for $PM_{2.5}$

In September of 2006, EPA revised the (1997) 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 $\mu g/m^3$.

DAQ has monitored $PM_{2.5}$ since 2000, and found that all areas within the state have been in compliance with the 1997 standards. At this new 2006 level, all or parts of five counties have collected monitoring data that is not in compliance with the 24-hr standard.

In 2013, EPA lowered the annual average to 12 $\mu g/m^3$. Monitoring data shows no instances of noncompliance with this revised standard.

1.5 $PM_{2.5}$ Nonattainment Areas in Utah

There are two distinct nonattainment areas for the 2006, $PM_{2.5}$ standards residing entirely within the state of Utah. These are the Salt Lake City, UT, and Provo, UT nonattainment areas, which together encompass what is referred to as the Wasatch Front. A third nonattainment area is more or less geographically defined by the Cache Valley which straddles the border between Utah and Idaho (the Logan, UT – ID nonattainment area.) Figure 1.1 below shows the geographic extent of these areas.

None of these three areas has violated the annual NAAQS for $PM_{2.5}$. Without exception, the exceedances leading to 24-hr NAAQS violations are associated with relatively short-term meteorological occurrences.

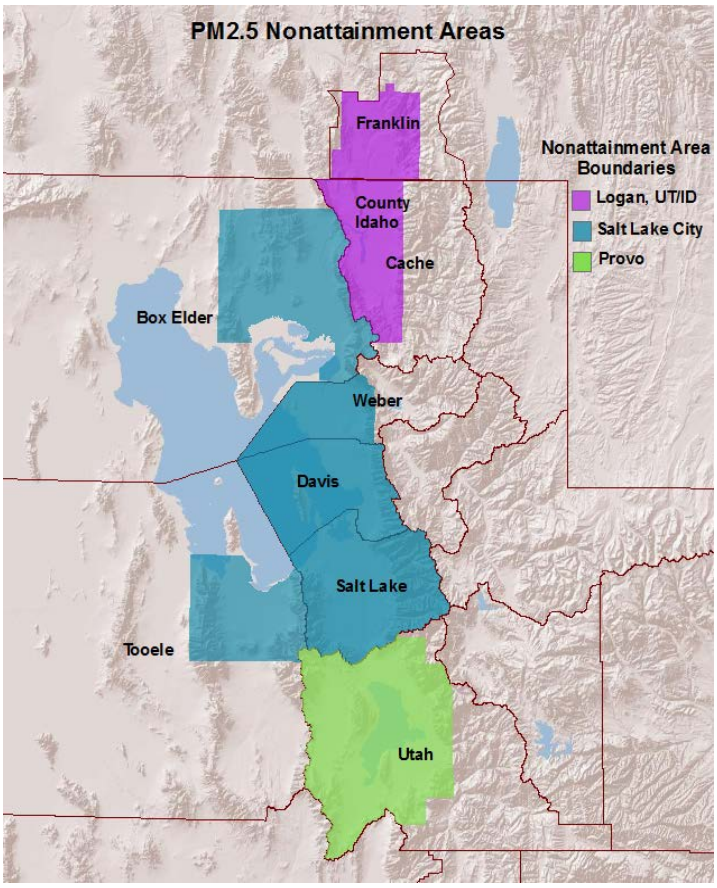


Figure 1.1, Nonattainment Areas for the 2006, $PM_{2.5}$ NAAQS

Each of these three areas was designated, by the EPA, based on the weight of evidence of the following nine factors recommended in its guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

EPA also used analytical tools and data such as pollution roses, fine particulate composition monitoring data, back trajectory analyses, and the contributing emission score (CES) to evaluate these areas.

While the general meteorological characteristics are identical between the Wasatch Front and Cache Valley, there are two important differences related to topography. First, the Cache Valley is a closed basin while the Wasatch Front has many large outlets that connect it to the larger Great Basin. The large outlets along the Wasatch Front provide the potential for greater advection of pollutants and for a potentially weaker cold pool. Second, the Cache Valley is a narrow (<20 km) valley bordered by extremely steep mountains. These topographical differences lead to faster forming, more intense, and more persistent cold pools in Cache Valley relative to the Wasatch Front.

Because of these differences, the two Wasatch Front areas and the Cache Valley are designated as separate nonattainment areas; however, they have all been modeled together within the same modeling domain.

1.6 $PM_{2.5}$ Precursors

The majority of ambient $PM_{2.5}$ collected during a typical cold-pool episode of elevated concentration is secondary particulate matter, born of precursor emissions. The precursor gasses associated with fine particulate matter are SO_2, NOx, volatile organic compounds (VOC), and ammonia (NH_3).

Clean Air Act Section 189(e) requires that the control requirements applicable in plans for major stationary sources of PM_{10} shall also apply to major stationary sources of PM_{10} precursors, except where the Administrator determines that such sources do not contribute significantly to PM_{10} levels which exceed the standard in the area.

As this paragraph now applies also to $PM_{2.5}$ plans the following should be said about the way this plan is structured.

CAA Section 172 does not include any specific applicability thresholds to identify the size of sources that States and EPA must consider in the plan's RACT and RACM analysis. In developing the emissions inventories underlying the SIP, the criteria of 40 CFR 51 for air emissions reporting requirements was used to establish a 100 ton per year threshold for identifying a sub-group of stationary point sources that would be evaluated individually. For the Salt Lake City, UT nonattainment area, there are 28 stationary point sources that met or meet the criteria of 100 tons per year for $PM_{2.5}$ or any $PM_{2.5}$ precursor.

The control evaluations for each of these sources included $PM_{2.5}$ as well as $PM_{2.5}$ precursors. This principle was extended to the non-stationary source categories as well.

When evaluating the cost per ton necessary to reduce emissions, consideration was given to the resulting $PM_{2.5}$ concentrations. Through this process, reasonable controls were identified affecting $PM_{2.5}$, SO_2, NOx and VOC.

No such controls were identified for ammonia. Ammonia occurs in such abundance that $PM_{2.5}$ concentrations are not sensitive to reductions in ammonia unless those reductions are very large. Within the stationary source category, there really were no significant amounts of ammonia to evaluate. The largest contributor to the ammonia inventory was the agricultural sector, and the maximum possible amount of ammonia reduction from that sector would still not be enough to affect a reduction in $PM_{2.5}$.

Additional information regarding control measures may be found in Chapter 6 as well as the Technical Support Document (TSD).

Chapter 2 – REQUIREMENTS FOR 2006, $PM_{2.5}$ PLAN REVISIONS

2.1 Requirements for Nonattainment SIPs

Section 110 of the Clean Air Act lists the requirements for implementation plans. Many of these requirements speak to the administration of an air program in general. Section 172 of the Act contains the plan requirements for nonattainment areas. Some of the more notable requirements identified in these sections of the Act that pertain to this SIP include:

- Implementation of Reasonably Available Control Measures (RACM) as expeditiously as practicable
- Reasonable Further Progress (RFP) toward attainment of the National Ambient Air Quality Standards by the applicable attainment date
- Enforceable emission limits as well as schedules for compliance
- A comprehensive inventory of actual emissions
- Contingency measures to be undertaken if the area fails to make reasonable further progress or attain the NAAQS by the applicable attainment date

On January 4, 2013, D.C. Circuit Court of Appeals found that EPA had incorrectly interpreted the Clean Air Act when determining how to implement the National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$. The January 4, 2013 court ruling held that the EPA should have implemented the $PM_{2.5}$ NAAQS based on *both* Clean Air Act (CAA) Subpart 1 ("Nonattainment Areas in General" of "Part D – Plan Requirements for Nonattainment Areas") *and* Subpart 4 ("Additional Provisions for Particulate Matter Nonattainment Areas") of Part D, title 1. EPA had (incorrectly) required states to develop their SIPs based only on Subpart 1. Therefore, as of January 4, 2013, Subpart 4 also applies.

Under Subpart 4, nonattainment areas for particulate matter may carry the classification of either moderate or serious. Subpart 4 addresses the attainment dates and planning provisions for both moderate and serious PM nonattainment areas.

In the wake of the decision by the D.C. Circuit, EPA has promulgated a "Deadlines Rule" that identifies each of Utah's three $PM_{2.5}$ nonattainment areas as moderate. It specifies December 31, 2014 as the SIP submission deadline for these moderate $PM_{2.5}$ nonattainment areas, and further specifies December 31, 2015 as the attainment date for each area.

More specific requirements for the preparation, adoption, and submittal of implementation plans are specified in 40 CFR Part 51. Subpart Z of Part 51 had contained provisions for Implementation of $PM_{2.5}$ National Ambient Air Quality Standards. However, one consequence of the January 4, 2013 Court ruling was to revoke Subpart Z. This leaves only the more general requirements of Part 51.

2.2 $PM_{2.5}$ SIP Guidance

Beyond what had been codified in Subpart Z of Part 51 concerning the Implementation of the $PM_{2.5}$ NAAQS, EPA had provided additional clarification and guidance in its Clean Air Particulate Implementation Rule for the 1997, $PM_{2.5}$ NAAQS (FR 72, 20586) and its subsequent Implementation Guidance for the 2006, 24-Hour Fine Particle NAAQS (March 2, 2012). This too was revoked by the D.C. Circuit Court's decision. Until such time as a new implementation rule for $PM_{2.5}$ is promulgated, the Deadlines Rule recommends the General Preamble, EPA's longstanding general guidance that interprets the 1990 amendments to the CAA, as the applicable guidance for states to follow while preparing SIPs for $PM_{2.5}$ nonattainment areas.

2.3 Summary of this SIP Proposal

This implementation plan was developed to meet the requirements specified in the law, rule, and appropriate guidance documents identified above. Discussed in the following chapters are: air monitoring, reasonably available control measures, modeled attainment demonstration, emission inventories, reasonable further progress toward attainment, transportation conformity, and contingency measures. Additional information is provided in the technical support document (TSD).

Chapter 3 – Ambient Air Quality Data

3.1 Measuring Fine Particle Pollution in the Atmosphere

Utah has monitored $PM_{2.5}$ in its airsheds since 2000 following the promulgation of the 1997, $PM_{2.5}$ NAAQS which was set at 65 $\mu g/m^3$ for a 24-hour averaging period. $PM_{2.5}$ monitoring sites were initially located based on concentrations of PM_{10}, which historically were measured at sites located based on emissions of primary particles. $PM_{2.5}$ concentrations, especially during Utah's wintertime valley temperature inversions, tend to be distributed more homogenously within a specific airshed. Homogeneity of $PM_{2.5}$ concentrations means that one or two monitors are adequate to determine compliance with the NAAQS in specific airsheds. DAQ's monitors are appropriately located to assess concentration, trends, and changes in $PM_{2.5}$ concentrations. During Utah's wintertime cold-pool episodes, every day sampling and real time monitoring are needed for modeling and public notification.

3.2 Utah's Air Monitoring Network

The Air Monitoring Center (AMC) maintains an ambient air monitoring network in Utah that collects both air quality and meteorological data. Figure 3.1 shows the location of sites along the Wasatch Front that collect $PM_{2.5}$ data. Twelve sites collect $PM_{2.5}$ data using the Federal Reference Method (FRM); $PM_{2.5}$ is collected on filters over a 24 hour period and its mass is measured gravimetrically. Seven of those sites also measure $PM_{2.5}$ concentrations continuously in real-time. Real-time $PM_{2.5}$ data is useful both for pollution forecasting and to compare with 24-hour concentrations of $PM_{2.5}$ collected on filters. Of the twelve sites that use the FRM to measure $PM_{2.5}$, six sites collect $PM_{2.5}$ data daily and six sites collect $PM_{2.5}$ data on every third day. Three sites along the Wasatch Front collect speciated $PM_{2.5}$. Particulate matter on the speciated $PM_{2.5}$ filters is analyzed for organic and inorganic carbon and a list of 48 elements. $PM_{2.5}$ speciation data is particularly useful in helping to identify sources of particulate matter. The ambient air quality monitoring network along Utah's Wasatch Front and in the Cache Valley meets EPA requirements for monitoring networks.

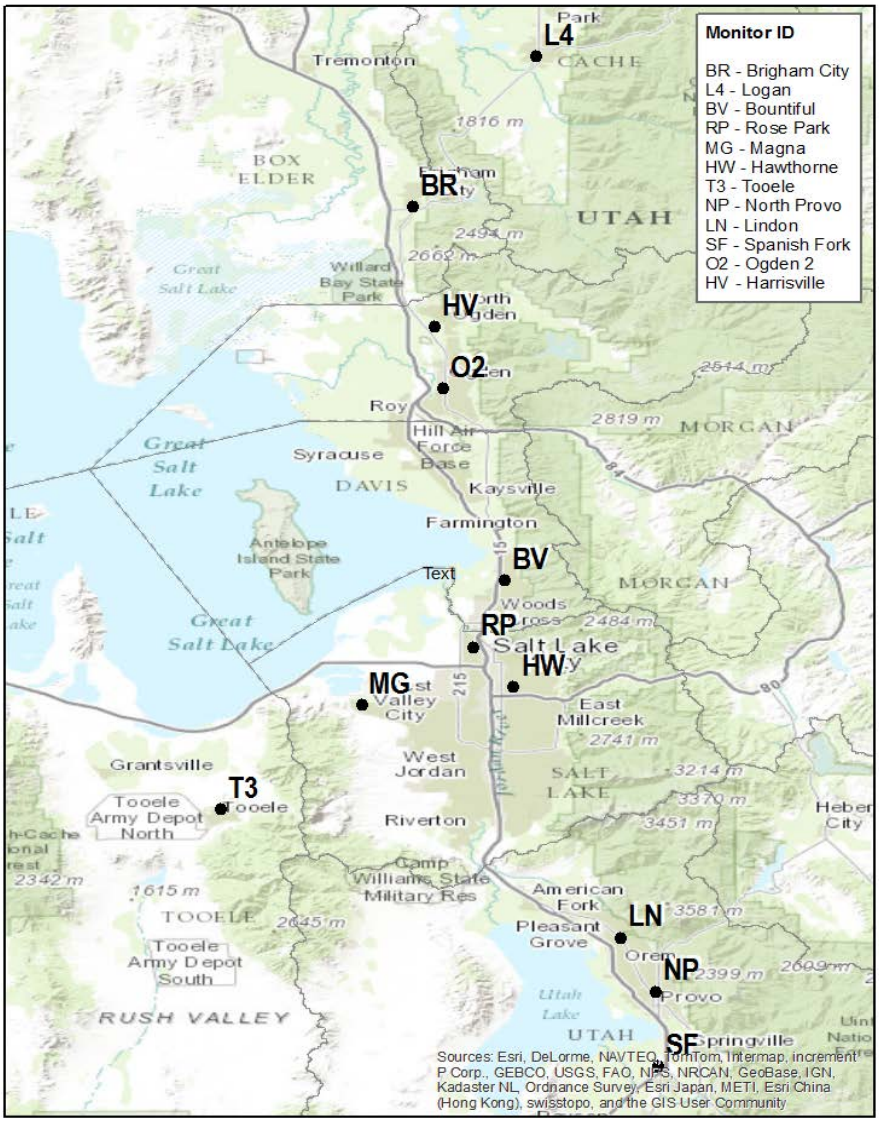


Figure 3.1, Utah's $PM_{2.5}$ Air Monitoring Network

3.3 Annual $PM_{2.5}$ – Mean Concentrations

The procedure for evaluating $PM_{2.5}$ data with respect to the NAAQS is specified in Appendix N to 40 CFR Part 50. Generally speaking, the annual $PM_{2.5}$ standard is met when a three-year average of annual

mean values is less than or equal to 12.0 µg/m^3. Each annual mean is itself an average of four quarterly averages.

Table 3.1, below shows the running 3-year averages of annual mean values for each of Utah's monitoring locations. The data in the table spans the years 2008 through 2012. These are the years surrounding 2010, the year for which the baseline modeling inventory was prepared. It can be seen from the data that there are no locations at which the annual NAAQS was violated. It should be noted that the conclusion would be no different if the most recent data from 2013 were considered.

		3-Year Average of Annual Mean Concentrations		
Location	**County**	**08 - 10**	**09 - 11**	**10 - 12**
Logan (Combined POC 1 & 2)	Cache	10.0	9.7	8.7
Brigham City	Box Elder	8.3	8.2	7.7
Ogden 2 (POC 1)	Weber	9.7	9.5	9.1
Harrisville	Weber	8.6	8.3	7.6
Bountiful	Davis	9.8	9.2	8.3
Rose Park (POC 1)	Salt Lake	10.4	9.7	9.2
Magna	Salt Lake	8.5	8.4	7.7
Hawthorn (POC 1)	Salt Lake	10.4	9.7	8.8
Tooele	Tooele	6.8	6.8	6.3
Lindon (POC 1)	Utah	9.8	9.1	8.3
North Provo	Utah	9.4	8.7	8.1
Spanish Fork	Utah	8.8	8.5	7.7

Table 3.1, $PM_{2.5}$ Annual Mean Concentrations

3.4 Daily $PM_{2.5}$ – Averages of 98th Percentiles and Design Values

The procedure for evaluating $PM_{2.5}$ data with respect to the NAAQS is specified in Appendix N to 40 CFR Part 50. Generally speaking, the 24-hr. $PM_{2.5}$ standard is met when a three-year average of 98th percentile values is less than or equal to 35 µg/m^3. Each year's 98th percentile is the daily value below which 98% of all daily values fall.

Table 3.2, below shows the running 3-year averages of 98th percentile values for each of Utah's monitoring locations. Again, the data in the table spans the years 2008 through 2012 which are the years surrounding 2010, the baseline modeling inventory. It can be seen from the data that there are many locations at which the 24-hr. NAAQS has been violated, and this SIP has been structured to specifically address the 24-hr. standard.

Site-Specific Baseline Design Values:		3-Year Average of 98th Percentiles			Baseline Design Value
Location	County	08 - 10	09 - 11	10 - 12	
Logan (Combined POC 1 & 2)	Cache	42.6	42.4	37.2	**40.7**
Brigham City	Box Elder	42.5	40.1	37.2	**39.9**
Ogden 2 (POC 1)	Weber	37.0	41.1	37.4	**38.5**
Harrisville	Weber	35.6	36.6	33.2	**35.1**
Bountiful	Davis	37.7	40.3	34.4	**37.5**
Rose Park (POC 1)	Salt Lake	40.9	40.7	35.4	**39.0**
Magna	Salt Lake	32.8	34.5	30.3	**32.5**
Hawthorn (POC 1)	Salt Lake	43.6	44.5	38.1	**42.1**
Tooele	Tooele	25.9	27.1	24.4	**25.8**
Lindon (POC 1)	Utah	40.5	40.9	32.4	**37.9**
North Provo	Utah	36.4	35.1	28.6	**33.4**
Spanish Fork	Utah	39.3	41.7	34.6	**38.5**

Table 3.2, 24-hour $PM_{2.5}$ Monitored Design Values

As mentioned in the foregoing paragraph, this SIP is structured to address the 24-hr. $PM_{2.5}$ NAAQS. As such the modeled attainment test must consider monitored baseline design values from each of these locations. EPA's modeling guidance[1] recommends this be calculated using three-year averages of the 98th percentile values. To calculate the monitored baseline design value, EPA recommends an average of three such three-year averages that straddle the baseline inventory. 2010 is the year represented by the baseline inventory. Therefore, the three-year average of 98th percentile values collected from 2008-2010 would be averaged together with the three-year averages for 2009-2011 and 2010-2012 to arrive at the site-specific monitored baseline design values. These values are also shown in Table 3.2[2].

3.5 Composition of Fine Particle Pollution – Speciated Monitoring Data

DAQ operates three $PM_{2.5}$ speciation sites. The Hawthorne site in Salt Lake County is one of 54 Speciation Trends Network (STN) sites operated nationwide on an every-third-day sampling schedule. Sites at Bountiful/Viewmont in Davis County and Lindon in Utah County are State and Local Air

[1] Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze (EPA -454B-07-002, April 2007)

[2] Recalculating the design values by replacing the 98th percentiles from 2008 with the most recent 98th percentiles from 2013 has a mixed effect throughout the monitoring network, with some sites increasing and others decreasing. The design value for Hawthorne, the controlling monitor, would decrease by 0.8 µg/m3. This decrease is not significant enough to change the conclusion drawn in Section 5.9.

Monitoring Stations (SLAMS) $PM_{2.5}$ speciation sites that operate on an every-sixth-day sampling schedule.

Filters are prepared by the EPA contract laboratory and shipped to Utah for sampling. Samples are collected for particulate mass, elemental analysis, identification of major cations and anions, and concentrations of elemental and organic carbon as well as crustal material present in $PM_{2.5}$. Carbon sampling and analysis changed in 2007 to match the Interagency Monitoring of Protected Visual Environments (IMPROVE) method using a modified IMPROVE sampler at all sites.

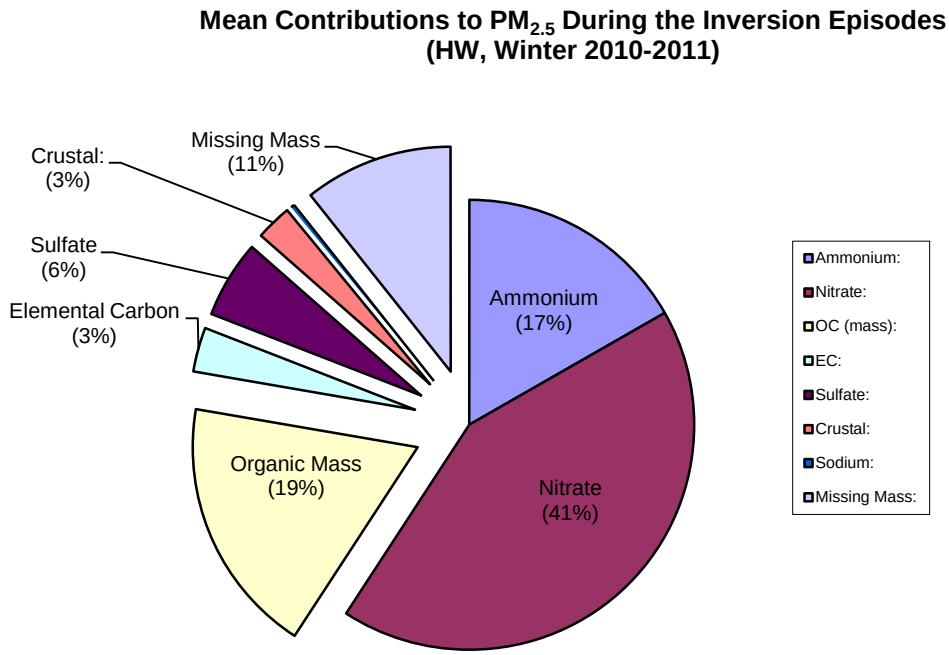
The $PM_{2.5}$ is collected on three types of filters: Teflon, nylon, and quartz. Teflon filters are used to characterize the inorganic contents of $PM_{2.5}$. Nylon filters are used to quantify the amount of ammonium nitrate, and quartz filters are used to quantify the organic and inorganic carbon content in the ambient $PM_{2.5}$.

Data from the speciation network show the importance of volatile secondary particulates during the colder months. These particles are significantly lost in FRM $PM_{2.5}$ sampling.

During the winter periods between 2009 and 2011, DAQ conducted special winter speciation studies aimed at better characterization of $PM_{2.5}$ during the high pollution episodes. These studies were accomplished by shifting the sampling of the Chemical Speciation Network monitors to 1-in-2-day schedule during the months of January and February. Speciation monitoring during the winter high-pollution episodes produced similar results in $PM_{2.5}$ composition each year.

The results of the speciation studies lead to the conclusion that the exceedances of the $PM_{2.5}$ NAAQS are a result of the increased portion of the secondary $PM_{2.5}$ that was chemically formed in the air and not primary $PM_{2.5}$ emitted directly into the troposphere.

Figure 3.2 below shows the contribution of the identified compounds from the speciation sampler both during a winter temperature inversion period and during a well-mixed winter period.



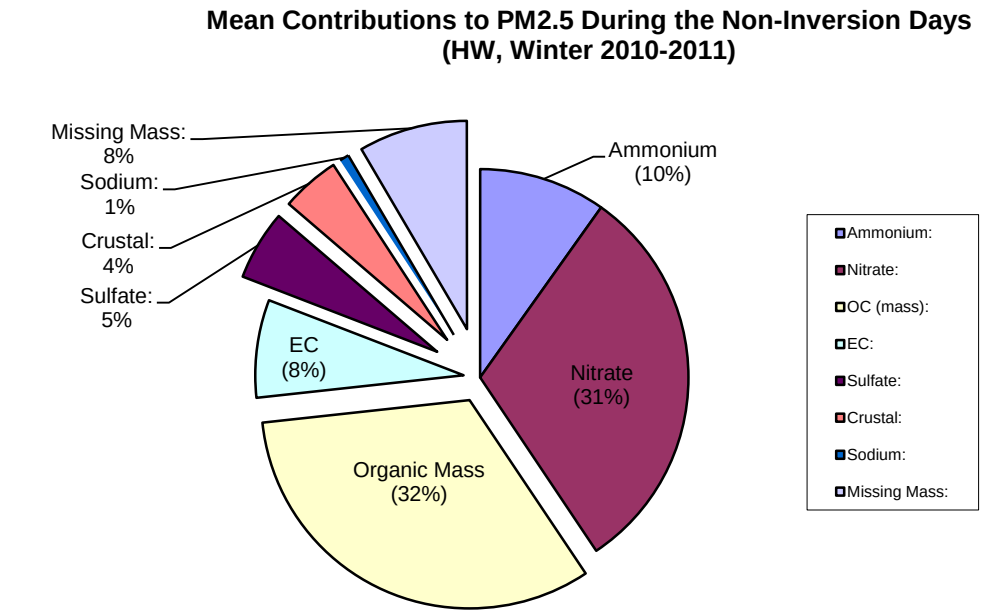


Figure 3.2, Composite Wintertime PM2.5 Speciation Profiles

3.6 PCAP Study

The Persistent Cold Air Pooling Study (PCAPS) is National Science Foundation-funded project conducted by the University of Utah to investigate the processes leading to the formation, maintenance and destruction of persistent temperature inversions in Salt Lake Valley. The study ended in March of 2014. Field work for the project was conducted in the winter of 2010-2011 and focused on the meteorological dynamics of temperature inversions in the Salt Lake Valley and in the Bingham Canyon pit mine in the southwest corner of Salt Lake Valley. In addition to identifying key meteorological processes involved in the dynamics of temperature inversions in Salt Lake Valley, the other primary objectives of PCAPS is to determine how persistent temperature inversions affect air pollution transport and diffusion in urban basins and to develop more accurate meteorological models describing the formation, persistence and dispersion of temperature inversions in Salt Lake Valley.

Analyses of most data sets collected during the PCAPS are still underway. However, one study examining $PM_{2.5}$ concentrations along an elevation gradient north of Salt Lake City (1300-1750 meters) showed that $PM_{2.5}$ concentrations generally decreased with altitude and increased with time during a single temperature inversion event.[1] Final results from PCAPS will help DAQ understand both how persistent temperature inversions affect $PM_{2.5}$ concentrations along the Wasatch Front and will enhance DAQ's ability to accurately forecast the formation and breakup of temperature inversion that lead to poor wintertime air quality.

3.7 Ammonia (NH_3) Studies

The Division of Air Quality deployed an ammonia monitor as a part of the special winter study for 2009. A URG 9000 instrument was used to record hourly values of ambient ammonia between the months of December and February.

The resulting measurements showed that the ambient concentration of ammonia tended to be generally an order of magnitude higher than those of nitric acid: 12-17 ppbv and 1-2 ppbv, respectively.

Unfortunately, the use of the instrument proved to be excessively labor intensive due to the high frequency of calibrations and corrections for drift. The data obtained during the winter of 2009, albeit valuable for rough estimation of the ambient ammonia concentrations, contained an abnormal amount of error for accurate mechanistic analysis.

[1] Silcox, G.D., K.E. Kelly, E.T. Crosman, C.D. Whiteman, and B.L. Allen, 2012: Wintertime $PM_{2.5}$ concentrations in Utah's Salt Lake Valley during persistent multi-day cold air pools. Atmospheric Environment, 46, 17-24.

Chapter 4 – EMISSION INVENTORY DATA

4.1 Introduction

The emissions inventory is one means used by the state to assess the level of pollutants and precursors released into the air from various sources. The methods by which emissions inventories are collected and calculated are constantly improving in response to better analysis and more comprehensive rules. The inventories underlying this SIP were compiled using the best information available.

The sources of emissions that were inventoried may be discussed as belonging to four general categories: industrial point sources; on-road mobile sources; off-road mobile sources; and area sources which represent a collection of smaller, more numerous point sources, residential activities such a home heating, and in some cases biogenic emissions.

This SIP is concerned with $PM_{2.5}$, both primary in its origin and secondary, referring to its formation removed in time and space from the point of origin for certain precursor gasses. Hence, the pollutants of concern, at least for inventory development purposes, included $PM_{2.5}$, SO_2, NO_x, VOC, and NH_3.

On-road mobile sources are inventoried using EPA's MOVES2010 model, in conjunction with information generated by travel demand models such as vehicle speeds and miles traveled. The inventory information is calculated in units of tons per day, adjusted for winter conditions. Emissions from the other three categories are calculated in terms of tons per year.

Prior to use in the air quality model, the emissions are pre-processed to account for the seasonality of Utah's difficulty with secondary $PM_{2.5}$ formation during winter months. These temporal adjustments also account for daily and weekly activity patterns that affect the generation of these emissions.

To acknowledge the episodic and seasonal nature of Utah's elevated $PM_{2.5}$ concentrations, inventory information presented herein is, unless otherwise noted, a reflection of the temporal adjustments made prior to air quality modeling. This makes more appropriate the use of these inventories for such purposes as correlation with measured $PM_{2.5}$ concentrations, control strategy evaluation, establishing budgets for transportation conformity, and tracking rates of progress.

There are various time horizons that are significant to the development of this SIP. It is first necessary to look at past episodes of elevated $PM_{2.5}$ concentrations in order to develop the air quality model. The episodes studied as part of the SIP occurred in 2007, 2008, 2009, and 2010. It is then necessary to look several years into the future when developing emission control strategies. The significant time horizon for this plan relates to the statutory attainment date, December 31, 2015. A projected inventory for 2015 is prepared and compared with a baseline inventory that is contemporaneous with the monitored design values discussed in Section 3.4. This baseline is represented by the year 2010. Inventories must be prepared to evaluate all of these time horizons.

4.2 The 2008 Emissions Inventory

The forgoing paragraph identified numerous points in time for which an understanding of emissions to the air is important to plan development. The basis for each of these assessments was the 2008 tri-annual inventory. This inventory represented, at the time it was selected for use, the most recent comprehensive inventory compiled by UDAQ. In addition to the large major point sources that are required to report emissions every year, the tri-annual inventories consider emissions from many more, smaller point sources. These inventories are collected in accordance with state and federal rules that ensure proper methods and comprehensive quality assurance.

Thus, to develop other inventories for each of the years discussed above, the 2008 inventory was either back-cast and adjusted for certain episodic conditions, or forecast to represent more typical conditions.

4.3 Characterization of Utah's Airsheds

As said at the outset, an emissions inventory provides a means to assess the level of pollutants and precursors released into the air from various sources. This in turn allows for an overall assessment of a particular airshed or even a comparison of one airshed to another.

The modeling analysis used to support this SIP considers a regional domain that encompasses three distinct airsheds belonging to three distinct $PM_{2.5}$ nonattainment areas; The Cache Valley (the Logan UT/ID nonattainment area), the central Wasatch Front (Salt Lake City, UT nonattainment area), and the southern Wasatch Front (Provo, UT nonattainment area).

The inventories developed for each of these three areas illustrate many similarities but also a few notable differences. All three areas are more or less dominated by a combination of on-road mobile and area sources. However, emissions from large point sources are non-existent in the Cache Valley. These emissions are mostly situated along the Wasatch Front, and primarily exhibited in the Salt Lake City nonattainment area. Conversely, most of the agricultural emissions are located in the Cache Valley.

The tables presented below provide a broad overview of the emissions in the respective areas. They are organized to show the relative contributions of emissions by source category (e.g. point / area / mobile).

Table 4.1 shows the 2010 Baseline emissions in each area of the modeling domain.

	NA-Area	Source Category	PM2.5	NOX	VOC	NH3	SO2
2010 Sum of Emissions (tpd)	Logan, UT-ID						
		Area Sources	0.54	1.63	4.16	4.31	0.26
		Mobile Sources	~~0.37~~	~~6.48~~	~~4.99~~	~~0.12~~	~~0.04~~
		NonRoad	0.13	1.15	2.28	0.00	0.02
		Point Sources	0.00	0.02	0.63	0.00	0.00
		Total	~~1.05~~	~~9.28~~	~~12.06~~	~~4.43~~	~~0.32~~
2010 Sum of Emissions (tpd)	Provo, UT						
		Area Sources	1.86	5.56	12.77	6.53	0.28
		Mobile Sources	~~1.38~~	~~25.39~~	~~15.62~~	~~0.44~~	~~0.16~~
		NonRoad	0.31	4.40	1.71	0.00	0.09
		Point Sources	0.26	0.93	0.67	0.29	0.03
		Total	~~3.81~~	~~36.28~~	~~30.78~~	~~7.26~~	~~0.56~~
2010 Sum of Emissions (tpd)	Salt Lake City, UT						
		Area Sources	5.87	17.71	51.53	17.96	0.88
		Mobile Sources	~~5.49~~	~~99.60~~	~~62.49~~	~~1.86~~	~~0.62~~
		NonRoad	1.27	23.04	9.50	0.01	0.66
		Point Sources	3.89	20.14	6.48	0.64	10.64
		Total	~~16.52~~	~~160.48~~	~~130.01~~	~~20.47~~	~~12.81~~
2010 Sum of Emissions (tpd)	Surrounding Areas						
		Area Sources	1.78	3.08	13.95	34.29	1.13
		Mobile Sources	~~1.34~~	~~28.88~~	~~11.03~~	~~0.33~~	~~0.15~~
		NonRoad	0.57	7.73	10.66	0.00	0.14
		Point Sources	3.39	129.34	2.92	0.75	43.43
		Total	~~7.07~~	~~169.03~~	~~38.56~~	~~35.38~~	~~44.85~~
2010 Total							

	NA-Area	Source Category	PM2.5	NOX	VOC	NH3	SO2
2010	Logan, UT-ID						
Sum of Emissions (tpd)		Area Sources	0.54	1.63	4.16	4.31	0.26
		Mobile Sources	0.67	6.48	4.99	0.12	0.04
		NonRoad	0.13	1.15	2.28	0.00	0.02
		Point Sources	0.00	0.02	0.63	0.00	0.00
		Total	1.35	9.28	12.06	4.43	0.32
2010	Provo, UT						
Sum of Emissions (tpd)		Area Sources	1.86	5.56	12.77	6.53	0.28
		Mobile Sources	2.20	25.39	15.63	0.44	0.16
		NonRoad	0.31	4.40	1.71	0.00	0.09
		Point Sources	0.26	0.93	0.67	0.29	0.03
		Total	4.63	36.29	30.78	7.26	0.56
2010	Salt Lake City, UT						
Sum of Emissions (tpd)		Area Sources	5.87	17.71	51.53	17.96	0.88
		Mobile Sources	8.59	99.63	62.51	1.86	0.63
		NonRoad	1.27	23.04	9.50	0.01	0.66
		Point Sources	3.89	20.14	6.48	0.64	10.64
		Total	19.62	160.51	130.02	20.47	12.81
2010	Surrounding Areas						
Sum of Emissions (tpd)		Area Sources	1.78	3.08	13.95	34.29	1.13
		Mobile Sources	2.31	28.89	11.03	0.33	0.15
		NonRoad	0.57	7.73	10.66	0.00	0.14
		Point Sources	3.39	129.34	2.92	0.75	43.43
		Total	8.04	169.03	38.57	35.38	44.85
2010 Total							

Table 4.1, Emissions Summary for 2010 (SMOKE). Emissions are presented in tons per average winter day. Mobile source emissions summaries are from the AP-42 (road dust) and MOVES model output. $PM_{2.5}$ for mobile sources includes tire and brake wear, sulfate, elemental and organic carbon, and road dust. VOC for mobile sources includes refueling spillage and displacement vapor loss emissions.

Table 4.2 is specific to the Salt Lake, UT nonattainment area, and shows emissions for both the baseline year and the attainment year. These totals include projections concerning growth in population, vehicle miles traveled, and the economy. They also include the effects of emissions control strategies that are either already promulgated or were required as part of the SIP.

	NA-Area	Source Category	PM2.5	NOX	VOC	NH3	SO2
2010	Salt Lake City, UT						
Sum of Emissions (tpd)		Area Sources	5.87	17.71	51.53	17.96	0.88
		Mobile Sources	~~5.49~~	~~99.60~~	~~62.49~~	~~1.86~~	~~0.62~~
		NonRoad	1.27	23.04	9.50	0.01	0.66
		Point Sources	3.89	20.14	6.48	0.64	10.64
		Total	~~16.52~~	~~160.48~~	~~130.01~~	~~20.47~~	~~12.81~~
2015	Salt Lake City, UT						
Sum of Emissions (tpd)		Area Sources	5.22	16.18	39.04	17.66	0.90
		Mobile Sources	~~4.59~~	~~77.57~~	~~47.31~~	~~1.59~~	~~0.72~~
		NonRoad	1.00	18.56	7.50	0.01	0.57
		Point Sources	4.26	22.81	8.59	1.29	7.87
		Total	~~15.07~~	~~135.12~~	~~102.44~~	~~20.55~~	~~10.06~~

	NA-Area	Source Category	PM2.5	NOX	VOC	NH3	SO2
2010	Salt Lake City, UT						
Sum of Emissions (tpd)		Area Sources	5.87	17.71	51.53	17.96	0.88
		Mobile Sources	8.59	99.63	62.51	1.86	0.63
		NonRoad	1.27	23.04	9.50	0.01	0.66
		Point Sources	3.89	20.14	6.48	0.64	10.64
		Total	19.62	160.51	130.02	20.47	12.81
2015	Salt Lake City, UT						
Sum of Emissions (tpd)		Area Sources	5.22	16.18	39.04	17.66	0.90
		Mobile Sources	8.20	77.59	47.33	1.59	0.72
		NonRoad	1.00	18.56	7.50	0.01	0.57
		Point Sources	4.26	22.81	8.59	1.29	7.87
		Total	18.68	135.14	102.45	20.55	10.06

Table 4.2, Emissions Summaries for the Salt Lake City, UT Nonattainment Area; Baseline, RFP and Attainment Years (SMOKE). Emissions are presented in tons per average winter day. Mobile source emissions summaries are from the AP-42 (road dust) and MOVES model output. $PM_{2.5}$ for mobile sources includes tire and brake wear, sulfate, elemental and organic carbon, and road dust. VOC for mobile sources includes refueling spillage and displacement vapor loss emissions.

The 2010 Baseline and 2015 projected emissions estimates are calculated from the Sparse Matrix Operator Kernel Model (SMOKE). More detailed inventory information may be found in the Technical Support Document (TSD).

Chapter 5 – ATTAINMENT DEMONSTRATION

5.1 Introduction

UDAQ conducted a technical analysis to support the development of Utah's 24-hr $PM_{2.5}$ State Implementation Plan (SIP). The analyses include preparation of emissions inventories and meteorological data, and the evaluation and application of regional photochemical model. An analysis using observational datasets will be shown to detail the chemical regimes of Utah's Nonattainment areas.

5.2 Photochemical Modeling

Photochemical models are relied upon by federal and state regulatory agencies to support their planning efforts. Used properly, models can assist policy makers in deciding which control programs are most effective in improving air quality, and meeting specific goals and objectives.

The air quality analyses were conducted with the Community Multiscale Air Quality (CMAQ) Model version 4.7.1, with emissions and meteorology inputs generated using SMOKE and WRF, respectively. CMAQ was selected because it is the open source atmospheric chemistry model co-sponsored by EPA and the National Oceanic Atmospheric Administration (NOAA), thus approved by EPA for this plan.

5.3 Domain/Grid Resolution

UDAQ selected a high resolution 4-km modeling domain to cover all of northern Utah including the portion of southern Idaho extending north of Franklin County and west to the Nevada border (Figure 5.1). This 97 x 79 horizontal grid cell domain was selected to ensure that all of the major emissions sources that have the potential to impact the nonattainment areas were included. The vertical resolution in the air quality model consists of 17 layers extending up to 15 km, with higher resolution in the boundary layer.

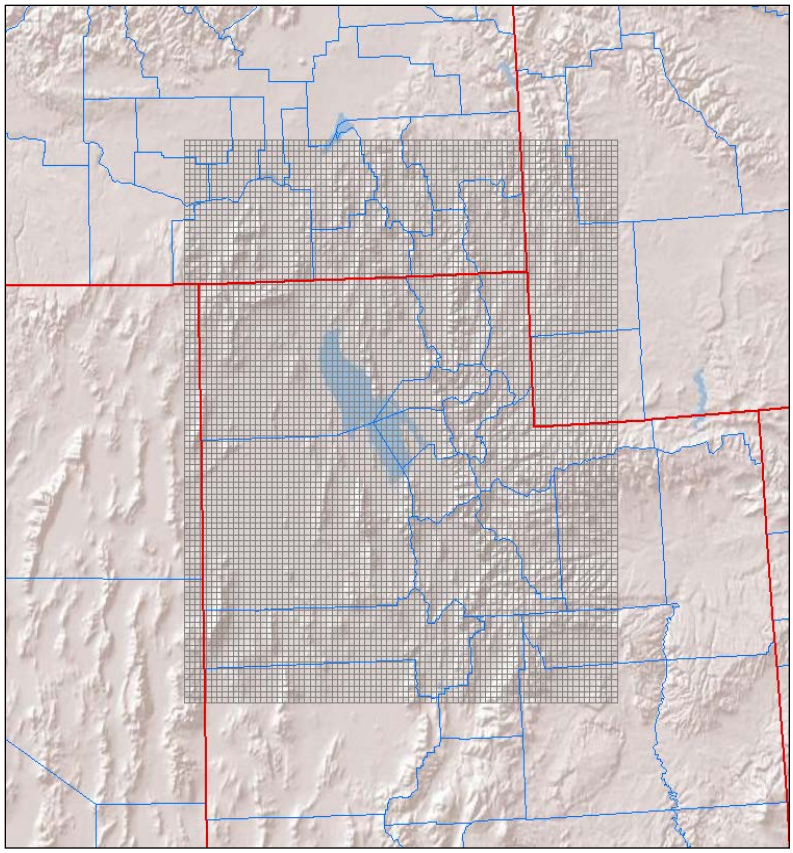


Figure 5.1: Northern Utah photochemical modeling domain.

5.4 Episode Selection

According to EPA's April 2007 "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze" the selection of SIP episodes for modeling should consider the following 4 criteria:

1. Select episodes that represent a variety of meteorological conditions that lead to elevated $PM_{2.5}$.
2. Select episodes during which observed concentrations are close to the baseline design value.
3. Select episodes that have extensive air quality data bases.
4. Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

In general, UDAQ wanted to select episodes with hourly $PM_{2.5}$ concentrations that are reflective of conditions that lead to 24-hour NAAQS exceedances. From a synoptic meteorology point of view, each selected episode features a similar pattern. The typical pattern includes a deep trough over the eastern United States with a building and eastward moving ridge over the western United States. The episodes typically begin as the ridge begins to build eastward, near surface winds weaken, and rapid stabilization due to warm advection and subsidence dominate. As the ridge centers over Utah and subsidence peaks, the atmosphere becomes extremely stable and a subsidence inversion descends towards the surface. During this time, weak insolation, light winds, and cold temperatures promote the development of a persistent cold air pool. Not until the ridge moves eastward or breaks down from north to south is there enough mixing in the atmosphere to completely erode the persistent cold air pool.

From the most recent 5-year period of 2007-2011, UDAQ developed a long list of candidate $PM_{2.5}$ wintertime episodes. Three episodes were selected. An episode was selected from January 2007, an episode from February 2008, and an episode during the winter of 2009-2010 that features multi-event episodes of $PM_{2.5}$ buildup and washout. Further detail of the episodes is below:

- **Episode 1: January 11-20, 2007**

A cold front passed through Utah during the early portion of the episode and brought very cold temperatures and several inches of fresh snow to the Wasatch Front. The trough was quickly followed by a ridge that built north into British Columbia and began expanding east into Utah. This ridge did not fully center itself over Utah, but the associated light winds, cold temperatures, fresh snow, and subsidence inversion produced very stagnant conditions along the Wasatch Front. High temperatures in Salt Lake City throughout the episode were in the high teens to mid-20's Fahrenheit.

Figure 5.2 shows hourly $PM_{2.5}$ concentrations from Utah's 4 $PM_{2.5}$ monitors for January 11-20, 2007. The first 6 to 8 days of this episode are suited for modeling. The episode becomes less suited after January 18 because of the complexities in the meteorological conditions leading to temporary $PM_{2.5}$ reductions.

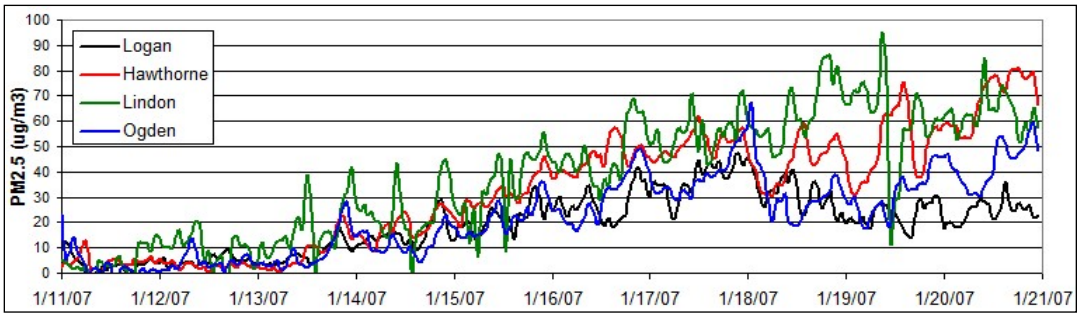


Figure 5.2: Hourly $PM_{2.5}$ concentrations for January 11-20, 2007

- **Episode 2: February 14-18, 2008**

The February 2008 episode features a cold front passage at the start of the episode that brought significant new snow to the Wasatch Front. A ridge began building eastward from the Pacific Coast and centered itself over Utah on Feb 20th. During this time a subsidence inversion lowered significantly from February 16 to February 19. Temperatures during this episode were mild with high temperatures at SLC in the upper 30's and lower 40's Fahrenheit.

The 24-hour average $PM_{2.5}$ exceedances observed during the proposed modeling period of February 14-19, 2008 were not exceptionally high. What makes this episode a good candidate for modeling are the high hourly values and smooth concentration build-up. The first 24-hour exceedances occurred on February 16 and were followed by a rapid increase in $PM_{2.5}$ through the first half of February 17 (Figure 5.3). During the second half of February 17, a subtle meteorological feature produced a mid-morning partial mix-out of particulate matter and forced 24-hour averages to fall. After February 18, the atmosphere began to stabilize again and resulted in even higher $PM_{2.5}$ concentrations during February 20, 21, and 22. Modeling the 14th through the 19th of this episode should successfully capture these dynamics. The smooth gradual build-up of hourly $PM_{2.5}$ is ideal for modeling.

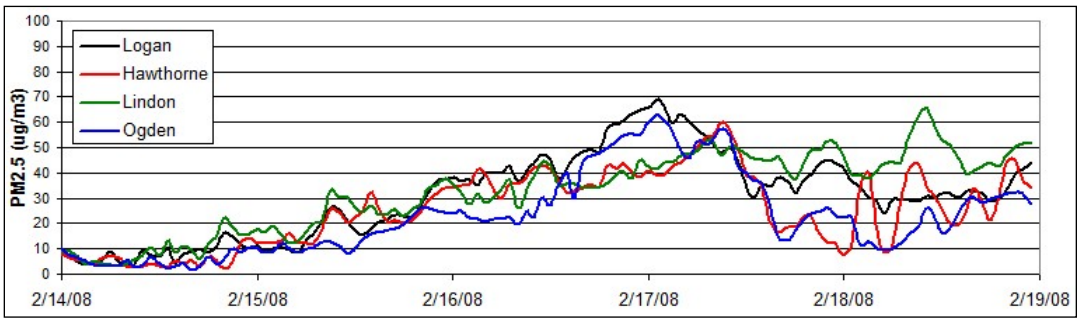


Figure 5.3: Hourly $PM_{2.5}$ concentrations for February 14-19, 2008

- **Episode 3: December 13, 2009 – January 18, 2010**

The third episode that was selected is more similar to a "season" than a single $PM_{2.5}$ episode (Figure 5.4). During the winter of 2009 and 2010, Utah was dominated by a semi-permanent ridge of high pressure that prevented strong storms from crossing Utah. This 35 day period was characterized by 4 to 5 individual $PM_{2.5}$ episodes each followed by a partial $PM_{2.5}$ mix out when a weak weather system passed through the ridge. The long length of the episode and repetitive $PM_{2.5}$ build-up and mix-out cycles makes it ideal for evaluating model strengths and weaknesses and $PM_{2.5}$ control strategies.

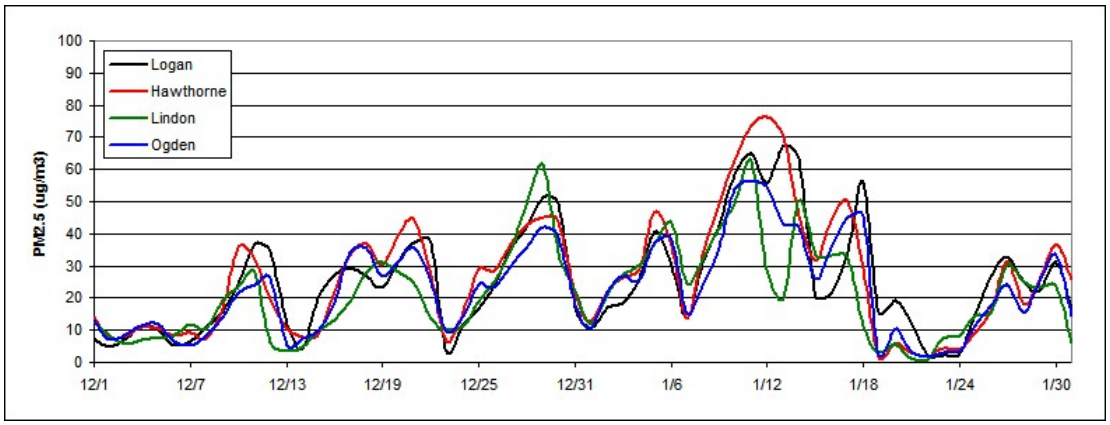


Figure 5.4: 24-hour average $PM_{2.5}$ concentrations for December-January, 2009-10.

5.5 Meteorological Data

Meteorological inputs were derived using the Weather Research and Forecasting (WRF), Advanced Research WRF (WRF-ARW) model version 3.2. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

Model performance of WRF was assessed against observations at sites maintained by the Utah Air Monitoring Center. A summary of the performance evaluation results for WRF are presented below:

- The biggest issue with meteorological performance is the existence of a warm bias in surface temperatures during high $PM_{2.5}$ episodes. This warm bias is a common trait of WRF modeling during Utah wintertime inversions.
- WRF does a good job of replicating the light wind speeds (< 5 mph) that occur during high $PM_{2.5}$ episodes.
- WRF is able to simulate the diurnal wind flows common during high $PM_{2.5}$ episodes. WRF captures the overnight downslope and daytime upslope wind flow that occurs in Utah valley basins.
- WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8 degree temperature increase over 100 vertical meters).

5.6 Photochemical Model Performance Evaluation

The model performance evaluation focused on the magnitude, spatial pattern, and temporal variation of modeled and measured concentrations. This exercise was intended to assess whether, and to what degree, confidence in the model is warranted (and to assess whether model improvements are necessary).

CMAQ model performance was assessed with observed air quality datasets at UDAQ-maintained air monitoring sites (Figure 5.5). Measurements of observed $PM_{2.5}$ concentrations along with gaseous precursors of secondary particulate (e.g., NO_x, ozone) and carbon monoxide are made throughout winter at most of the locations in Figure 5.5. $PM_{2.5}$ speciation performance was assessed using the three Speciation Monitoring Network Sites (STN) located at the Hawthorne site in Salt Lake City, the Bountiful site in Davis County, and the Lindon site in Utah County.

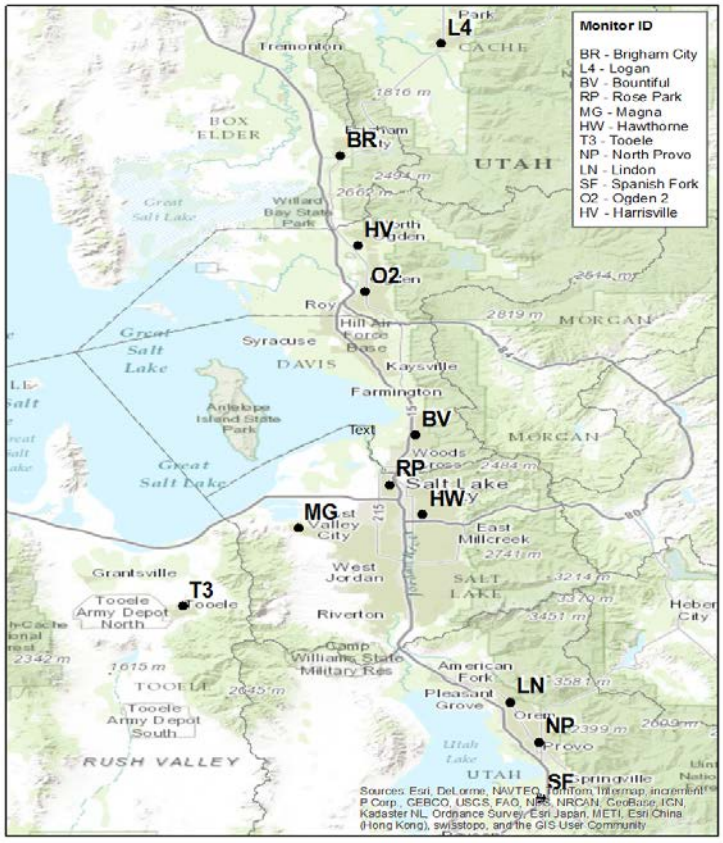


Figure 5.5: UDAQ monitoring network.

A spatial plot is provided for modeled 24-hr $PM_{2.5}$ for 2010 January 03 in Figure 5.6. The spatial plot shows the model does a reasonable job reproducing the high $PM_{2.5}$ values, and keeping those high values confined in the valley locations where emissions occur.

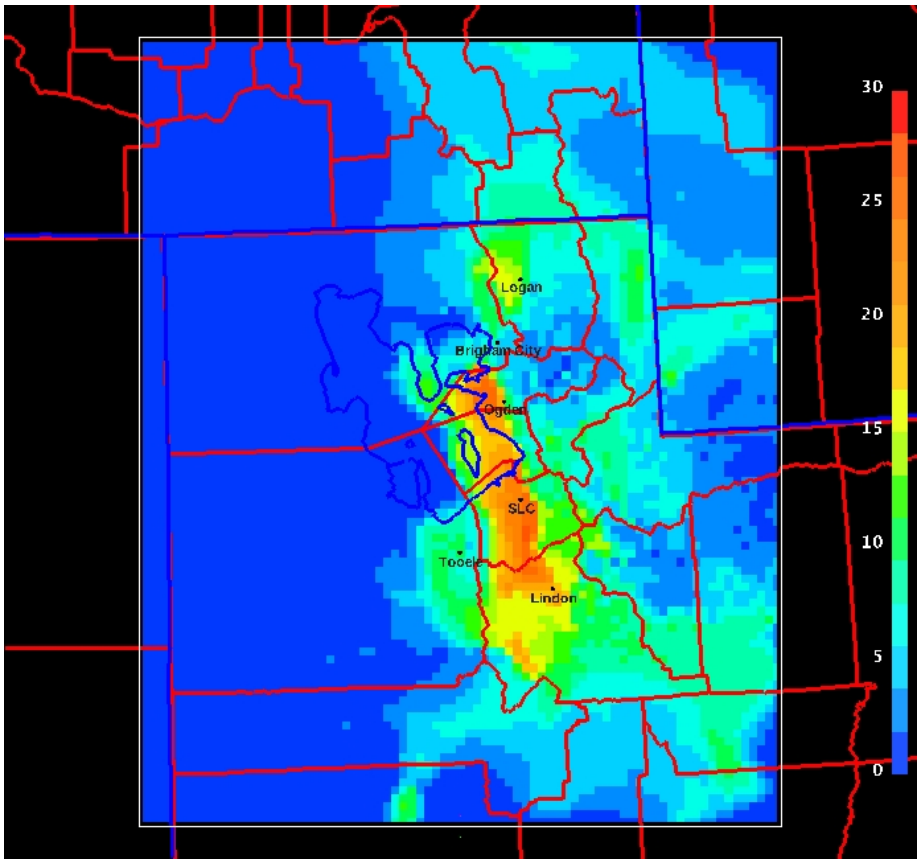


Figure 5.6: Spatial plot of CMAQ modeled 24-hr $PM_{2.5}$ ($\mu g/m^3$) for 2010 Jan. 03.

Time series of 24-hr $PM_{2.5}$ concentrations for the 13 Dec. 2009 – 15 Jan. 2010 modeling period are shown in Figs. 5.7 – 5.10 at the Hawthorne site in Salt Lake City (Fig. 5.7), the Ogden site in Weber County (Fig 5.8), the Lindon site in Utah County (Fig. 5.9), and the Logan site in Cache County (Fig. 5.10). For the most part, CMAQ replicates the buildup and washout of each individual episode. While CMAQ builds 24-hr $PM_{2.5}$ concentrations during the 08 Jan. – 14 Jan. 2010 episode, it was not able to produce the > 60 $\mu g/m^3$ concentrations observed at the monitoring locations.

It is often seen that CMAQ "washes" out the $PM_{2.5}$ episode a day or two earlier than that seen in the observations. For example, on the day 21 Dec. 2009, the concentration of $PM_{2.5}$ continues to build while CMAQ has already cleaned the valley basins of high $PM_{2.5}$ concentrations. At these times, the observed cold pool that holds the $PM_{2.5}$ is often very shallow and winds just above this cold pool are

southerly and strong before the approaching cold front. This situation is very difficult for a meteorological and photochemical model to reproduce. An example of this situation is shown in Fig. 5.11, where the lowest part of the Salt Lake Valley is still under a very shallow stable cold pool, yet higher elevations of the valley have already been cleared of the high $PM_{2.5}$ concentrations.

During the 24 – 30 Dec. 2009 episode, a weak meteorological disturbance brushes through the northernmost portion of Utah. It is noticeable in the observations at the Ogden monitor at 25 Dec. as $PM_{2.5}$ concentrations drop on this day before resuming an increase through Dec. 30. The meteorological model and thus CMAQ correctly pick up this disturbance, but completely clears out the building $PM_{2.5}$; and thus performance suffers at the most northern Utah monitors (e.g. Ogden, Logan). The monitors to the south (Hawthorne, Lindon) are not influence by this disturbance and building of $PM_{2.5}$ is replicated by CMAQ. This highlights another challenge of modeling $PM_{2.5}$ episodes in Utah. Often during cold pool events, weak disturbances will pass through Utah that will de-stabilize the valley inversion and cause a partial clear out of $PM_{2.5}$. However, the $PM_{2.5}$ is not completely cleared out, and after the disturbance exits, the valley inversion strengthens and the $PM_{2.5}$ concentrations continue to build. Typically, CMAQ completely mixes out the valley inversion during these weak disturbances.

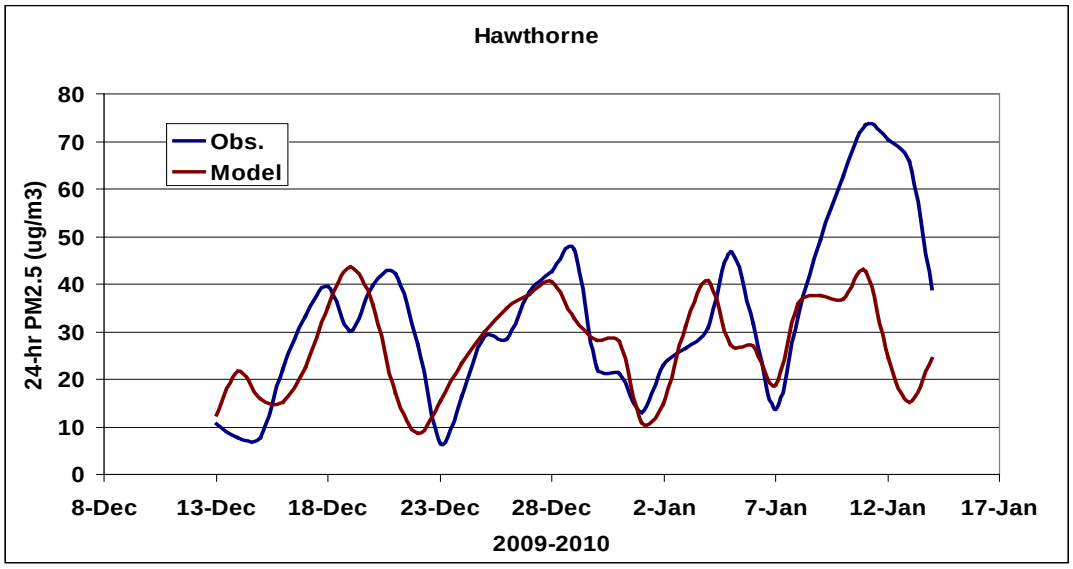


Figure 5.7: 24-hr PM2.5 time series (Hawthorne). Observed 24-hr PM2.5 (blue trace) and CMAQ modeled 24-hr PM2.5 (red trace).

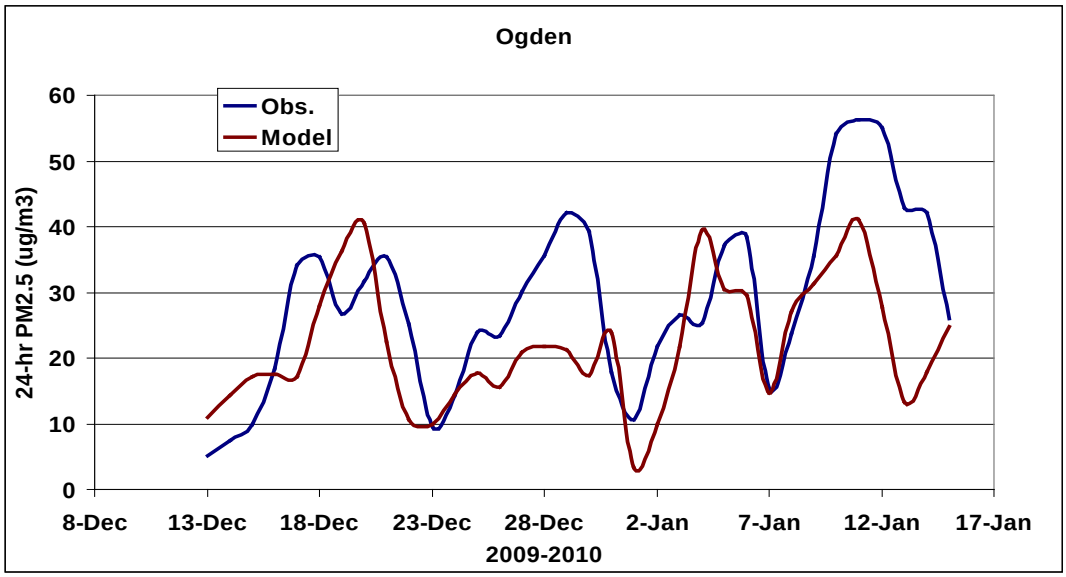


Figure 5.8: 24-hr $PM_{2.5}$ time series (Ogden). Observed 24-hr $PM_{2.5}$ (blue trace) and CMAQ modeled 24-hr $PM_{2.5}$ (red trace).

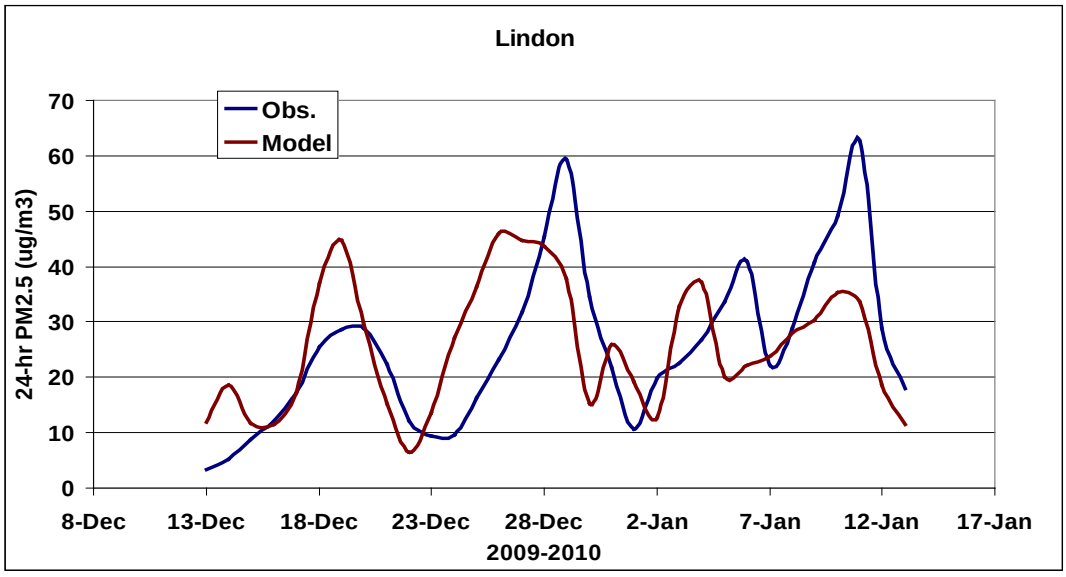


Figure 5.9: 24-hr $PM_{2.5}$ time series (Lindon). Observed 24-hr $PM_{2.5}$ (blue trace) and CMAQ modeled 24-hr $PM_{2.5}$ (red trace).

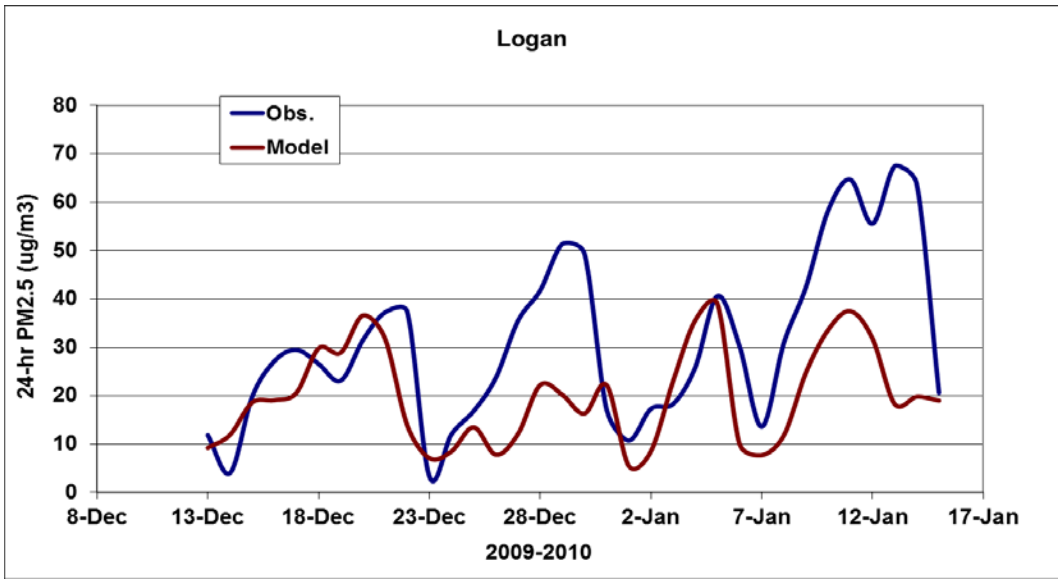


Figure 5.10: 24-hr $PM_{2.5}$ time series (Logan). Observed 24-hr $PM_{2.5}$ (blue trace) and CMAQ modeled 24-hr $PM_{2.5}$ (red trace).

Figure 5.11: An example of the Salt Lake Valley at the end of a high $PM_{2.5}$ episode. The lowest elevations of the Salt Lake Valley are still experiencing an inversion and elevated $PM_{2.5}$ concentrations while the $PM_{2.5}$ has been 'cleared out' throughout the rest of the valley. These 'end of episode' clear out periods are difficult to replicate in the photochemical model.

Generally, the performance of CMAQ to replicate the buildup and clear out of $PM_{2.5}$ is good. However, it is important to verify that CMAQ is replicating the components of $PM_{2.5}$ concentrations. $PM_{2.5}$ simulated and observed speciation is shown at the 3 STN sites in Figures 5.12 – 5.14. The observed speciation is constructed using days in which the STN filter 24-hr $PM_{2.5}$ concentration was > 35 µg/m^3. For the 2009-2010 modeling period, the observed speciation pie charts were created using 8 filter days at Hawthorne, 6 days at Lindon, and 4 days at Bountiful. The speciation of this small dataset appears similar to a comparison of a larger dataset of STN filter speciated data from 2005-2010 for high wintertime $PM_{2.5}$ days (see Figure 3.2 for one of these at Hawthorne).

The simulated speciation is constructed using modeling days that produced 24-hr $PM_{2.5}$ concentrations > 35 µg/m^3. Using this criterion, the simulated speciation pie chart is created from 18 modeling days for Hawthorne, 14 days at Lindon, and 14 days at Bountiful.

At all 3 STN sites, the percentage of simulated nitrate is greater than 40%, while the simulated ammonium percentage is at ~15%. This indicates that the model is able to replicate the secondarily formed particulates that typically make up the majority of the measured $PM_{2.5}$ on the STN filters during wintertime pollution events.

The percentage of model simulated organic carbon is ~13% at all STN sites, which is in agreement with the observed speciation of organic carbon at Hawthorne and slightly overestimated (by ~3%) at Lindon and Bountiful.

There is no STN site in the Logan nonattainment area, and very little speciation information available in the Cache Valley. Figure 5.15 shows the model simulated speciation at Logan. Ammonium (17%) and nitrate (56%) make up a higher percentage of the simulated $PM_{2.5}$ at Logan when compared to sites along the Wasatch Front.

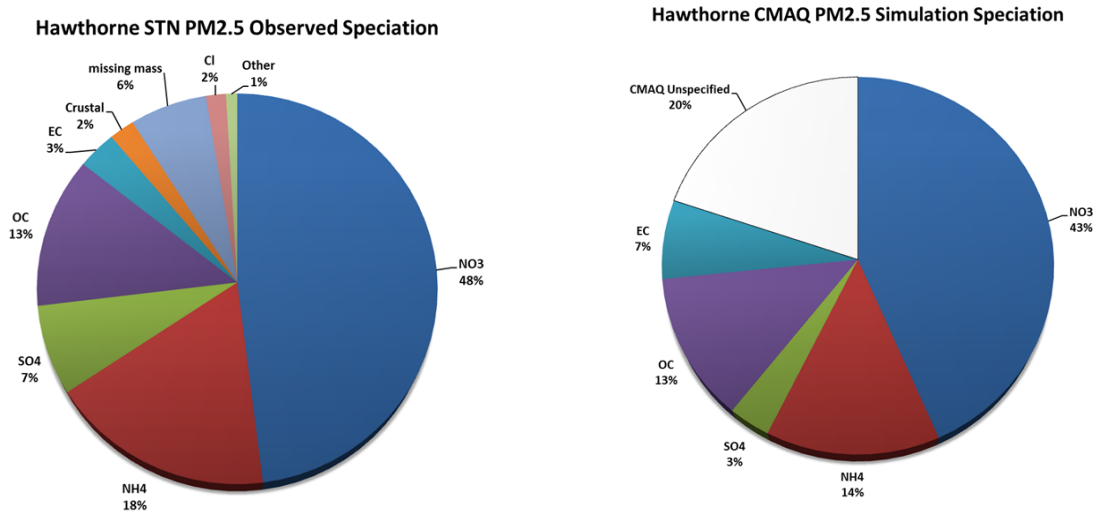


Figure 5.12: The composition of observed and model simulated average 24-hr $PM_{2.5}$ speciation averaged over days when an observed and modeled day had 24-hr concentrations > 35 µg/m^3 at the Hawthorne STN site.

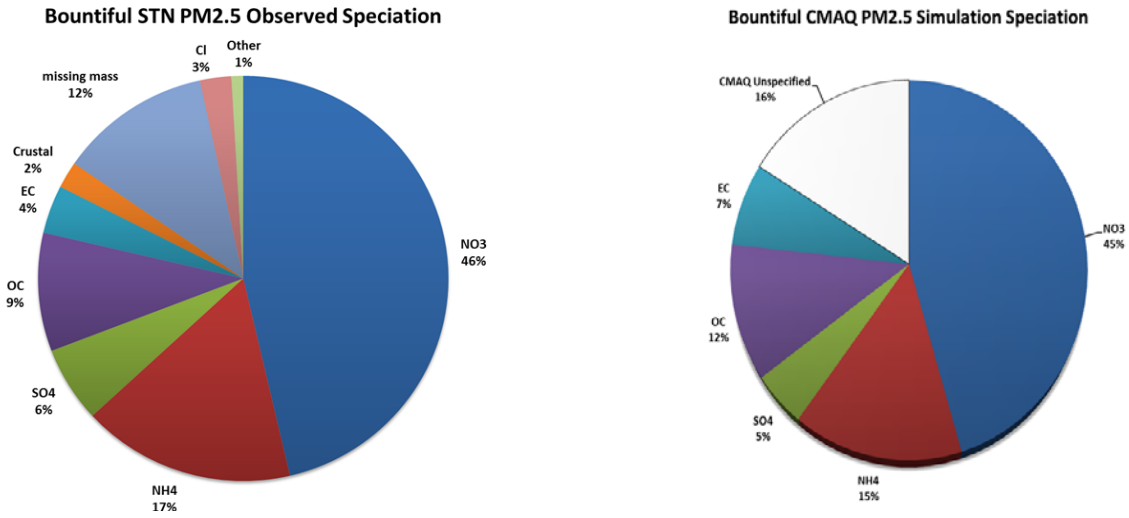


Figure 5.13: The composition of observed and model simulated average 24-hr $PM_{2.5}$ speciation averaged over days when an observed and modeled day had 24-hr concentrations > 35 µg/m^3 at the Bountiful STN site.

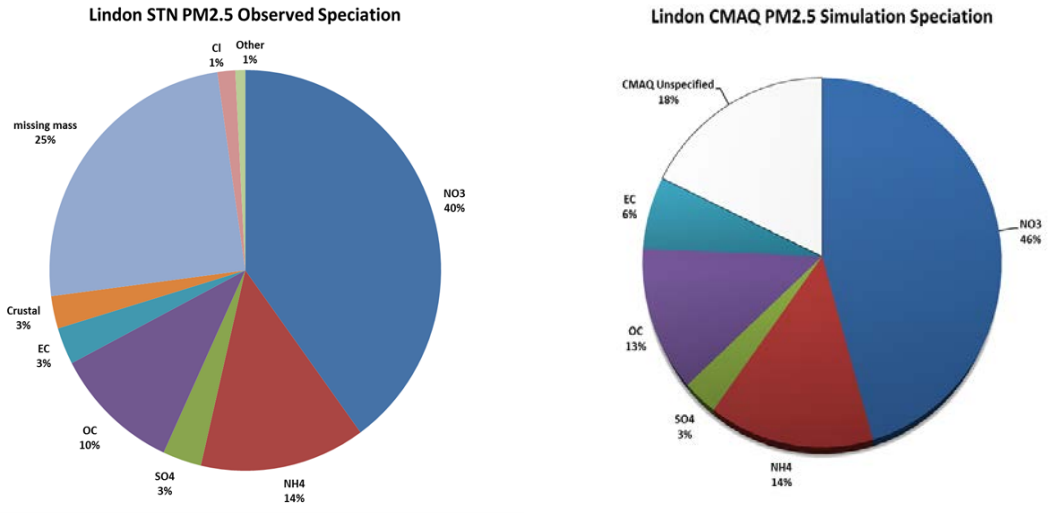


Figure 5.14: The composition of observed and model simulated average 24-hr $PM_{2.5}$ speciation averaged over days when an observed and modeled day had 24-hr concentrations > 35 µg/m^3 at the Lindon STN site.

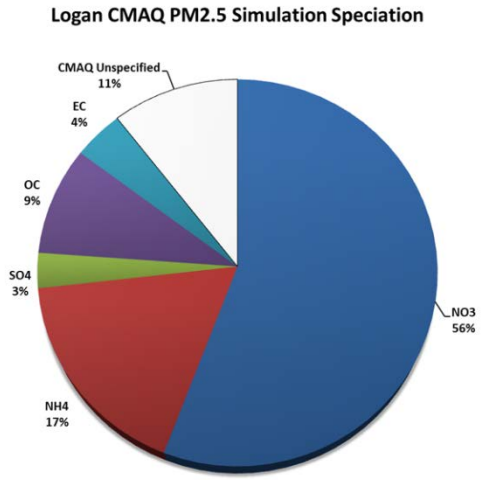


Figure 5.15: The composition of model simulated average 24-hr $PM_{2.5}$ speciation averaged over days when a modeled day had 24-hr concentrations > 35 µg/m^3 at the Logan monitoring site. No observed speciation data is available for Logan.

5.7 Summary of Model Performance

Model performance for 24-hr $PM_{2.5}$ is good and generally acceptable and can be characterized as follows:

- Good replication of the episodic buildup and clear out of $PM_{2.5}$. Often the model will clear out the simulated $PM_{2.5}$ a day too early at the end of an episode. This clear out time period is difficult to model (i.e., Figure 5.11).
- Good agreement in the magnitude of $PM_{2.5}$, as the model can consistently produce the high concentrations of $PM_{2.5}$ that coincide with observed high concentrations.
- Spatial patterns of modeled 24-hr $PM_{2.5}$, show for the most part, that the $PM_{2.5}$ is being confined in the valley basins, consistent to what is observed.
- Speciation and composition of the modeled $PM_{2.5}$ matches the observed speciation quite well. Modeled and observed nitrate are between 40% and 50% of the $PM_{2.5}$. Ammonium is between 15% and 20% for both modeled and observed $PM_{2.5}$, while modeled and observed organic carbon falls between 10% to 13% of the total $PM_{2.5}$.

Several observations should be noted on the implications of these model performance findings on the attainment modeling presented in the following section. First, it has been demonstrated that model performance overall is acceptable and, thus, the model can be used for air quality planning purposes. Second, consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA suggests that this approach "should reduce some of the uncertainty attendant with using absolute model predictions alone." Furthermore, the attainment modeling is supplemented by additional information to provide a weight of evidence determination.

5.8 Modeled Attainment Test

UDAQ employed Model Attainment Test Software (MATS) for the modeled attainment test at grid cells near monitors. MATS is designed to interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to the FRM monitors. The model also calculates the relative response factor (RRF) for grid cells near each monitor and uses these to calculate a future year design value for these cells.

MATS results for future year modeling is presented in Figure 5.16. The future year design values are presented with and without SIP controls for 2015 (the attainment year). For comparison purposes, the monitored design value is also presented for the base year, 2010.

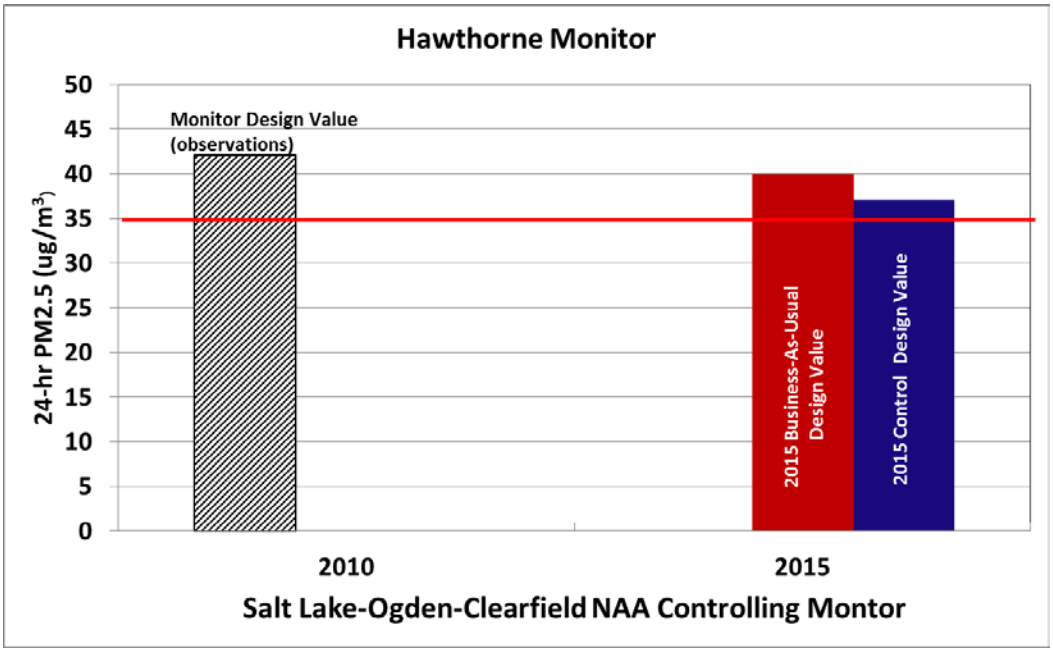


Figure 5.16, Model Results for the Salt Lake City, UT Nonattainment Area

Table 5.1 presents the same information in tabular form, and also includes any additional monitoring locations in the nonattainment area.

	2010	2015	
	Observed	Business-As-Usual	Control Basket
Bountiful	*37*	*34*	*32*
Brigham City	*40*	*34*	*31*
Harrisville	*35*	*33*	*30*
Hawthorne	*42*	*40*	*37*
Magna	*32*	*30*	*27*
Ogden 2	*38*	*35*	*33*
Rose Park	*39*	*38*	*34*
Tooele	*25*	*22*	*19*

Table 5.1, Modeled Concentrations (µg/m^3) for the Salt Lake City, UT Nonattainment Area

The "Control Basket" inventory that is presented in Table 5.1 consists of a combination of SIP reductions on point sources and new rules to be implemented that will affect smaller commercial and industrial businesses. All of these changes are detailed in Chapter 6 - Control Measures. Summary tables of the emission inventories that result from the Control Basket reductions are available in the TSD: Section 3 Baseline and Control Strategies.

5.9 Air Quality as of the Attainment Date

The attainment date for this moderate $PM_{2.5}$ nonattainment area is December 31, 2015. The plan provisions for moderate areas call, in Section 189(a)(1)(B), for either a demonstration that the plan will provide for attainment by the applicable attainment date or a demonstration that attainment by such date is impracticable.

As shown in the modeled attainment test, the emissions reductions achievable in 2015 do not allow for a demonstration that the Salt Lake City, UT nonattainment area can attain the 24-hour $PM_{2.5}$ NAAQS. Although predictions at seven of the eight monitors are less than 35 µg/m3, the predicted concentration at the Hawthorne monitor is still above the standard.

As discussed in Section 6.6, the emissions modeled in the “control basket” scenario reflect (at least) all RACM and RACT measures achievable in practice by the statutory implementation date (December 14, 2014). Therefore, what has been demonstrated is that attainment of the 24-hour standard by December 31, 2015 is impracticable.

Chapter 6 – CONTROL MEASURES

6.1 Introduction

Attaining the 2006, 24-hour NAAQS for $PM_{2.5}$ will require emission controls from directly emitted $PM_{2.5}$ as well as $PM_{2.5}$ precursors (SO_2, NO_x and VOC). It will involve emission sources from each of the four sectors identified in the discussion on emission inventories (stationary point sources, area sources, on-road mobile sources and off-road mobile sources). Furthermore, it will entail control measures of two basic types: existing measures; and measures imposed through this SIP.

This chapter summarizes the overall control strategy for the plan. Additional detail concerning individual emission control measures, including the emissions reductions to be expected, is contained in the Technical Support Document.

6.2 Utah Stakeholder Workgroup Efforts

In response to increasing interest in Utah's air quality problems and the need for greater participation in reducing air emissions, the Utah Division of Air Quality (DAQ) created a significant and meaningful role for public participation in the $PM_{2.5}$ SIP development process. The public involvement process was driven by a need for transparency and inclusivity of public health and business interests impacted by air quality issues.

DAQ's measures of success for the public involvement process were:

- Buy-in from public, stakeholders, and elected officials,
- SIP recommendations that are championed and implemented, and ;
- Close working relationship with partner organizations to deliver a unified message.

Measures of success for participants were:

- Having a say in plans that impacted their communities,
- Access to information and time to understand issues and provide input,
- Access to DAQ staff and the SIP development process,
- Meaningful participation in the process, and;
- Transparency of the process.

Public participation centered on creating workgroups with members from each county within the $PM_{2.5}$ nonattainment area—Box Elder, Cache, Davis, Salt Lake, Tooele, Utah, and Weber. More than 100 people from agriculture, academia, environmental groups, state and local elected officials, industry, and the public volunteered to participate. Their participation ensured that the SIP development process would have grassroots-level input about strategies and their impacts on a countywide level.

Workgroup members were engaged in four rounds of meetings created to provide and gather information. After providing a baseline level of knowledge during Meeting One, draft emissions reductions were discussed during Meetings Two and Three, each followed by a survey to capture new ideas and feedback. Responses from the survey, and other feedback received during the process, were used to refine emissions inventories, in some cases significantly, refine mitigation strategies, provide new strategies, and provide ideas for implementation. Meeting Four was an opportunity for workgroup members to introduce the SIP package to the public and talk about the development process before one of several public comment hearings held in the nonattainment counties.

The public participation process was not without challenges. One of the most difficult was providing information that could get a diverse group of stakeholders to understand very complex and technical air quality and emissions reductions issues. Despite the challenges, the process was successful and contributed to a well-rounded and well-vetted SIP package.

6.3 Identification of Measures

In considering the suite of control measures that could be implemented as part of this plan several important principles were applied to expedite the analysis.

Filter data shows that secondary particulate is the portion of mass most responsible for exceedances of the standard on episode days, and specifically shows that ammonium nitrate is the single largest component of that material. In addition, it shows that organic carbon represents the bulk of primary $PM_{2.5}$.

Priority was given to those source categories or pollutants responsible for relatively larger percentages of the emissions leading to exceedances of the $PM_{2.5}$ NAAQS. The emissions inventory compiled to represent base-year conditions was useful in identifying the contributors to these emissions, particularly in their relation to the formation of ammonium nitrate.

At the same time, the air quality modeling shed light on the sensitivity of the airshed in its response to changes in different pollutants. VOC was immediately identified as a significant contributor to elevated $PM_{2.5}$ concentrations, and proved to be more limiting in the overall atmospheric chemistry than NO_x. This pointed the search for viable control strategies toward VOC emissions, and somewhat away from NO_x. It also became apparent that directly emitted $PM_{2.5}$, while a relatively small portion of the overall filter mass, is independent of the non-linear chemical transformation to particulate matter. Therefore,

any reduction in $PM_{2.5}$ emissions will directly improve future $PM_{2.5}$ concentrations, and like VOC, made these emissions an attractive target for potential control measures. Subsequent modeling revealed that, as time progressed and the relative concentrations of NO_x and VOC changed, controlling for NO_x would yield more benefit in terms of controlling $PM_{2.5}$. Ammonia is also prominent in chemical reactions that produce secondary $PM_{2.5}$, but it occurs in such abundance that $PM_{2.5}$ concentrations are sensitive only to unachievable reductions in ammonia.

6.4 Existing Control Measures

Since about 1970 there have been regulations at both state and federal levels to mitigate air contaminants. It follows that the estimates of emissions used in modeled attainment demonstration for this Plan take into account the effectiveness of existing control measures. These measures affect not only the levels of current emissions, but some continue to affect emissions trends as well.

An example of the former would be the effectiveness of an add-on control device at a stationary point source. It is presently effective in controlling emissions, and will continue to be that effective five years from now.

An example of the latter would be a federal rule that affects the manufacture of engines. The engines already sold into the airshed are effective in reducing emissions, but the number of these engines replacing older, higher emitting engines is increasing. Therefore, a rule such as this also affects the trend of emissions for that source category in a positive way.

The effectiveness of any control measure that was in place, and enforceable, at the time this Plan was written has been accounted for in the tabulation of baseline emissions and projected emissions.

The following paragraphs discuss some of the more important control strategies that are already in place for the four basic sectors of the emissions inventory.

<u>Stationary Point Sources:</u>

Utah's permitting rules require a review of new and modified major stationary sources in nonattainment areas, as is required by Section 173 of the Clean Air Act. Beyond that however, even minor sources and minor modifications to major sources planning to locate anywhere in the state are required to undergo a new source review analysis and receive an approval order to construct. Part of this review is an analysis to ensure the application of Best Available Control Technology (BACT). This requirement is ongoing and ensures that Utah's industry is well controlled.

Along the central Wasatch Front, stationary sources were required to reduce emissions at several junctures to address nonattainment issues with SO_2, ozone and PM_{10}.

SIPs for ozone and SO_2 in 1981 each resulted in control of precursors to secondary particulate. There were SO_2 reductions at the copper smelter and VOC reductions at the refineries. In addition, Control Techniques Guideline documents (CTGs) affecting VOC emissions at a variety of industrial source categories were incorporated into Utah's air quality rules.

In the early 1990s, stationary sources were required to reduce PM_{10}, SO_2, and NO_x to address wintertime PM_{10} nonattainment.

Any of the source-specific emission controls or operating practices that has been required as a result of the forgoing has been reflected in the baseline emissions calculated for the large stationary sources, and therefore evaluated in the modeled demonstration.

Area sources:

Stage 1 vapor control was introduced in Salt Lake and Davis Counties as part of the 1981 ozone SIP. This is a method of collecting VOC vapors, as underground gasoline storage tanks are filled at gas stations, and returning those vapors to a facility where they are collected and recycled. Since that time it has been extended to include the entire state.

Part of the PM_{10} control for Salt Lake and Davis Counties in the early 1990s was a program to curtail woodsmoke emissions during periods of atmospheric stagnation. Woodsmoke is rich in VOC emissions in addition to the particulate matter which is almost entirely within the $PM_{2.5}$ size fraction. In 2006 the woodburning program was extended to include the western half of Weber County as well.

CTGs adopted into Utah's air quality rules to control VOC emissions in Salt Lake and Davis Counties, as part of the 1981 ozone SIP, are also effective in controlling emissions from area sources.

Energy Efficiency

EPA recognizes the benefits of including energy efficiency programs in SIP's as a low cost means of reducing emissions. Two established energy efficiency programs that result in direct emission reductions within the Wasatch Front are already in place.

Questar Gas ThermWise Rebate Programs

Questar started the ThermWise Rebate Programs on January 1, 2007 as a way to promote the use of energy-efficient appliances and practices among its customers. The ThermWise Programs offer rebates to help offset the initial cost of energy-efficient appliances and weatherization. There are also rebates available for energy efficient new construction. The cost of rebates is built into the Questar gas rate. The rebates are vetted by the Utah Public Service Commission's strict "cost-effectiveness" tests. To pass these tests, Questar must prove that the energy cost savings produced by the ThermWise Programs exceeds the cost of the rebates. There is no scheduled end to the ThermWise Programs. According to the Questar program information, the program will remain in place as long as rebates remain cost-effective.

UDAQ calculates area source emissions for natural gas by multiplying emission factors against actual and projected yearly gas usage data submitted by Questar. In this way, actual realized program reductions are expressed in the past year (baseline) emission inventory. Future investment in energy efficiency is not captured in our projected future gas usage. Continuance of this program will result in future gas emissions that are lower than projected.

Weatherization Assistance Program

The Weatherization Assistance Program helps low-income individuals and families reduce energy costs. Individuals, families, the elderly and the disabled who are making no more than 200 percent of the current federal poverty income level are eligible for help. However, priority is given to the elderly and disabled, households with high-energy consumption, emergency situations and homes with preschool-age children.

The Utah Division of Housing and Community Development administer the program statewide through eight government and nonprofit agencies. Benefits are provided in the form of noncash grants to eligible households to make energy-efficiency improvements to those homes.

The energy efficiency realized from this program is also imbedded within the gas usage data UDAQ receives from Questar.

On-road mobile sources:

The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that lead to $PM_{2.5}$. Since 1968, the program has required newer vehicles to meet ever more stringent emission standards for CO, NO_x, and VOC. Tier 1 standards were established in the early 1990s and were fully implemented by 1997. The Tier 1 emission standards can be found in Table 6.1. The EPA created a voluntary clean car program on January 7, 1998 (63 FR January 7, 1998), which was called the National Low Emission Vehicle (NLEV) program. This program asked auto manufacturers to commit to meet tailpipe standards for light duty vehicles that were more stringent than Tier 1 standards.

EPA Tier 1 Emission Standards for Passenger Cars and Light-Duty Trucks, FTP 75, g/mi

	100,000 miles/10 years[1]					
Category	**THC**	**NMHC**	**CO**	**NO_x[2] diesel**	***NO_x* *gasoline***	**PM[3]**
Passenger cars	-	0.31	4.2	1.25	*0.6*	0.1
LLDT, LVW <3,750 lbs	0.8	0.31	4.2	1.25	*0.6*	0.1
LLDT, LVW >3,750 lbs	0.8	0.4	5.5	0.97	*0.97*	0.1
HLDT, ALVW <5,750 lbs	0.8	0.46	6.4	0.98	*0.98*	0.1
HLDT, ALVW > 5,750 lbs	0.8	0.56	7.3	1.53	*1.53*	0.12

1 - Useful life 120,000 miles/11 years for all HLDT standards and for THC standards for LDT

2 - More relaxed NO_x limits for diesels applicable to vehicles through 2003 model year

3 - PM standards applicable to diesel vehicles only

Abbreviations:

LVW - loaded vehicle weight (curb weight + 300 lbs)

ALVW - adjusted LVW (the numerical average of the curb weight and the GVWR)

LLDT - light light-duty truck (below 6,000 lbs GVWR)

HLDT - heavy light-duty truck (above 6,000 lbs GVWR)

Table 6.1, Tier 1 Emission Standards

Shortly thereafter, EPA promulgated the Tier 2 program. This program went into effect on April 10, 2000 (65 FR 6698 February 10, 2000) and was phased in between 2004 and 2008. Tier 2 introduced more stringent numerical emission limits compared to the previous program (Tier 1). Tier 2 set a single set of standards for all light duty vehicles. The Tier 2 emission standards are structured into 8 permanent and 3 temporary certification levels of different stringency, called "certification bins," and an average fleet standard for NO_x emissions. Vehicle manufacturers have a choice to certify particular vehicles to any of the available bins. The program also required refiners to reduce gasoline sulfur levels nationwide, which was fully implemented in 2007. The sulfur levels need to be reduced so that Tier 2 vehicles could run correctly and maintain their effectiveness. The EPA estimated that the Tier 2 program will reduce oxides of nitrogen emissions by at least 2,220,000 tons per year nationwide in 2020[1]. Tier 2 has also contributed in reducing VOC and direct PM emissions from light duty vehicles. Tier 2 standards are summarized in Table 6.2 below.

Tier 2 Emission Standards, FTP 75, g/mi

Bin#	Full Useful Life				
	NMOG*	CO	NO_x†	PM	HCHO
Temporary Bins					
11 MDPV[c]	0.28	7.3	0.9	0.12	0.032
10[a,b,d]	0.156 (0.230)	4.2 (6.4)	0.6	0.08	0.018 (0.027)
9[a,b,e]	0.090 (0.180)	4.2	0.3	0.06	0.018
Permanent Bins					
8[b]	0.125 (0.156)	4.2	0.2	0.02	0.018
7	0.09	4.2	0.15	0.02	0.018
6	0.09	4.2	0.1	0.01	0.018
5	0.09	4.2	0.07	0.01	0.018
4	0.07	2.1	0.04	0.01	0.011
3	0.055	2.1	0.03	0.01	0.011
2	0.01	2.1	0.02	0.01	0.004
1	0	0	0	0	0

* for diesel fueled vehicle, NMOG (non-methane organic gases) means NMHC (non-methane hydrocarbons)

† average manufacturer fleet NO_x standard is 0.07 g/mi for Tier 2 vehicles

[1] 65 FR 6698 February 10, 2000

a - Bin deleted at end of 2006 model year (2008 for HLDTs)

b - The higher temporary NMOG, CO and HCHO values apply only to HLDTs and MDPVs and expire after 2008

c - An additional temporary bin restricted to MDPVs, expires after model year 2008

d - Optional temporary NMOG standard of 0.280 g/mi (full useful life) applies for qualifying LDT4s and MDPVs only

e - Optional temporary NMOG standard of 0.130 g/mi (full useful life) applies for qualifying LDT2s only

Abbreviations:

LDT2 – light duty trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)

LDT4 – light duty trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALVW)

MDPV – medium duty passenger vehicle

HLDT - heavy light duty truck (above 6,000 lbs GVWR)

Table 6.2, Tier 2 Emission Standards

In addition to the benefits from Tier 2 in the current emissions inventories, the emission projections for 2015 in this SIP continue to reflect significant improvements in both VOC and NO_x as older vehicles are replaced with Tier 2 vehicles. This trend may be seen in the inventory projections for on-road mobile sources despite the growth in vehicles and vehicle miles traveled that are factored into the same projections.

Additional on-road mobile source emissions improvement stemmed from federal regulations for heavy-duty diesel vehicles. The Highway Diesel Rule, which aimed at reducing pollution from heavy-duty diesel highway vehicles, was finalized in January 2001. Under the rule, beginning in 2007 (with a phase-in through 2010) heavy-duty diesel highway vehicle emissions were required to be reduced by as much 90 percent with a goal of complete fleet replacement by 2030. In order to enable the updated emission-reduction technologies necessitated by the rule, beginning in 2006 (with a phase-in through 2009) refiners were required to begin producing cleaner-burning ultra-low sulfur diesel fuel. Specifically, the rule required a 97 percent reduction in sulfur content from 500 parts per million (ppm) to 15 ppm. The overall nationwide effect of the rule is estimated to be equivalent to removing the pollution from over 90 percent of trucks and buses when the fleet turnover is completed in 2030.

To supplement the federal motor vehicle control program, Inspection / Maintenance (I/M) Programs were implemented in Salt Lake and Davis Counties in 1984. A program for Weber County was added in 1990. These programs have been effective in identifying vehicles that no longer meet the emission specifications for their respective makes and models, and in ensuring that those vehicles are repaired in a timely manner.

<u>Off-road mobile sources:</u>

Several significant regulatory programs enacted at the federal level will affect emissions from non-road mobile emission sources. This category of emitters includes airplanes, locomotives, hand-held engines, and larger portable engines such as generators and construction equipment. The effectiveness of these controls has been incorporated into the “NONROAD” model UDAQ uses to compile the inventory information for this source category. Thus, the controls have already been factored into the projection inventories used in the modeled attainment demonstration.

EPA rules for non-road equipment and vehicles are grouped into various "tiers" in a manner similar to the tiers established for on-road motor vehicles. To date, non-road rules have been promulgated for Tiers 0 through IV, where the oldest equipment group is designated "Tier 0" and the newest equipment, some of which has yet to be manufactured, falls into "Tier IV."

Of note are the following:

Locomotives

Locomotive engine regulation began with Tier 0 standards promulgated in 1998, which apply to model year 2001 engines.

In addition, because of the very long lifetimes of these engines, often up to forty years, Tier 0 standards include remanufacturing standards, which apply to locomotive engines of model years 1973 through 2001.

Subsequent tier standards for line-haul locomotives apply as follows:

Tier	Applicable Model Years
Tier I	2002 - 2004
Tier II	2005 - 2011
Tier III	2012 - 2014
Tier IV	2015 - newer

Yard or "switch" locomotives are regulated under different standards than line-haul locomotives.

Lastly, EPA has promulgated remanufacturing standards for Tier I and 2 locomotive engines to date.

Large Engines

Large non-road engines are usually diesel-powered but include some gasoline-powered equipment.

Large land-based diesel equipment (> 37 kw or 50 hp) used in agricultural, construction and industrial applications are regulated under Tier I rules, which apply to model years 1996 through 2000. Subsequent Tier II through IV rules apply to newer model-year equipment.

Some large non-road engines are gasoline-powered (spark-ignition). These include equipment such as forklifts, some airport ground support equipment, recreational equipment such as ATVs, motorcycles and snowmobiles. These are regulated under various tiers in a manner similar to diesel equipment.

Small Engines

Small engines are generally gasoline-powered (spark-ignition). Equipment includes handheld and larger non-handheld types. Handheld equipment includes lawn and garden power tools such as shrub trimmers, saws and dust blowers. Non-handheld equipment includes equipment such as lawnmowers and lawn tractors. From an emissions standpoint, smaller engine size is offset by the large number of pieces of equipment in use by households and commercial establishments. This equipment is regulated under a tiered structure as well.

Emissions Benefit

Each major revision of the non-road tier standards results in a large reduction of carbon monoxide, hydrocarbons, nitrogen oxides and particulate matter.

For example, the Non-road Diesel Tier II and III Rule, which regulates model-year 2001 through 2008 diesel equipment (> 37 kw or 50 hp) is estimated by EPA, in its Regulatory Announcement for this rule dated August 1998, to decrease NO_x emissions by a million tons per year by 2010, the equivalent of taking 35 million passenger cars off the road.

EPA further estimates, in its Regulatory Announcement dated May 2004, that the Tier IV non-road diesel rule is expected to decrease exhaust emissions per piece of equipment by over 90 percent compared to older equipment.

Low-Sulfur Diesel

Non-road diesel equipment is required to operate on diesel fuel with a sulfur content of no greater than 500 ppm beginning June 1, 2007.

Beginning June 1, 2010, non-road diesel equipment must operate on "ultra-low" sulfur diesel with a sulfur content of no more than 15 ppm.

Locomotives and certain marine engines must operate on ultra-low sulfur diesel by June 1, 2012.

6.5 SIP Controls

Beyond the benefits attributable to the controls already in place, there are new controls identified by this SIP that provide additional benefit toward reaching attainment. A summary of the plan strategy is presented here for each of the emission source sectors.

Overall, within the Salt Lake City – UT nonattainment area, the strategy to reduce emissions results in 27.4 tons per day of combined $PM_{2.5}$, SO_2, NO_x and VOC in 2015.

6.6 Reasonably Available Control Measures (RACM/RACT)

Section 172 of the CAA requires that each attainment plan "provide for the implementation of all reasonably available control measures (RACM) as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology (RACT)), and shall provide for attainment of the NAAQS."

Now that the Courts have determined that Subpart 4 applies to $PM_{2.5}$ nonattainment areas, it is also instructive to consider paragraph 189(a)(1)(C), which requires that "provisions to assure that reasonably available control measures … shall be implemented no later than … 4 years after designation in the case of an area classified as moderate after the date of the enactment of the Clean Air Act Amendments of 1990." All three of Utah's nonattainment areas for $PM_{2.5}$ were designated so on December 14, 2009. Hence, December 14, 2013 was the date by which all RACM was to have been implemented.

EPA interprets RACM as referring to measures of any type that may be applicable to a wide range of sources (mobile, area, or stationary), whereas RACT refers to measures applicable to stationary sources. Thus, RACT is a type of RACM specifically designed for stationary sources. For both RACT and RACM, potential control measures must be shown to be both technologically and economically feasible.

Pollutants to be addressed by States in establishing RACT and RACM limits in their $PM_{2.5}$ attainment plans will include primary $PM_{2.5}$ as well as precursors to $PM_{2.5}$. For the control strategy in this plan, those pollutants include SO_2, NO_x and VOC.

In general, the combined approach to RACT and RACM includes the following steps: 1) identification of potential measures that are reasonable, 2) modeling to test the control strategy, and 3) selection of RACT and RACM.

This basic process was applied to each of the four basic sectors of the emissions inventory:

<u>Stationary Point sources:</u>

Reasonably Available Control Technology – As stated above, RACT refers to measures applicable to stationary sources. Thus, RACT is a type of RACM specifically designed for stationary sources.

Section 172 does not include any specific applicability thresholds to identify the size of sources that States and EPA must consider in the RACT and RACM analysis. In developing the emissions inventories underlying the SIP, the criteria of 40 CFR 51 for air emissions reporting requirements was used to establish a 100 ton per year threshold for identifying a sub-group of stationary point sources that would be evaluated individually. The cut-off was applied to either a sources reported emissions for 2008 or for its potential to emit in a given year. The rest of the point sources were assumed to represent a portion of the overall area source inventory.

Sources meeting the criteria described above were individually evaluated to determine whether their operations would be consistent with RACT.

SIPs for $PM_{2.5}$ must assure that the RACT requirement is met, either through a new RACT determination or a certification that previously required RACT controls (e.g. for another pollutant such as PM_{10}) represent RACT for $PM_{2.5}$.

In conducting the analysis, UDAQ found that, as a whole, the large stationary sources were already operating with a high degree of emission control. It follows that the percentage of SIP related emissions reductions is not large relative to the overall quantity of emissions. As stated before, many of these sources were required to reduce emissions to address nonattainment issues with SO_2, ozone and PM_{10}. Routine permitting in these areas of nonattainment already includes BACT as an ongoing standard of review, even for minor sources and modifications. In order to find additional emission reductions at these sources, UDAQ identified a level of emission control that goes beyond reasonable, or RACT, and achieves the best available control.

Additional information regarding the RACT analysis for each of the sources in the nonattainment area may be found in the Technical Support Document.

For the Salt Lake City, UT nonattainment area, there are 28 stationary point sources that met or meet the criteria of 100 tons per year for $PM_{2.5}$ or any precursor. The emissions from these sources that were modeled for the 2010 baseline as well as the 2015 attainment year are shown below in Table 6.3.[1] Note that these emissions also include the growth projections that were applied. Information is provided in the TSD regarding the emissions reductions specific to reduction strategies resulting from the SIP.

[1] As noted above, the RACT implementation date given in CAA section 189(a)(1)(c), in Subpart 4, was December 14, 2013. As an editorial note, UDAQ had initially prepared this SIP under guidance pointing only to Subpart 1 of the CAA. That reading of the Act had resulted in a SIP with a different construct. It had identified an attainment date that was as expeditious as practicable, yet that date would have required all of the additional 5 years availed under section 172(a)(2)(A). Implementation of RACM and RACT, under that construct, was also to be as expeditious as practicable but in no case later that one year prior to the attainment date identified in the plan. Thus, RACT measures could have been implemented as late as December 14, 2018. Additionally, the requirement to address reasonable further progress (RFP) had identified two earlier milestones (2014 and 2017), and these presented additional targets for RACT implementation. Thus, the overall plan had incorporated a phased-in implementation schedule for measures identified as RACT.

When Subpart 4 superseded the more general planning requirements of Subpart 1, it was no longer permissible to request an extension of the attainment date. Instead, it became incumbent on the planning agency to determine either that the plan will provide for attainment by the applicable attainment date, or that attainment by such date is impracticable.

The attainment date for this moderate nonattainment area is December 31, 2015 and the RACT implementation date (having passed) was December 14, 2013. Many of the control strategies initially identified, under only Subpart 1, as RACT cannot be implemented by that prescribed date. This raises the question as to whether such measures would even be considered reasonable, either technologically or economically.

Nevertheless, UDAQ has retained this portion of the control strategy in the Emission Limits section of this State Implementation Plan. UDAQ is also demonstrating in this plan that attainment of the 2006, 24-hour NAAQS for $PM_{2.5}$ is impracticable by the attainment date. As part of that showing, the emissions reductions associated with all of the technologies and measures identified as RACT under only Subpart 1 were reflected in the emissions inventory modeled for the year 2015. This overstates the degree of control in 2015, however, from the standpoint of demonstrating that it is impracticable to attain the standard in 2015, provides a measure of conservatism to the overall conclusion.

Typical Winter Inversion Weekday Emissions (tpd)			2010_(R2) Baseline					2015_(R9) Growth & Control				
Source Category	NA-Area	Site	PM2.5	NOX	VOC	NH3	SO2	PM2_5	NOX	VOC	NH3	SO2
Point Sources	Salt Lake City, UT											
		ATK Thiokol Promontory	0.135	0.360	0.141	0.002	0.042	0.144	0.354	0.150	0.003	0.045
		Bountiful City Power	0.174	0.697	1.284	0.311	1.065	0.087	0.624	1.264	0.311	0.392
		Central Valley Water	0.000	0.005	0.001		0.000	0.082	0.209	0.049		0.002
		CER Generation II LLC - WVC	0.004	0.034	0.137	0.000	0.003	0.004	0.043	0.033	0.000	0.003
		Chemical Lime Company	0.015	0.039	0.005		0.002	0.015	0.039	0.005		0.002
		Chevron Refinery	0.036	0.043	0.001	0.000	0.034	0.008	0.058	0.002	0.000	0.044
		Flying J Refinery	0.501	2.991	0.663	0.026	1.774	0.105	1.950	1.234	0.022	1.092
		Geneva Rock Point of Mountain	0.069	0.269	0.050		0.037	0.084	0.323	0.060		0.026
		Great Salt Lake Minerals - Production Plant	0.132	0.249	0.023	0.002	0.018	0.107	0.304	0.061	0.003	0.026
		Hexcel Corporation Salt Lake Operations	0.048	0.217	0.180	0.079	0.024	0.103	0.102	0.111	0.129	0.009
		Hill Air Force Base Main	0.037	0.525	0.826	0.006	0.008	0.035	0.373	0.800	0.006	0.008
		Holly Refining Marketing	0.147	0.851	0.663	0.057	1.318	0.134	0.933	0.700	0.654	0.309
		Interstate Brick Brick	0.175	0.114	0.010		0.036					
		Kennecott Mine Concentrator	0.647	8.492	0.504	0.003	0.008	0.854	12.130	0.651	0.004	0.014
		Kennecott NC-UPP-Lab-Tailings	0.014	0.016	0.005	0.001	0.000	0.300	0.197	0.069	0.001	0.034
		Kennecott Smelter & Refinery	0.610	0.470	0.027	0.016	3.023	0.837	0.767	0.068	0.025	3.827
		Murray City Power	0.000	0.001	0.000		0.000					
		Nucor Steel	0.158	0.502	0.202	0.006	0.118	0.351	0.978	0.353	0.004	0.833
		Olympia Sales Co.	0.014	0.001	0.072	0.000	0.000	0.000	0.001	0.091	0.000	0.000
		Pacificorp Gadsby	0.067	0.443	0.031	0.065	0.006	0.067	0.437	0.031	0.065	0.006
		Pacificorp Little Mountain	0.021	1.014	0.007		0.011					
		Proctor & Gamble Paper Products Co.	0.099	0.043	0.067		0.003	0.575	0.674	0.654		0.007
		Silver Eagle Refining	0.011	0.246	0.359	0.012	0.003					
		Tesoro Refinery	0.710	1.162	0.806	0.011	2.808	0.272	1.297	1.005	0.010	0.819
		University of Utah	0.024	0.313	0.023	0.009	0.003	0.030	0.159	0.022	0.008	0.003
		Utility Trailer	0.002	0.117	0.215		0.001					
		Vulcraft	0.017	0.020	0.147	0.000	0.001	0.044	0.030	1.134	0.000	0.002
		Wasatch Integrated IE	0.019	0.903	0.033	0.039	0.292	0.024	0.832	0.042	0.049	0.371
		Salt Lake City, UT Total	**3.885**	**20.138**	**6.482**	**0.645**	**10.638**	**4.261**	**22.811**	**8.590**	**1.294**	**7.874**

Table 6.3, Point Source Emissions; Baseline and Projections with Growth and Control

New Source Review / Banked Emission Reduction Credits – Under Utah's new source review rules in R307-403-8, banking of emission reduction credits (ERCs) is permitted to the fullest extent allowed by applicable Federal Law as identified in 40 CFR 51, Appendix S, among other documents. Under Appendix S, Section IV.C.5, a permitting authority may allow banked ERCs to be used under the preconstruction review program (R307-403) as long as the banked ERCs are identified and accounted for in the SIP control strategy. In the past, Utah has accounted for existing banked ERCs in SIP control strategies, ensuring that a pool of ERCs was available for new or modified sources in nonattainment areas. For the $PM_{2.5}$ SIP, however, it was not possible to include banked ERCs in the attainment demonstration. The $PM_{2.5}$ SIP adopted by the Air Quality Board on December 4, 2013 did not include banked $PM_{2.5}$ or $PM_{2.5}$ precursor ERCs in the attainment demonstration[1] and therefore under R307-403-8 any ERCs that were banked prior to December 4, 2013 may not be used as $PM_{2.5}$ major source or major modification emission offsets for $PM_{2.5}$ nonattainment areas. The use of these existing banked ERCs to meet the requirements of existing SIPs for PM_{10}, SO_2 and ozone are not affected by the $PM_{2.5}$ SIP and would be evaluated according to the provisions of those SIPs. Any ERCs generated after December 4, 2013 for $PM_{2.5}$ or $PM_{2.5}$ precursors would have been accounted for in the $PM_{2.5}$ attainment demonstration and are eligible to be used as emission offsets for $PM_{2.5}$ or $PM_{2.5}$ precursors. DAQ has established a new registry for $PM_{2.5}$ ERCs generated after December 4, 2013 to ensure that qualifying ERCs are tracked.

Area sources:

The area source RACM analysis consisted of a thorough review of the entire area source inventory for anthropocentrically derived direct $PM_{2.5}$ and precursors constituents. There was no emission threshold level established in the review process; instead, the analysis centered on whether reasonable control measures are available for a given source category. The following table identifies these categories as well as the pollutant(s) likely to be controlled, and provides some remarks as to whether a control strategy was ultimately pursued. In considering what source categories might be considered, Utah made use of EPA recommendations included in Control Techniques Guideline Documents (CTG's), as well as control strategies from other states. DAQ evaluated each strategy for technical feasibility as part of the RACM analysis. The screening column in the table identifies whether or not a strategy was retained for rulemaking or screened out for impracticability.

[1] The SIP revision adopted by the Utah Air Quality Board on December 4, 2013 had demonstrated attainment by December 14, 2019. This SIP revision includes a demonstration under CAA Section 189(a)(1)(B) that it impracticable to attain the NAAQS in 2015. Banked emission credits were not included in this demonstration either.

Table 6.4 Area Source Strategy Screening

Strategy	Constituent(s)	Screening Status	Remarks
1. Repeal current surface coating rule, R307-340. Replace this rule with individual rules for each category. New rules include $PM_{2.5}$ nonattainment areas. New rules update applicability and control limits to most current CTG. Current rule includes, paper, fabric and vinyl, metal furniture, large appliance, magnet wire, flat wood, miscellaneous metal parts and graphic arts.	VOC	Retained	R307-340 previously applied to Davis and Salt Lake counties. R307-340 was withdrawn and re-enacted as separate rules for each existing category. The new rules were expanded to nonattainment areas and updated to the most current RACT based limit(s).
2. New separate surface coating rules for following sources: a. Aerospace b. High performance c. Architectural d. Marine e. Sheet, strip & coil f. Traffic markings g. Plastic parts	VOC	See Remarks Column	Aerospace – retained High performance – not retained, regulated under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Architectural – initially nor retained, further research indicated that adopting the Ozone Transport Commission model rule is feasible. Marine – not retained, only 1.2 tpy Sheet, strip & coil – retained Traffic markings – not retained, regulated under FIFRA Plastic parts - retained
3. Agricultural practices using Natural Resources Conservation Service (NRSC) practice standards	VOC, $PM_{2.5}$, ammonia	Not Retained	The NRCS has already enrolled most farmers in the erodible regions in their program thereby negating the need for rulemaking
4. Consumer products rule regulating VOC content	VOC	Retained	
5. Adhesives and sealant rule	VOC	Retained	
6. Expand current solvent degreasing rule R307-335 to $PM_{2.5}$ nonattainment areas and add a new section on industrial solvent cleaning	VOC	Retained	
7. Automobile refinishing rule	VOC	Retained	
8. Expand wood furniture manufacturing rule to $PM_{2.5}$ nonattainment areas. Update to most current CTG.	VOC	Retained	
9. Lower the no burn cut point for residential use of solid fuel burning devices. Require new sale of EPA certified stoves/fireplaces. Prohibit the sale/resale of noncertified stoves in nonattainment areas.	VOC, $PM_{2.5}$, NO_x, SO_x, ammonia	Retained	
10. Ban new sales of stick type outdoor wood boilers in nonattainment areas.	VOC, $PM_{2.5}$, NO_x, SO_x, ammonia	Retained	
11. Industrial bakery rule	VOC	Initially Retained	Screened out after analysis of public comment, cost benefit analysis does not support rulemaking, high cost-low VOC reduction
12. Restaurant charbroiler emission control: - Chain-driven -Underfire	VOC, $PM_{2.5}$	Chain-driven Retained Underfire-Not Retained	No reasonable control measures available at this time for underfire charbroiling
13. Appliance pilot light phase out	VOC, $PM_{2.5}$,	Retained	

Strategy	Constituent(s)	Screening Status	Remarks
	NO_x, SO_x, ammonia		
14. Expand current fugitive dust rule, R307-309 to $PM_{2.5}$ nonattainment areas. Require BMP's for dust plans.	$PM_{2.5}$	Retained	
15. Amend fugitive dust rule to include cattle feed lot	$PM_{2.5}$	Not Retained	Sizeable feed lots are not located in nonattainment areas
16. Ultra-low NO_x burners in commercial, industrial, and institutional boilers	NO_x	Tentatively Retained for Future Consideration	Developing technology not readily available at this time
17. Ultra-low NO_x burners in water heaters	NO_x	Tentatively Retained for Future Consideration	High cost and availability concerns
18. Manure management	VOC, ammonia	Not Retained	NRCS best management practices already encourages manure management. Limited viable options during winter months and treatment options are costly with low control efficiency that would not yield significant ammonia reduction in an ammonia rich inventory
19. Ban testing of back-up generators on red-alert days	VOC, $PM_{2.5}$, NO_x, SO_x	Initially Retained	Screened out after review of public comment, rule implementation was more complicated than anticipated, generators cannot be easily re-programmed
20. Prohibit use of cutback asphalt	VOC	Not Retained	Cities and highway administration personnel need stockpile for winter time road repair. Very small inventory.
21. Control limits on aggregate processing operations and asphalt manufacturing	$PM_{2.5}$, NO_x, SO_x	Retained	
22. R307-307 Road Salt and Sanding	PM	Retained	Expand current rule to nonattainment areas

EPA published CTGs and Alternative Control Techniques documents (ACTs) for VOCs for a host of emission sources. The CTGs are used to presumptively define VOC RACT. The VOC ACTs describe available control techniques and their cost effectiveness, but do not define presumptive RACT levels as the CTGs do. Therefore, CTG's are given highest priority in rule development.

Where a CTG does not exist for an emission source or where a CTG is so dated that it no longer represents current industry practice, UDAQ considered rules from other states as reference sources.

Additional reference sources include the Ozone Transport Commission (OTC) and the Northeast States for Coordinated Air Use Management.

As noted above, many CTGs were previously adopted into Utah's air quality rules to address ozone nonattainment in Salt Lake and Davis Counties. In conducting this evaluation, consideration was given to whether an expansion of applicability for an existing CTG into additional counties would provide a benefit for $PM_{2.5}$, and whether a strengthening of existing CTG requirements in Salt Lake and Davis Counties would result in an incremental benefit that was economically feasible. Furthermore, EPA has updated some of its existing CTGs and added some new ones to the list.

As part of this SIP, Utah has identified relevant source categories covered by CTGs, and promulgated rules based on the CTGs for reducing emissions from these categories. These rules apply to the following source categories:

- Control of Volatile Organic Emissions from Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks
- Control of Volatile Organic Emissions from Solvent Metal Cleaning
- Control of Volatile Organic Emissions from Surface Coating of Insulation of Magnet Wire
- Control of Volatile Organic Emissions from Graphic Arts
- Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations
- Control Techniques Guidelines for Industrial Cleaning Solvents
- Control Techniques Guidelines for Flat Wood Paneling Coatings
- Control Techniques Guidelines for Paper, Film, and Foil Coatings
- Control Techniques Guidelines for Large Appliance Coatings
- Control Techniques Guidelines for Metal Furniture Coatings
- Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings
- Control of Volatile Organic Emissions from Coating Operations at Aerospace Manufacturing and Rework Operations

While most VOC sources are addressed by CTGs, the remaining emission sources must be evaluated by engineering analysis, including an evaluation of rulings by other states including model rules developed by the Ozone Transport Commission. These include VOCs from autobody refinishing, restaurant charbroiling, and phasing out appliance pilot lights.

CTGs for $PM_{2.5}$ emissions sources do not exist. RACT for $PM_{2.5}$ has been established through information from varied EPA and other state SIP sources. A useful source of data is the AP 42 Compilation of Air Pollutant Emission Factors, first published by the US Public Health Service in 1968. In 1972, it was revised and issued as the second edition by the EPA. The emission factor/control information was applied to fugitive dust and mining strategies.

Table 6.5 shows the effectiveness of the area source SIP control strategy for the Salt Lake City, UT nonattainment area by indicating the quantities of emissions eliminated from the inventory in 2015. Most of these rules became effective January 1, 2014.

Salt Lake City, UT Nonattainment Area				
	2015 lbs/day reduced			
	NOX	PM2.5	SOX	VOC
Area Source Rules				
R307-302, Solid fuel burning	632	5,114	105	6,400
R307-303, Commercial cooking		361		93
R307-309, Fugitive dust		191		
R307-312, Aggregate processing operations		5		
R307-335, Degreasing				2,908
R307-342, Adhesives & sealants				2,112
R307-343, Wood manufacturing				1,146
R307-344, Paper, film & foil coating				1,244
R307-345, Fabric & vinyl coating				2,887
R307-346, Metal furniture coating				95
R307-347, Large appliance coating				3
R307-348, Magnet wire coating				9
R307-349, Flat wood panel coating				73
R307-350 Miscellaneous metal parts coating				2,522
machinery				143
other transportation				447
Special				4
R307-351, Graphic arts				1,917
R307-352, Metal containers				180
R307-353, Plastic coating				1,098
R307-354, Auto body refinishing				2,485
R307-355, Aerospace coatings				718
R307-356, Appliance pilot light	877	4	6	51
R307-357, Consumer products				3,637
R307-361, Architectural coatings				8,038
Grand Totals	**1,584**	**6,276**	**123**	**38,964**

Table 6.5, Emissions Reductions from Area Source SIP Controls

On-road mobile sources:

A decentralized, test-and-repair program was evaluated for Box Elder and Tooele counties within the nonattainment area. For the evaluation, all model year 1968 and newer vehicles would be subject to a biennial test except for exempt vehicles. The program would exempt vehicles less than four years old as of January 1 on any given year from an emissions inspection. Year 1996 and newer vehicles would be subject to an On-Board Diagnostics (OBD) inspection. Year 1995 and older vehicles would be subject to a two-speed idle inspection (TSI). Based on this evaluation, this program was not included because it was determined that implementation of such a program would not affect PM 2.5 concentrations at the controlling monitor (Hawthorne) for the Salt Lake-Ogden-Clearfield nonattainment area. Additional information is provided in the Technical Support Document.

Off-road mobile sources:

Beyond the existing controls reflected in the projection-year inventories and the air quality modeling there are no emission controls that would apply to this source category.

Chapter 7 – TRANSPORTATION CONFORMITY

7.1 Introduction

The federal Clean Air Act (CAA) requires that transportation plans and programs within the Salt Lake City, Utah $PM_{2.5}$ nonattainment area conform to the air quality plans in the region prior to being approved by the Wasatch Front Regional Council (WFRC) Metropolitan Planning Organization. Demonstration of transportation conformity is a condition to receive federal funding for transportation activities that are consistent with air quality goals established in the Utah State Implementation Plan (SIP). Transportation conformity requirements are intended to ensure that transportation activities do not interfere with air quality progress. Conformity applies to on-road mobile source emissions from regional transportation plans (RTPs), transportation improvement programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet or previously have not met the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, particulate matter less than 10 micrometers in diameter (PM_{10}), particulate matter 2.5 micrometers in diameter or less ($PM_{2.5}$), or nitrogen dioxide.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFTEA-LU) and section 176(c)(2)(A) of the CAA require that all regionally significant highway and transit projects in air quality nonattainment areas be derived from a "conforming" transportation plan. Section 176(c) of the CAA requires that transportation plans, programs, and projects conform to applicable air quality plans before being approved by an MPO. Conformity to an implementation plan means that proposed activities must not (1) cause or contribute to any new violation of any standard in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The plans and programs produced by the transportation planning process of the WFRC are required to conform to the on-road mobile source emissions budgets established in the SIP, or absent an approved or adequate budget, required to meet the interim conformity test. Approval of conformity is determined by the FHWA and FTA.

7.2 Consultation

The Interagency Consultation Team (ICT) is an air quality workgroup in Utah that makes technical and policy recommendations regarding transportation conformity issues related to the SIP development and transportation planning process. Section XII of the Utah SIP established the ICT workgroup and defines the roles and responsibilities of the participating agencies. Members of the ICT workgroup collaborated on a regular basis during the development of the $PM_{2.5}$ SIP. They also meet on a regular basis regarding transportation conformity and air quality issues. The ICT workgroup is comprised of management and technical staff members from the affected agencies associated directly with transportation conformity.

ICT Workgroup Agencies

- Utah Division of Air Quality (UDAQ)
- Metropolitan Planning Organizations MPOs
  - Cache MPO
  - Wasatch Front Regional Council
  - Mountainland Association of Governments
- Utah Department of Transportation (UDOT)
- Utah Local Public Transit Agencies
- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA)
- U.S. Environmental Protection Agency (EPA)

During the SIP development process the WFRC coordinated with the ICT workgroup and developed $PM_{2.5}$ SIP motor vehicle emissions inventories using the latest planning assumptions and tools for traffic analysis and the EPA-approved Motor Vehicle Emission Simulator (MOVES2010) emissions model. Local MOVES2010 modeling data inputs were cooperatively developed by WFRC and the ICT workgroup using EPA-recommended methods where applicable.

7.3 Regional Emission Analysis

The regional emissions analysis is the primary component of transportation conformity and is administered by the lead transportation agency located in the EPA designated air quality nonattainment area. In December 2009, EPA designated all of Davis and Salt Lake Counties and parts of Box Elder, Tooele, and Weber as the Salt Lake City, Utah $PM_{2.5}$ nonattainment area. The Deadlines Rule (signed April 25, 2014) later classified this as a moderate $PM_{2.5}$ nonattainment area. The responsible transportation planning organization for the Salt Lake City, UT nonattainment area is the Wasatch Front Regional Council (WFRC).

As a condition to receive federal transportation funding, transportation plans, programs, and projects are required to meet the criteria and procedures for demonstrating and assuring conformity to the applicable implementation plan developed pursuant to Section 110 and Part D of the CAA. The criteria, specified in 40 CFR 93.109, differ based on the action under review and the status of the

implementation plan. The satisfaction of criteria and procedures, for implementation plans submitted under Section 189(a)(1)(B)(ii) of the CAA, which demonstrate the impracticability of demonstrating attainment of the applicable NAAQS by the applicable attainment date, are addressed in paragraph 93.109(g)(4) of the conformity rule. For such implementation plan revisions, it is the interim emissions tests which must be satisfied, as specified in Section 93.119.

7.4 Interim $PM_{2.5}$ Conformity Test

The EPA interim conformity test, for the purposes of this plan revision, will require that NOx, VOC, and direct $PM_{2.5}$ (elemental carbon, organic carbon, SO_4, brake and tire wear) emissions from RTPs, TIPs, and projects funded or approved by the FHWA or the FTA not exceed 2008 levels.

VOC is included because UDAQ has identified volatile organic compounds (VOCs) as a $PM_{2.5}$ precursor that significantly impacts $PM_{2.5}$ concentrations.

The EPA conformity rule presumes that $PM_{2.5}$ re-entrained road dust does not need to be included in the interim conformity test unless either the State or EPA decides that re-entrained road dust emissions are a significant contributor to the $PM_{2.5}$ nonattainment problem. The UDAQ conducted a re-entrained road dust study that concluded that $PM_{2.5}$ re-entrained road dust emissions are negligible in the Salt Lake City, Utah $PM_{2.5}$ nonattainment area, and thus meet the criteria of 40 CFR 93.102(b)(3). EPA Region 8 reviewed the study and concurred with the UDAQ's findings.

Chapter 8 – REASONABLE FURTHER PROGRESS

8.1 Introduction

Clean Air Act Section 172(c)(2) requires that plans for nonattainment areas "shall require reasonable further progress (RFP)." The definition of RFP is given in Section 171 of the CAA. It means "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date."

In general terms, the goal of these RFP requirements is for areas to achieve generally linear progress toward attainment, as opposed to deferring implementation of all measures, where possible, until the end.

The pollutants to be addressed in the RFP plan are those pollutants that are identified for purposes of control measures in the attainment plan: $PM_{2.5}$, SO_2, NOx, and VOC.

8.2 Moderate Area Planning Requirements

Within the context of the moderate area planning requirements given in Subparts 1 and 4 of the CAA, RFP must be considered in light of the attainment date as well as the date by which all RACT and RACM must be implemented. The attainment date for all three of Utah's moderate $PM_{2.5}$ nonattainment areas was established in EPA's Deadlines Rule. That date is December 31, 2015. The deadline for implementation of all RACT and RACM is described in paragraph 189(a)(1)(C) as four years from the date these areas were designated nonattainment. That date for implementation of RACM was thus December 14, 2013.

There are other moderate area planning requirements in Subpart 4 that relate to the showing of RFP. Paragraph 189(a)(1)(B) requires "either (i) a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment date; or (ii) a demonstration that attainment by such date is impracticable."

This plan demonstrates the latter; that despite the implementation of all reasonably available controls, the area still will not attain the 2006, 24-hour standard for $PM_{2.5}$ by December 31, 2015.

Paragraph 189(c) discusses "milestones … which demonstrate reasonable further progress … toward attainment by the applicable date," but these are to be submitted with "plan revisions demonstrating attainment." Since this plan does not demonstrate attainment, the RFP showing will instead be addressed herein, as part of this plan revision.

8.3 RFP for the Salt Lake City, UT Nonattainment Area

Past Guidance on RFP, for showing generally linear progress towards attainment by the applicable attainment date, has described a straight line with a downward trend, ending at the attainment date and representing, there, a level of emissions that is consistent with attainment of the applicable NAAQS.

Since this plan does not show attainment of the standard by the attainment date (December 31, 2015), and furthermore does not show when or how attainment might be achieved, the "reductions in emissions of the relevant air pollutant as are required by this part" are left undefined. In terms of the straight line, the drop of the line, over its length, is an unknown quantity.

Furthermore, since $PM_{2.5}$ has a secondary component born of non-linear chemical reactions involving precursor gasses, it is not practical to extrapolate what reductions in which emissions would be necessary to attain the standard at some future date.

The magnitude then, for this plan revision, of emissions reductions required for a showing of RFP, must have the meaning of those that "may reasonably be required by the Administrator."

Since RFP considers the overall magnitude of emissions reductions "for the purpose of ensuring attainment … by the applicable date," it is also necessary to define a period of time over which this determination will be made.

The starting point for evaluating RFP should be the baseline year used in the modeling analysis. This is a year (2010) selected to coincide with the period used to establish the monitored design value for the modeling analysis; a period in which the area is violating the applicable NAAQS.

Thus, the magnitude of emissions reductions should be evaluated over a period spanning from 2010 through 2015, though it should be recognized that meaningful SIP controls were not required until 2014.

Quantitatively, the following assessment of emissions and incremental emissions reductions in Table 8.1 will show that RFP is met using the criteria discussed above:

Reasonable Further Progress							
Salt Lake City, UT PM2.5 Nonattainment Area							
*Emissions / Year	2010		2015		Difference		RFP
			projected with growth and controls				Annualized Difference
PM2.5	~~16.5~~		~~15.1~~		~~1.4~~		~~0.3~~
NOx	~~160.5~~		~~135.1~~		~~25.4~~		~~5.1~~
SO2	~~12.8~~		~~10.1~~		~~2.7~~		~~0.5~~
VOC	~~130.0~~		~~102.4~~		~~27.6~~		~~5.5~~
Plan precursors	~~303.3~~		~~247.6~~		~~55.7~~		~~11.1~~
Total	~~319.8~~		~~262.7~~		~~57.1~~		~~11.4~~
**Concentration (ug/m3)	42		37		5.0		1.0
* Emissions are presented in tons per average winter day							
**Value for 2010 is Baseline design value for the Hawthorne monitor							

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Reasonable Further Progress							
Salt Lake City, UT PM2.5 Nonattainment Area							
*Emissions / Year	2010		2015 projected with growth and controls		Difference		RFP Annualized Difference
PM2.5	19.6		18.8		0.8		0.2
NOx	160.5		140.8		19.7		3.9
SO2	12.8		18.3		-5.5		-1.1
VOC	130.0		102.5		27.5		5.5
Plan precursors	303.3		261.6		41.7		8.3
Total	323.0		280.5		42.5		8.5
**Concentration (ug/m3)	42		37		5.0		1.0
* Emissions are presented in tons per average winter day							
**Value for 2010 is Baseline design value for the Hawthorne monitor							

Table 8.1, Reasonable Further Progress in the Salt Lake City, UT nonattainment area

In addition to the emissions totals, the table also includes the 2010 baseline design value for the controlling monitor in the nonattainment area (Hawthorne) and the predicted $PM_{2.5}$ concentration in 2015. These concentrations are presented as another metric to establish progress toward meeting the 24-hour standard.

Control Measures

The inventory for 2015 "with growth and controls" reflects the implementation of all the reasonably available control measures and reasonably available control technologies identified in this plan (up to and beyond the attainment date[1]), as well as all pre-existing control measures. As such, this inventory takes into account all controls that "may reasonably be required by the Administrator."

[1] The RACT measures for stationary sources include controls to be implemented past the implementation date of December 14, 2013. For reasons articulated in section 6.6 of this plan, these measures were retained in transitioning from the planning requirements of only Subpart 1 to those also including Subpart 4. These additional measures are not relied upon for a showing of attainment. Rather, their inclusion in the modeling analysis underscores that attainment by December 31, 2015 is impracticable. For the purposes of RFP however, it is not appropriate to include the effectiveness of control measures with implementation dates not required until after the attainment date (December 31, 2015.) Thus, the 2015 emissions shown in Table 8.1 differ from the emissions shown in Table 4.2 by the amount of these controls. Nevertheless, from a qualitative standpoint, their inclusion in

For a complete discussion of RACM & RACT, and the control measures factored into the modeled demonstration for 2015, see Chapter 6 of the Plan.

the Emission Limitations portion of this plan also underscores the fact that this plan continues to require measures to further the progress toward attainment, even beyond the applicable attainment date.

Chapter 9 – CONTINGENCY MEASURES

9.1 Background

Consistent with section 172(c)(9) of the Act, the State must submit in each attainment plan specific contingency measures to be undertaken if the area fails to make reasonable further progress, or fails to attain the $PM_{2.5}$ NAAQS by its attainment date. The contingency measures must take effect without significant further action by the State or EPA.

Nothing in the statute precludes a State from implementing such measures before they are triggered, but the credit for a contingency measure may not be used in either the attainment or reasonable further progress demonstrations.

The SIP should contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented without further action by the State or by EPA.

The CAA does not include the specific level of emission reductions that must be adopted to meet the contingency measures requirement under section 172(c)(9). Nevertheless, in the preamble to the Clean Air Fine Particulate Rule (see 72 FR 20643) EPA recommends that the "emissions reductions anticipated by the contingency measures should be equal to approximately 1 year's worth of emissions reductions necessary to achieve RFP for the area."

9.2 Contingency Measures and Implementation Schedules for the Nonattainment Area

The following measures have been set aside for contingency purposes:

Woodburning Control – As part of the control strategy for the SIP, rule R307-302 has been amended to change the no-burn call from 35 $\mu g/m^3$ to 25 $\mu g/m^3$. Credit for this change is included in the modeled attainment demonstration as well as the RFP demonstration. However, R307-302 also includes a mechanism to further revise the no-burn call to only 15 $\mu g/m^3$ should a contingency situation arise. The benefit of this rule is to prevent a buildup of particulate matter due to woodsmoke during periods of poor atmospheric mixing which typically precede exceedances of the 24-hour $PM_{2.5}$ NAAQS. This rule has been adopted, and can take effect immediately if so required.

This contingency measure will be triggered by an EPA determination that: 1) the area has failed to make RFP; or 2) has failed to attain the NAAQS by the applicable attainment date.

9.3 Conclusions

Control measures developed to meet increasingly stringent ozone and fine $PM_{2.5}$ standards in Utah's urbanized areas have likewise become increasingly stringent, and still it is a challenge to attain the 2006, $PM_{2.5}$ NAAQS. This leaves little room for additional reductions that can be set aside as contingency measures.

The control strategy analysis summarized in Chapter 6 shows that stationary sources already meet or exceed RACT, and represent at most about 20% of the emissions contributing to excessive $PM_{2.5}$ concentrations during winter. By contrast, area sources and on-road mobile sources contribute most of the emissions, but further emission control in these categories extends beyond the authorities of UDAQ. The most meaningful reductions in future emissions of VOC, an important $PM_{2.5}$ precursor, will likely result from additional restrictions of VOC in consumer products, and from what will likely result from Tier 3 of the federal motor vehicle control program.

PM2.5 SIP Sections IX.A.21, IX.A.22, IX.A.23 and SIP Sections IX.H.11, 12 and 13: Comments and Responses to Comments Made During the October 2014 Public Comment Period.

November 19, 2014

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General SIP Comments

Comment G-1 (From EPA Cover Letter of Comments): EPA wishes to clarify that the SIPs will need to meet all Moderate area plan requirements even if the nonattainment areas are re-classified as Serious areas in the future. In that event, Serious area plan requirements will not replace Moderate area plan requirements. Instead, Serious area plan requirements will be in addition to Moderate area plan requirements.

DAQ Response: The comment raises an interesting question, and perhaps, in EPA's forthcoming proposal of a new $PM_{2.5}$ implementation rule[1] this will be addressed.

In that forum, comment may be taken, and a final rule can make the answer to this question clear for all to read.

Until then, Region 8 appears to be offering an opinion, and nothing more.

EPA Region 9 offered its interpretation as part of its proposal to promulgate a Federal Implementation Plan for the Arizona-Phoenix nonattainment area (FR Vol. 63, No. 62, April 1, 1998, pp. 15926), writing: "EPA believes that because Maricopa area was reclassified from a moderate to a serious nonattainment area, the moderate area attainment requirements (demonstration of impracticability or attainment by no later than December 31, 1994) have been superseded by the serious area attainment requirement (attainment by no later than December 31, 2001) and are therefore now moot. Having reviewed the CAA's moderate and serious area PM-10 attainment provisions, EPA has concluded that when a moderate PM-10 area has been reclassified after the moderate area attainment deadline has passed and been replaced with a new deadline, the moderate area deadline no longer has any logical, practical or legal significance. Similarly, once such a reclassification has occurred, the approval status of the SIP provisions addressing the previous attainment requirements is no longer of any consequence."

Again, until perhaps a final interpretation is noticed and acted upon in a new implementation rule for $PM_{2.5}$, these are just opinions.

In any case, UDAQ anticipates that it will need to address the Serious Area planning requirements, and remains committed to finding solutions to Utah's air quality issues, even prior to any action concerning reclassification**.**

[1] On January 4, 2013, in *Natural Resources Defense Council (NRDC) v. EPA*, the D.C. Circuit Court remanded to the EPA the "Final Clean Air Fine Particle Implementation Rule" (April 25, 2007) (the "2007 $PM_{2.5}$ Implementation Rule") and the "Implementation of the New Source Review (NSR) Program for Particulate Matter Less than 2.5 Micrometers ($PM_{2.5}$)" final rule (May 16, 2008) (the "2008 $PM_{2.5}$ NSR Rule). The Court found that the EPA erred in implementing the 1997 $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) pursuant solely to the general implementation provisions of subpart 1 of Part D of Title I of the Clean Air Act (CAA or Act), without also considering the particulate matter-specific provisions of subpart 4 of Part D. The Court's ruling remanded the rules to the EPA to address implementation of the 1997 $PM_{2.5}$ NAAQS under subpart 4.

Comment G-2 (From EPA Enclosure I, 1-a): Under section 189(c) in subpart 4 of the Clean Air Act, the Reasonable Further Progress (RFP) requirements in section 172(c) are tied to quantitative milestones. These requirements should be applied to the Salt Lake City and Provo $PM_{2.5}$ SIPs, and the appropriate milestone date should be December 31, 2017.

RFP for these two SIPs is addressed in Chapter 8. Therein, the discussion notes that the emissions inventory for 2015 (the attainment year) reflects the implementation of all Reasonably Available Control Measures (RACM and RACT), up to and beyond the attainment date (implementation of some of these RACT measures is not required until 2016, 2017, 2018, or 2019). This information is adequate to show that, even if all these controls were implemented by 2015, the areas would still not show attainment.

However, the RFP plan, as depicted in Tables 8.1, should remove any measures with an implementation date that is subsequent to the attainment date in 2015 and represent the effectiveness of those controls in the interim years. These controls should correlate to the annual RFP for 2016 or 2017. Furthermore, to ensure linear progress in future RFP considerations, the plan should identify additional controls, and those controls should also be reflected in Tables 8.1.

DAQ Response: In general, this comment illustrates the need for clear guidance at the time SIPs are developed. As part of its action on January 4, 2013, the D.C. Circuit Court remanded to EPA the task of preparing a new implementation rule for the $PM_{2.5}$ NAAQS. As the deadline for submitting the Subpart 4 Moderate Area SIPs approaches, we are still left without even a proposal of the forthcoming rule. The "Deadlines Rule" prepared in the wake of the Court's ruling noted this, and pointed to the 1993 General Preamble as well as to various actions in the FR. The commenter takes issue with the interpretation of the requirements made by UDAQ and offers its own interpretation instead. Having read the comment, UDAQ is still unpersuaded.

For "plan revisions demonstrating attainment," UDAQ agrees that the RFP requirements in Section 172(c) are in fact tied to the quantitative milestones described in Section 189(c)(1) of Subpart 4. However, the two plans at the focus of the comment (SLC and Provo) do not demonstrate attainment. Instead, they demonstrate that attainment by the applicable attainment date is impracticable. This distinction is introduced in Section 189(a)(1)(B) of Subpart 4, where the plan provisions for moderate nonattainment areas are discussed.

Therein, it is explained that "each state in which all or part of a Moderate Area is located shall submit an implementation plan that includes" "either (i) a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment date; or (ii) a demonstration that attainment by such date is impracticable."

The latter, a demonstration that attainment by such date is impracticable, is very unique. Nowhere else in the CAA is this option permissible. The general SIP requirements of Section 172(c) call for plan provisions that "…shall provide for attainment of the national primary ambient air quality standards." Even under paragraph 189(b)(1)(A) in Subpart 4 "Additional Provisions for Particulate Matter Nonattainment Areas," plan provisions for areas reclassified as Serious require a demonstration of attainment, either by the applicable attainment date or by the most expeditious alternative date practicable.

Having drawn this distinction in Section 189(a), the Act then applies it to the milestones described in Section 189(c), and requires these milestones in "plan revisions demonstrating attainment."

The commenter is correct in stating that the RFP requirements are tied to the quantitative milestones described in Section 189(c), where, in fact, they apply.

RFP however, as described in Subpart 1 of Part D of the CAA "Nonattainment Areas in General," is a much more general requirement. Section 172(c) says simply that plan provisions submitted under Part D shall require reasonable further progress. RFP itself is defined in Section 171 as "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date."

As such, RFP is a required element for these two plans, but since they do not demonstrate attainment RFP takes the more general meaning described in Subpart 1.

The application of RFP, in the context of Moderate PM_{10} Area planning requirements, was addressed by EPA Region 9 in its proposal to promulgate a Federal Implementation Plan for the Arizona-Phoenix nonattainment area (FR Vol. 63, No. 62, April 1, 1998, pp. 15923). Noting that the planning requirements for PM_{10} nonattainment areas are set out in subparts 1 and 4 of (title I of) the CAA, and citing the "General Preamble" as describing EPA's preliminary views on how the Agency intends to review SIPs for moderate PM_{10} nonattainment areas, a listing was made of required plan elements. That list includes, in addition to other elements:

> "(d) For plan revisions demonstrating attainment, quantitative milestones which are to be achieved every 3 years and which demonstrate reasonable further progress (RFP), as defined in section 171(1), toward attainment by the applicable attainment date (CAA section 189(c));[6] and,"
>
> "(e) For plan revisions demonstrating impracticability, such annual incremental reductions in PM-10 emissions as are required by part D of the Act or may reasonably be required by the Administrator for the purpose of ensuring attainment of the PM-10 NAAQS by the applicable attainment date (CAA sections 172(c)(2) and 171(1))."

The footnote (6) referenced in paragraph (d) said the following: "As will be seen below, the proposed PM-10 FIP for the Maricopa area does not demonstrate attainment by the applicable attainment deadline, but rather includes the alternative demonstration that attainment by that date is impracticable. Therefore, section 189(c) does not apply and is not discussed further in this notice."

That same proposal (pp. 15927) states that "EPA has concluded that for PM-10 plans that demonstrate that it is impracticable for an area to attain the NAAQS by the applicable attainment date, the governing statutory requirement for RFP is section 172(c)(2) as defined by section 171(1)."

In the prior rulemaking and guidance for $PM_{2.5}$ (since remanded), RFP had been discussed in the context of Subpart 1 and was prescribed as generally linear progress between the base year of the plan and the applicable attainment date. Hence, as one tracks emissions in the area over time, the linear progress may be described, in geometric terms, by a line tracing (vertically) the reduction in emissions necessary to

show attainment and (horizontally) spanning the number of years between the attainment year and the base year.

Difficulties are encountered when trying to apply this definition of RFP to a Moderate Area SIP demonstrating the impracticability of attaining the applicable standard by the applicable attainment date. In geometric terms, the vertical trace of the line is unknown because the total reduction in emissions necessary to reach attainment has not been determined.

Such difficulties were described by EPA region 9 when the proposed FIP for the Phoenix nonattainment area was later promulgated (FR Vol. 63, No. 148, August 3, 1998, pp. 41326). In approving the RFP element, as proposed, EPA "interprets the RFP requirement for areas demonstrating impracticability as being met by a showing that the implementation of all RACM has resulted in incremental emission reductions below pre-implementation levels."

For the Salt Lake City and Provo SIPs, RFP is described in Section 8.3 of each SIP. The discussion therein identifies the afore mentioned difficulty in applying RFP in the traditional sense to a demonstration of impracticability. A table (8.1) is presented which illustrates instead the reduction in emission levels between the attainment year (2015) and the base year (2010). This is consistent with the interpretation given in the August 3, 1998 FR notice. Emission levels for 2017 are not shown because section 189(c) does not apply.

Footnote 1 in (each) Section 8.3 notes that the emission levels presented for 2015 in Table 8.1 reflect the inclusion of some RACT measures with implementation schedules beyond the attainment date. The commenter notes that this is acceptable for the purpose of the attainment demonstration element of the plan, but for the RFP element indicates that the emissions attributable to these measures should be removed from the 2015 totals. UDAQ agrees, and will make the necessary correction in both SIPs.

To the commenter's point that additional control measures should be identified and included in the plan, UDAQ anticipates that the Serious Area plans will require additional reductions in emissions and is already looking at what those reductions might be.

Comment G-3 (From EPA Enclosure I, 1-b): The draft SIPs' contingency provisions do not appear to satisfy applicable requirements.

First, as noted in the General Preamble, the measure should state that the measure will go into effect upon a determination by EPA that the area has failed to make RFP or attain the NAAQS by the statutory deadline. The SIP should state that the contingency measures will be triggered by an EPA determination that: 1) the area has, based on the state's milestone report under 189(c), failed to make RFP; or 2) has failed to attain the NAAQS by the applicable attainment date. Also, R307-302-3 should be revised to reflect that the measure applies once EPA has made one of these two determinations.

Second, the General Preamble notes that contingency measures "should be approximately equal to the emissions reductions necessary to demonstrate RFP for one year." The state should estimate the emission reductions that would be achieved by lowering the trigger level for no-burn periods to 15 µg/m3 and

assess whether those reductions would approximately equal the reductions necessary to demonstrate RFP for one year.

DAQ Response: Addressing each part in turn, First – UDAQ agrees that the SIP narrative can be augmented to explain the triggering mechanism for the contingency measure contained in R307-302-3. However, as explained above in responses to comments G-2 (in response to EPA Enclosure I, 1-a) above G-4 (in response to EPA Enclosure I, 1-c) below, Section 189(c) applies only to plan revisions demonstrating attainment.

Thus, the following language will be added to the SIP narrative in Section 9.2 within SIP Subsection IX.A.23, the $PM_{2.5}$ SIP for the Logan nonattainment area:

> This contingency measure will be triggered by an EPA determination that: 1) the area has, based on the state's milestone report under 189(c), failed to make RFP; or 2) has failed to attain the NAAQS by the applicable attainment date.

However, for SIP Subsections IX.A.21 and 22, $PM_{2.5}$ SIPs for the Salt Lake City and Provo nonattainment areas respectively, the SIP narratives will be supplemented as follows:

> This contingency measure will be triggered by an EPA determination that: 1) the area has failed to make RFP; or 2) has failed to attain the NAAQS by the applicable attainment date.

Concerning the rule itself, R307-302-3, the language can be modified as shown below:

(5) $PM_{2.5}$ Contingency Plan. If the EPA determines that a $PM_{2.5}$ nonattainment area has either 1) failed to make RFP as described (for each nonattainment area respectively) in SIP Subsection IX.A. 21, 22, or 23; or 2) has failed to attain the 2006 24-hour NAAQS by the applicable attainment date, the $PM_{2.5}$ contingency plan shall have been implemented within that nonattainment area, and [~~$PM_{2.5}$ contingency plan of the State Implementation Plan has been implemented,~~] the trigger level for no-burn periods as specified in R307-302-3(4) shall be 15 micrograms per cubic meter for the area where the $PM_{2.5}$ contingency plan has been implemented.

UDAQ will commit to making this rule revision at its earliest opportunity. It will be done well before the earliest of these events could possibly occur.

Second – Regarding the anticipated emissions reduction associated with a lowering of the trigger level, UDAQ will make the assessment and include it within the Technical Support Document.

Comment G-4 (From EPA Enclosure I, 1-c): Section 189(c) of subpart 4, "Milestones", is presented and reads as follows: *"Plan revisions demonstrating attainment submitted to the Administrator for approval under this subpart shall contain quantitative milestones which are to be achieved every 3 years until the area is redesignated attainment and which demonstrate reasonable further progress, as defined in section 171(1), toward attainment by the applicable date.*"

EPA Region 8 notes that the SIP narratives for Salt Lake City and Provo state that this requirement does not apply because those plans "do not demonstrate attainment", and that this interpretation effectively

inserts the words "by the applicable attainment date" into section 189(c)(1). The comment then says that "Section 189(c)(1) does not specify that it only applies to plans that demonstrate attainment by the applicable attainment date. Instead, the commenter points to the General Preamble (57 FR 13488, 13598; April16, 1992) as "discussing the equivalent requirements for all Moderate area PM_{10} plans, regardless of whether the plans fall under 189(a)(1)(B)(i) or 189(a)(1)(B)(ii)." The passage from the General Preamble is presented and reads as follows: "*RFP/quantitative milestones. The PM-10 nonattainment area SIPs must include quantitative emissions reductions milestones which are to be achieved every 3 years and which demonstrate RFP, as defined in section 171(1), until the area is redesignated attainment [section 189(c)].*," though the reference to section 189(c) in the Preamble was omitted from the comment. This portion of the comment then concludes with the statement that "While the General Preamble is not binding, it reflects EPA's intended interpretation of 189(c)(1)."

Having asserted that Section 189(c)(1) does apply in the cases of these two SIPs submitted under section 189(a)(1)(B)(ii), the comment then points again to the General Preamble in order to assign a starting-point for the counting of the 3-year increments. The Preamble states that it is reasonable to begin counting from the due-date for the applicable SIP; in this case December 31, 2014. Thus, December 31, 2017 is presented as the due-date for the next quantitative milestone, and again Region 8 asserts that the SIPs for these two areas should set quantitative milestones for December 31, 2017 that reflect RFP (i.e. annual incremental reductions out to the milestone date of December 31, 2017).

The comment concludes by noting that the SIPs for Salt Lake City and Provo should include motor vehicle emission budgets (MVEB) for the year 2017.

DAQ Response: UDAQ would again point to the need for a specific interpretation of this issue in the forthcoming implementation rule. Absent that guidance, UDAQ is left to look at the Clean Air Act alongside the "General Preamble" and note the difference.

The passage in the Preamble only paraphrases the Act, and in doing so omits a key phrase. The substitution of "*The PM-10 nonattainment area SIPs*" for "*Plan revisions demonstrating attainment*" is likely a careless error. Given that the Preamble includes a direct reference to Section 189(c), UDAQ is inclined to believe that EPA intended only to reiterate the requirements of that paragraph in the Preamble. If however, as the commenter asserts, it reflects EPA's intended interpretation of 189(c)(1), EPA most certainly should have included a discussion of the issue and explained why that key phrase should not be interpreted to exclude plan revisions submitted in accordance with Section 189(a)(1)(B)(ii). UDAQ might add that nowhere in the Preamble does it say that "all Moderate area PM_{10} plans" must contain quantitative milestones. In any case, the plain language of the Clean Air Act should carry more weight than a guidance document.

UDAQ takes no issue with the commenter's interpretation of how a milestone described in Section 189(c) should be counted, but would again point out that Section 189(c) does not apply in these instances. See also Response to Comment G-2 (in response to EPA Enclosure I, 1-a).

Similarly, the inclusion of a motor vehicle emissions budget does not apply to either of these SIPs either. See also Response to Comment T-6 (in response to EPA Enclosure IV, 2-b).

Comment G-5 (From EPA Enclosure I, 1-d): Nonattainment New Source Review, Banked Emission Credits. With regard to Chapter 6 in all three SIPs, "New Source Review/Banked Emission Reduction Credits," rule R307-403-8, banking of emission reduction credits (ERCs) continues to have problematic language. While the State has retired credits accumulated before December 31, 2013 for the purpose of offsetting increases in PM2.5 and PM2.5 precursor emissions, the State intends to bank credits after that date for this purpose. Under 40 CFR 51.165(a)(3)(ii)(C), the nonattainment NSR program must ensure that offsets are surplus, permanent, quantifiable, and federally enforceable. So that the nonattainment NSR program can meet these requirements, the State should address the issues identified in the May 10, 2001 letter from Richard R. Long, Director, Air and Radiation Program, EPA Region 8, to Rick Sprott, Director, UDAQ. EPA stated in that letter, "We do not consider [R307-403-8] to be sufficient to ensure that banked emission reductions meet all requirements to be creditable." We also note that, as Moderate area plan requirements now apply within the nonattainment areas, in order to be surplus and usable during the period of classification as Moderate, banked credits should exceed (in addition to any other applicable requirements) RACT/RACM requirements. UDAQ should be aware that the usability of any credits banked during the period of Moderate classification should be revisited if and when an area is reclassified to Serious or any other CAA requirements become applicable.

DAQ Response: The provisions of EPA's permitting rule for nonattainment areas, 40 CFR part 51, Appendix S are applicable in Utah under the both the federally approved new source review (NSR) rules in Utah's SIP, and the $PM_{2.5}$ implementation rule for NSR. EPA's own rules contain adequate provisions to address EPA's concerns.

Utah's federally-approved rules reference Appendix S. Utah's Nonattainment Area New Source Review (NAA NSR) rule, R307-403, was fully approved by EPA on May 5, 1995. R307-403-8 *Offsets: Banking of Emission Offset Credit*, states, "Banking of emission offset credit will be permitted to the fullest extent allowed by applicable Federal Law as identified in [among other provisions] 40 CFR 51, Appendix S."

Appendix S also applies in Utah under the $PM_{2.5}$ implementation rule for NSR. On May 16, 2008, EPA finalized regulations to implement the New Source Review Program for fine particulate. The transition provisions in the regulations state, "According to the provisions of 40 CFR 52.24(k), during such an interim period when a State lacks an approved NA NSR program for a particular pollutant, appendix S of 40 CFR part 51 applies for NA NSR permitting" (73 FR 28342). Utah's rules did not contain all of the required provisions, so Appendix S applies in Utah during the interim period until EPA approves revisions to Utah's rules to implement the requirements for $PM_{2.5}$. On May 1, 2013, the Air Quality Board adopted revisions to R307-403 to incorporate the new provisions for $PM_{2.5}$ and these revisions were submitted to EPA on August 20, 2013. A minor revision to these rules to clarify the significance level for VOC was adopted on December 4, 2013, and was submitted to EPA on March 24, 2014. EPA has not yet acted upon these submittals. Because both the $PM_{2.5}$ implementation rule for NSR and the approved banking provisions in R307-403-8 refer back to the federal requirements in 40 CFR 51, Appendix S, EPA's concerns are already addressed.

When the proposed SIPs are adopted, all RACT measures in Part H will become enforceable under State law. Under both Utah's rules and Appendix S, emission reductions to meet established RACT

requirements are not surplus and will not be eligible for banking or for use as an emission reduction credit.

DAQ has already committed to work with EPA through a separate process to address the issues raised in the May 10, 2001 letter from Richard R. Long, Director, Air and Radiation Program, EPA Region 8, to Rick Sprott, Director, DAQ. Many of the issues that were raised in 2001 have been resolved, and DAQ welcomes the opportunity to work with EPA to determine what additional issues remain. The federal requirements have changed since EPA's letter was drafted in 2001. On November 29, 2005, EPA revised its nonattainment area permitting rules to incorporate the 1990 Clean Air Act Amendments – in 2001 EPA was still relying on the 1992 General Preamble as guidance. There have been numerous other changes to the NSR requirements since 2005. In addition, as mentioned above, Utah's rule R307-403 was revised in 2013 to address many of EPA's concerns and EPA has not yet acted upon that submittal. A significant effort will be required, including staff from both DAQ and EPA, to identify and resolve any remaining issues. DAQ has delayed this effort, at the request of EPA, until after EPA has taken action on a backlog of SIP submittals from Utah and other states that are a priority for the Region. The language regarding Banked Emission Reduction Credits in Chapter 6 of each of the $PM_{2.5}$ SIPs was sent to EPA in March, 2014 for review. If EPA's concerns had been communicated earlier in the process, we could have accelerated the process to identify and resolve any remaining issues from the 2001 letter. EPA will need to commit resources to this process to ensure success.

Comment G-6 (From EPA Enclosure I, 1-e): In order to provide a complete RACT/RACM analysis, UDAQ should provide a review of other state's ammonia control rules that have already been implemented in the document within the TSD titled 'Area Source Ammonia Reasonably Available Control Technology (RACT).'

DAQ Response: We have amended the document in the TSD (5.b.ii) to include an analysis on other states' ammonia control rules. We have also added graphics and ammonia emissions for poultry and cattle CAFOs.

Comment G-7 (From the Wasatch Clean Air Coalition (WCAC)): There are some questions that deserve continued public consideration, especially in light of the likelihood of another [SIP] iteration for serious nonattainment under Subpart 4.

a. One such question surrounds decisions concerning [motor vehicle] fleets. Some examples are the ground fleet at the SLC airport, FrontRunner, school and transit buses, cabs, rental cars and fleets at larger industrial sites. The public needs explicit cost per ton information on potential emission reductions within these fleets.
b. Another question is how can we ensure vehicles driven to and parked regularly at large lots in nonattainment areas have emission inspections?
c. Another question is how to get Tier 3 fuel into Utah gas tanks.

Another question is how to identify and require lower emission operations by commercial and industrial sources during our inversions.

DAQ Response: UDAQ agrees with WCAC, and supports an assessment of possible emission reduction strategies. As the control strategies for the next round of SIPs are developed, these are ideas that are worth pursuing even if the SIP credits are only voluntary.

Emission Inventories Comment

Comment EI-1 (From EPA Enclosure V,1): EPA states in Enclosure 5 of EPA Region 8 Comments on Utah's Proposed State Implementation Plans and Technical Support Documents that: "A triennial emission inventory encompassing the Salt Lake, Provo and Logan nonattainment areas has been developed by the state for the year 2011. Utah should compare the emissions released during 2011 within the nonattainment areas with their projection of emissions for the attainment demonstration. This comparison would provide some indication of any bias introduced into the data from the projections. Corrections in the projections could be made based on actual emissions for 2011. A 2014 triennial inventory is currently being developed by the state. Depending on the timing of its completion, it also could be used to assess the State projections for future years."

DAQ Response: According to EPA's request, UDAQ compared emissions projected forward to 2011 to actual 2011 emissions.

This analysis indicated that the emissions projected forward to 2011 were 10% greater than the actual 2011 emissions. However, since the modeling baseline year is 2010, UDAQ believes that it is more appropriate to compare the projected to actual emissions for the 2010 calendar year. In order to perform this analysis UDAQ needed to first compile the actual 2010 emissions. However, since 2010 is not a triennial inventory year some adaptation of the dataset was necessary. Since only the large major sources were required to submit emissions inventories in 2010, UDAQ compiled the overall 2010 emissions by combining the actual 2010 emissions from the large major sources with the actual 2011 emissions from the remaining sources. The emissions projected forward to 2010, which were used in the SIP modeling, were then compared to the overall actual 2010 emissions. This analysis indicated that the emissions projected forward to 2010 were only 3.5% greater than the overall actual 2010 emissions.

UDAQ believes that a 3.5% difference between projected and actual 2010 point source emissions is negligible due to uncertainties in the model inputs, including the emissions inventory. For this reason UDAQ believes that no discernable bias is being introduced into the data.

Emission Standards Comments

EPA Comments (Comments ES-1 through ES-13)

In Enclosure II of EPA's submitted comments, EPA submitted several comments on Utah $PM_{2.5}$ SIP subsections IX.H.11, 12, and 13, RACT Discussion in SIP Narratives and RACT Technical Support Documents. In addressing EPA's comments, UDAQ has condensed several of them as they were applied similarly in several places. UDAQ will therefore respond to these multiple comments only once.

Comment ES-1: The Reasonably Available Control Technology (RACT) limits, in some cases, need revisions to make the limits practically enforceable, to include monitoring, recordkeeping, and reporting requirements, and to align the limit's averaging period to be appropriate to the 24-hour $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS). There are also some problematic startup and shutdown exemptions included in the RACT limits.

DAQ Response: The UDAQ disagrees with the concept that all requirements a source will be subject to should be listed in the SIP. It has been UDAQ's intention from the outset to make the limits and limitations of the SIP practically enforceable. Utah has a federally approved State Implementation Program. The Utah air permitting program is an element of the federally approved SIP. The UDAQ believes that enforceability particularly related to the monitoring, recordkeeping and reporting, has been accomplished and will continue to be accomplished through Approval Orders issued in accordance with the EPA approved permitting program. In addition to Approval Order monitoring requirements, SIP subsection IX.H.11 contains general monitoring requirements that are applicable to all SIP sources.

Regarding the aligning of the averaging period of various limits to the 24-hour $PM_{2.5}$ NAAQS, UDAQ believes that in many cases this imposes an undue testing or monitoring burden on a source which is not needed. Further, since no specific controls or even control methodology has been implemented for the reduction of certain emissions, imposing frequent monitoring, recordkeeping and reporting requirements does not result in an expedited decrease in emissions or an expedited attainment date. UDAQ does acknowledge that some sources may have somewhat extended testing and/or monitoring requirements, but has generally imposed an alternate mechanism for achieving overall attainment with the NAAQS (such as 24-hr SIP Caps).

In regards to startup and shutdown exemptions, UDAQ acknowledges this comment. Although UDAQ has addressed startup and shutdown events and has attempted to eliminate all exemptions to emission limits or to supply alternatives during these periods, UDAQ agrees that some disagreement remains. However, UDAQ believes that this issue is best resolved during development of a serious nonattainment area SIP, rather than attempting to further address the issue at this time. No additional control method or control equipment is being installed or implemented during startup or shutdown events. Sources are already required to pursue best operating practices to minimize air emissions during periods of startup or shutdown; and seeking to impose additional limitations, with the associated monitoring, recordkeeping and reporting requirements, will not further expedite attainment or result in lower emissions.

Comment ES-2: The RACT limits must be in the SIPs and not just referenced in Approval Orders.

DAQ Response: UDAQ disagrees with this comment. DAQ notes that the CAA lists the requirements for nonattainment plan provisions at 172(c.) Among those requirements are: 1. the implementation of all reasonably available control measures, 2. the inclusion of enforceable emission limitations, … schedules and timetables for compliance, **as may be necessary or appropriate** to provide for attainment [emphasis added], and 3. the issuance of permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area.

DAQ recognizes the importance of identifying and ensuring the implementation of RACM / RACT and also the importance including enforceable emission limitations in the plan. We also recognize the overlap between the two requirements, but would point out that they are in fact separate.

Each of these nonattainment areas is a complex urbanized area, and includes sources ranging from small to those large-enough so as to have been identified in these $PM_{2.5}$ SIPs as warranting specific attention for purposes of ensuring RACM / RACT. Many of these larger sources include a litany of source components that also range from small to large. Many of these smaller source components are no different from those owned and operated by smaller sources. While it remains important to ensure that the operation of these components is in keeping with RACM / RACT, attainment or nonattainment of the NAAQS does not hinge on the emissions from such source components.

By contrast, there are other more significant source components that do, by themselves, have the potential to directly influence air quality. For source components such as these, it "may be necessary or appropriate" to include in the SIP an enforceable emission limitation or control measure. In essence, it is not necessary or appropriate to include, in the SIP, an enforceable emission limitation for every insignificant piece of equipment simply because it passed a RACT evaluation. Clearly, some discretion is necessary in determining how to distinguish these from the source contributions that do belong in the SIP.

Given this important distinction, DAQ would point to its NSR permitting program and the role of that program as a required element (from 172(c)(5)) of these plan provisions. This program has been approved by EPA into the Utah SIP. The approval orders issued as a consequence of this program offer a repository for the many emission limitations that would not rise to the level of importance compelled by the SIP. The DAQ also administers a minor source permitting program, and a BACT analysis is required for minor sources and for major sources that are below significance. Collectively, these limits and the NSR rules and regulations that prescribe them, are part of a control strategy that is adequate for timely attainment of the $PM_{2.5}$ NAAQS.

Hence, SIP Sections IX. Part H.11, 12, and 13 do not contain emission limitations for every individual control element described in the RACT Evaluation Reports. Each listed source is also subject to approval orders which contain multiple federally enforceable limits. It is UDAQ's intention that these limits remain in place as well as continue to improve as new AOs are developed and imposed. However, as the SIP is developed, UDAQ will include only those limitations that are necessary and appropriate to provide for attainment.

As a point of reference, the PM_{10} SIP included all permit requirements for all SIP listed sources. This approach has resulted in numerous problems that in some cases have resulted in the inability of UDAQ to issue Title V Permits. The UDAQ intends to put limits in the SIP that provide for reductions that lead to attainment of the standard; but the UDAQ will not put requirements in the SIP that prevent the source from using the permitting process to improve efficiency or to modernize processes. The UDAQ will also not put requirements in the SIP that become antiquated as new federal limits are implemented, or as new monitoring methods become available.

Comment ES-3: IX.H.11.g.vi: The EPA will continue to collaborate with Utah on addressing moderate area plan requirements for refineries that intend to produce Tier 3 gasoline

UDAQ Response: No response is required.

Comment ES-4: In our [EPA's] December 2, 2013 comment letter we made several general comments and a number of facility specific comments in reference to projected versus allowable emissions, and averages and frequency of monitoring, and how these items are used in modeling to support the SIP and meeting attainment requirements.

In general, we suggest that the UDAQ consolidate and/or clarify and provide more detail as applicable in SIP sections and/or RACT evaluations that explain these rationales and requirements.

DAQ Response: Concerning the use of projected actual emissions in the modeling demonstration, DAQ explained the validity of its approach in response to EPA's December 2, 2013 comments. Firstly, DAQ's approach is in accordance with EPAs guidance.

From a technical standpoint, DAQ relied upon "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze" (EPA – 454/B-07-002, April 2007).

DAQ believes the guidance makes this particular recommendation because of the chemical reactivity of both $PM_{2.5}$ and ozone. In both cases, the chemistry is non-linear, and model predictions regarding concentrations of these pollutants are functions of the chemical equilibrium present at any given time in the airshed. Overly conservative projections of emissions can misrepresent this equilibrium and lead to erroneous model results. DAQ was mindful of making reasonable projections in the future-year emissions, and did not use an overly conservative representation of permissible emissions from stationary sources. The modeling analysis also accounts for permitting actions that transpired between the 2010 baseline and now. This accounting is consistent with the notion of a reasonable projection.

More specifically, EPA addresses how emissions should be estimated for future years (see Section 17.6), and notes: "The goal of making projections is to obtain a reasonable estimate of future-year emissions that account for the key variables that will affect future emissions." Concerning growth as one of those variables: "A representative growth rate should be identified from the available data sources and all information known about the sources and sectors. Stakeholder review of the data can be helpful during

this step; for example, an industrial facility with large projected emissions may be able to review the data and provide additional information for a more informed future-year estimate."

The alternate approach would have been to model each of the identified point sources at its maximum allowable emission rate. This however leads to the projection of a worst-case scenario. It would assume that every one of these sources was emitting at its maximum allowable rate, all at the same time. Furthermore, this bias is made more extreme when one considers an averaging time that is less than an annual average. 24-hour emission rates (consistent with a 24-hr. $PM_{2.5}$ standard) naturally show more fluctuation than an annual rate; a fact that is accounted for in the establishment of emission limits.

A worst-case scenario may be satisfying from a legal standpoint, but would not represent a reasonable estimate of future emissions. Instead, it is more reasonable to look at the collection of these sources in aggregate. It is much more realistic to assume that while one or more sources are operating at rates higher than average, other sources are operating at lower rates. This is the law of averages.

DAQ has, in the past, relied on allowable emissions for SIP attainment demonstrations. Of particular note would be the 1991 SIP for PM_{10}. We note however, that this was done within the scope of an inventory based approach, used in conjunction with a receptor model that was not able to replicate the complex non-linear chemistry at work in these airsheds. Underlying that SIP was a 1 to 1 conversion rate from precursor to particle. Clearly this is not the case.

These draft SIPs are based on photochemical modeling that includes the ability to reconcile non-linear chemistry, and makes evaluations concerning $PM_{2.5}$ concentrations, in a relative sense. EPA's Modeling Guidance discusses the modeling of future concentrations in a relative sense and concludes: "Because the test is relative, in most cases, actual emissions should be used. The actual emissions should be representative of emissions on high $PM_{2.5}$ days (days that exceed the NAAQS). Since the absolute predicted concentrations are not used directly, allowable emissions may overestimate the changes in concentrations due to the identified sources." This is contrasted with modeling in other (non-SIP) applications: "Modeling with allowable emissions is sometimes warranted. For example, for permit modeling, we generally compare the absolute predicted modeled concentrations against the NAAQS or the PSD increment. Therefore, in the case of permit modeling, it is sometimes appropriate to model with allowable emissions."

Furthermore, in addressing the creation of future-year inventories and air quality model inputs, EPA notes: "Every attempt should be made to use consistent approaches between the future year and the base year for all of these modeling steps. Inconsistencies in approaches between the future-year modeling and the base-year modeling can lead to artificial differences in air quality modeling results that can affect conclusions. Therefore, it is critical to avoid such differences whenever possible." DAQ notes that the base-year inventories were constructed using actual emissions from 2008 (projected forward to the year 2010. Also, sources not present in the 2008 inventory were added into the projection-year inventories at 90% of their allowable emissions).

In its comment, EPA points us to the 1992 General Preamble which says: "When developing a control strategy and demonstrating attainment with *dispersion modeling*, the State *may* determine that some actual emissions must be reduced and also some allowable emissions must be reduced to the levels that the sources are actually emitting". (57 FR, 13498, April 16, 1992) This language does not definitively

indicate that states are required to base their attainment demonstrations on allowable emissions, rather, the language EPA provides is suggestive and somewhat discretionary. DAQ would note that air quality modeling has advanced a long way since 1992, and that the Modeling Guidance prepared in 2007 represents a more technically sound basis for assessing future-year emissions in a photochemical model.

Finally, DAQ would point out that Utah is not the only state to have based its SIP on projected allowable emissions. EPA approved SIPs for the San Joaquin Valley and the South Coast regions that estimated point source emissions using projected growth rather than allowable emissions. In taking action, EPA noted that: "These methodologies for projecting future emissions based on growth factors and existing Federal, State, and local controls were consistent with EPA guidance on developing projected baseline inventories… [W]e conclude that the projected baseline inventories for 2009, 2012, and 2014 were prepared consistent with EPA's guidance on development of emissions inventories and attainment demonstrations and, therefore, provide an adequate basis for the RACM, RFP, and attainment demonstrations in the Plan." (at 76 FR 69907-08)

Since the approach taken in the SIP modeling is consistent with the EPA's guidance, UDAQ sees no reason to reiterate the underlying reasoning in the SIP narrative.

Comment ES-5: Condensable particulate matter should be taken into account in determining emission inventories and in setting RACT limits. As mentioned above, the emission limit should at least be estimated and the estimating procedure provided in the SIP.

DAQ Response: UDAQ disagrees with this comment. In cases where a condensable particulate limit has been 'deferred' or language is present which requires the source to conduct testing to establish the ratio between condensable and filterable $PM_{2.5}$, it is UDAQ's measured opinion that it would be unwise to establish limits on the condensable fraction of $PM_{2.5}$ emissions without adequate testing data, especially as it pertains to setting the condensable/filterable ratio on new and previously unseen equipment and processes.

To date, these sources have not conducted stack testing or done so with sufficient frequency to develop an adequate condensable particulate matter speciation in order to appropriately set a limit.

Any attempt to set a limit based upon estimation, as suggested, is subject to several problems. For a set value to have any validity as a limit, then it must be enforceable as a practical matter, and be subject to compliance action. Therefore, basing the "estimated" limit off an invalid or incorrect assumption or erroneous data would subject the source to penalties and other compliance action, through no fault of their own. If the limit is so loosely interpreted that the source is not subject to such action, then it can easily be argued that the "limit" is not serving as a limit, and indeed serves no useful purpose. UDAQ believes that it is better to require that these sources collect condensable particulate matter emissions data and then establish a full $PM_{2.5}$ emission limitation by a specific date once that data has been collected, as we've outlined in our submitted SIP.

Comment ES-6: Please explain why stack test frequencies are sufficient to ensure continuous compliance with the limits.

UDAQ Response: Stack testing frequency is based on engineering judgment and the permit writer's knowledge regarding the specific sources process and history. How close a source is to a threshold (significance, PSD, etc.), what existing stack requirements are in place, and whether the equipment is controlled with industry wide accepted technology are some things considered when setting testing frequency. UDAQ has a long history of data collection, both with the specific source and with other similar sources. This data shows a lack of variability in emissions information.

Furthermore, stack testing alone is generally not enough to verify compliance. Facility compliance with emissions limits also depends on the verification of operating parameters, such as feed rates etc. These parameters are verified on an on-going basis. Periodic stack tests help to insure these parameters are accurate and effective in controlling emissions to within the limits specified.

Comment ES-7: Please explain how annual (or less frequent) reporting of excess emissions is adequate for enforcement of short-term emission limitations intended for attainment of a 24-hour standard. In addition, sources that are subject to only R307-150-7 are not specifically required to report either excess emissions or emissions of direct $PM_{2.5}$

DAQ Response: UDAQ did not base its attainment demonstration on the inclusion or expectation of excess emissions. While some level of excess emissions might be expected from industrial sources based on past performance, it is not UDAQ's policy to base permitting or attainment demonstrations upon the assumption of failure – and then to make a further assumption as to the severity of that failure. Instead, excess emissions resulting from breakdowns are handled through UDAQ's existing breakdown rules.

While it is true that a source only subject to R307-150-7 is not specifically required to report excess emissions or emissions of direct $PM_{2.5}$, this is not the case for any SIP listed source. All sources listed in either H.12 or H.13 of the SIP are subject to R307-150-6, and not 150-7 as was suggested by the commenter. This rule requires the submission of an inventory that includes both direct emissions of $PM_{2.5}$ and excess emissions [see R307-150-6(1)(a) and (b)]. While these emissions may be reported only annually, such emissions must be calculated on a far more frequent basis to be effectively and properly recorded. UDAQ requires that emissions be calculated on a rolling 12-month basis. For any emission inventory to be properly maintained, excess emissions and direct emissions of $PM_{2.5}$ would need to be recorded on a minimum of at least a monthly basis.

Comment ES-8: IX.H.11.g.v.A: While we support the requirement for the refineries to comply with Subpart Ja, we note that Subpart Ja contains an exemption from the H_2S limit in 40 CFR 60.103a(h) for

releases to the flare as a result of relief valve leakage or other emergency malfunctions. As we have noted above, this is inconsistent with CAA requirements that the SIP emission limits apply at all times, including periods of startup, shutdown and malfunction (SSM).

UDAQ Response: UDAQ does not believe that referencing the flaring requirements of Subpart Ja constitutes an exemption from a SIP limitation. Rather, UDAQ states that this specific limitation, "requiring the refineries to comply with subpart Ja," is the SIP limitation in question, and not the individual sub-limitation found within that subpart. Specifically, if the language of IX.H.11.g.v.A had not been added to the SIP in January of 2014, some of the refineries in the Salt Lake City $PM_{2.5}$ nonattainment area would not yet be fully subject to the requirements of NSPS Subpart Ja, and would not be required to comply with the fuel gas H_2S content requirement at all. UDAQ has added the SIP requirement of being subject to the subpart – whether the subpart would normally apply or not. The UDAQ did not specifically add the requirement of the fuel gas limitation.

Comment ES-9: Some RACT determinations, including wastewater treatment emissions control at refineries and numerous start-up/shutdown provisions need more support.

UDAQ Response: During the RACT review work for the initial version of the $PM_{2.5}$ SIP (issued in January 2014), UDAQ looked at the possibility of VOC control for wastewater treatment at the refineries based solely upon a general comment from its contractor. However, this "determination" was not delivered with any particular recommendations beyond this general comment. As the commenter has pointed out, one refinery does implement more involved VOC recovery/control than is utilized at the other refineries; but at this time UDAQ does not have the data available to adequately judge the amount of VOC reductions obtainable from the implementation of VOC controls. Consequently, no credit was taken for any VOC reductions at any of the refineries for this type of control method. This was explained in the RACT evaluation reports for the refineries.

Startup and shutdown provisions were based upon information received from the individual sources. Where possible, such provisions have also been extracted from existing permits (AOs) issued to those sources, and have been in use for some time.

The DAQ will review this issue again during the BACT process associated with the development of the serious area $PM_{2.5}$ SIP to assure sufficient documentation and support are provided.

Comment ES-10: Applicable MACT and NSPS standards must be listed in the SIP.

UDAQ Response: UDAQ disagrees with this comment. The applicable MACT and NSPS standards will still be applicable to the listed sources regardless of whether the individual listing is maintained in the SIP. The inclusion of such a listing serves only as a snapshot of applicability determination. As a non-dynamic listing, should circumstances change which render this applicability determination invalid, its inclusion serves no additional useful purpose and may even lead to future confusion as MACT and NSPS standards are revised and changed.

Comment ES-11: Page 5 of the Wasatch Integrated Waste Management RACT Evaluation Report indicates that RACT for $PM_{2.5}$, VOC and NOx includes replacement of the emergency diesel generator with a Tier 4 generator upon equipment replacement, but says there is no timeline established for this replacement at this time. Please explain why the state considers this to be RACT when there is no implementation timeline. The inability of the owner/operator to commit to an implementation date is not a basis for deferring CAA requirements.

DAQ Response: The $PM_{2.5}$ SIP demonstration for Wasatch Integrated Waste Management District evaluated the replacement of the current emergency diesel generator with a Tier 4 engine. It was concluded that the replacement was not required due to the excessive cost of $92,800 per ton of NOx removed. Additionally, the $PM_{2.5}$ SIP modeling demonstration did not include emission reductions for this generator replacement. Therefore, an installation date for a new tier 4 engine is unwarranted.

Comment ES-12: During the winter months, the draft SIP proposes to allow Unit #4 to burn coal during natural gas curtailments, and for a sufficient time to empty the coal bins following the curtailment. The DAQ should estimate this winter time usage (i.e. when natural gas will not be available), including the additional usage to empty the coal bins, via historical usage or some other applicable method. The resulting estimated emissions should then be used in the RACT analysis to determine control system viability, and the emissions included in the modeling if of a magnitude to be warranted.

DAQ Response: The UDAQ reviewed winter time usage of coal and does not believe there is sufficient data to estimate emissions as it is impossible to estimate the frequency and length of curtailments. As this is such a rare event, estimating such emissions to incorporate into the attainment demonstration would be overly conservative. As such, the inclusion of winter time emissions from curtailment of natural gas adds no value and UDAQ believes it inappropriate to include for attainment modeling.

Comment ES-13: The BYU RACT evaluation section 1.1 incorrectly states "Nucor Steel Facility Identification.

DAQ Response: Thank you for the comment. The title in this report will be corrected.

Comments from Wasatch Clean Air Coalition (WCAC) (Comments ES-14 through ES-17)

Comment ES-14:

> **IX.H.11.g.i.B.III - page 3 of 56, line 9-13**: By no later than Jan 1, 2019, each owner or operator of an FCCU shall install, operate & maintain a CPMS to measure & record operating parameters for determination of source-wide PM2.5 emissions as appropriate.

The position of 'as appropriate' is ambiguous. Is CPMS required if appropriate, or is appropriate CPMS required. The intention would be more clear to me if 'appropriate' were inserted before CPMS, 'an appropriate CPMS to measure...'

DAQ Response: The position of the words "as appropriate" is intentional. They are derived from NSPS Subpart Ja. Specifically:

60.105a(b) Control device operating parameters.

Each owner or operator of a FCCU or FCU subject to the PM per coke burn-off emissions limit in § 60.102a(b)(1) that uses a control device other than fabric filter or cyclone shall comply with the requirements in paragraphs (b)(1) and (2) of this section.

and

60.105a(b)(1)

The owner or operator shall install, operate and maintain continuous parameter monitor systems (CPMS) to measure and record operating parameters for each control device according to the applicable requirements in paragraphs (b)(1)(i) through (v) of this section.

Therefore, a CPMS is only required for those sources which are using a control device other than a fabric filter or cyclone for control of PM emissions. This requirement was specifically added based on comments received during the previous PM2.5 SIP submittal to address this shortcoming with NSPS Subpart Ja.

Comment ES-15: Now that the new MOVES model is available, the SIP would be improved by a brief discussion on the benefits of Tier 3 fuel on emissions, particularly mentioning the fact that EPA and DEQ analysis reveals that the use of this fuel is the best single strategy available.

DAQ Response: UDAQ agrees that this analysis would be interesting and perhaps useful in the interest of a public dialogue. However, Tier 3 was not included in the modeling for these SIPs, and could not even be introduced into these airsheds until after 2015, the attainment and analysis year for the SIPs. As work continues toward the Serious Area $PM_{2.5}$ planning requirements, Tier 3 will have implications that are within the pertinent time horizons. Also, users will likely be more comfortable with the results coming from MOVES 2014 at that time.

Comment ES-16: IX.H.12.a.i & ii - page 6 of 56, lines 7 & 16;

Please provide an analysis of 25 ug/m3 trigger for modified operations. Citizens want equity in air quality rules. If we cannot burn when a no burn period is called at 25 ug/m3, industry that is regulated by monitor levels should take action at the same level.

DAQ Response: R307-302 was developed to control emission from residential homes. The Approval Order and Title V permits written under the R307-400 rules were developed to control emissions from industrial sources. When a no burn period is declared, a residential home owner has the option of using natural gas to heat their homes. ATK may not have an option to switch fuel types when they are required to stop open burning, as is required in Section H.12.a.i and a.ii.

ATK is the only industrial source that has an operational restriction that is based on the $PM_{2.5}$ levels. The RACT process does not provide for curtailment of operations as a SIP limit. ATK volunteered to accept this restriction to help control the $PM_{2.5}$ levels during the Wasatch front inversion seasons. No change will be made to this SIP condition.

Comment ES-17: IX.H.12.o - Nucor

Please provide analysis the benefits of requiring NUCOR purchase vehicles of the lowest possible emissions when it replaces its onsite vehicles. On site vehicle fleets should enter into RACT analysis.

DAQ Response: When the $PM_{2.5}$ SIP was developed, all sources of emissions were taken into consideration. This included both minor (under 100 tpy) and major sources (over 100 tpy). The emissions from minor sources (area sources) are controlled by rules set to control the source type. These rules are listed in the UAC R307-300 series, Requirements for Specific Locations. It was determined that to include all of the minor sources into the SIP would not be effective when considering the time required and the required deadlines. This was because of the small or insignificant emissions from each individual source. When the requirements were developed for the major sources, a cutoff threshold was set that required DAQ to set limits at the most significant sources at each major source. The on-site vehicles at Nucor Steel are well below the cutoff threshold because there are very few vehicles at the Nucor site that are considered on-site vehicles.

Comments from Pacific States Cast Iron Pipe Company (Comments ES-18 through ES-20)

Comment ES-18: Subsection IX.H.13.d(iii). The version of the PM2.5 SIP available on UDAQ's website currently states:

iii. Emissions from the Annealing Oven furnace shall be routed through the operating baghouse prior to be emitted into the atmosphere.

In addition to fact that this condition was added to subsection IX.H.13 after the Air Quality Board's vote, the RACT analysis contained in the Technical Support Document determines that a baghouse for this source is infeasible. In discussing this issue with UDAQ personnel on October 9, UDAQ reported that the condition identified an incorrect unit at PSCIPCO's facility. UDAQ intended to require the Desulfurizaton and Ductile System at PSCIPCO's facility be routed through an existing baghouse as opposed to apply the baghouse requirement to the Annealing Oven. Consequently, PSCIPCO requests that subsection IX.H.13.d(iii) be revised as follows:

iii. Emissions from the desulfurization and ductile treatment system shall be routed through the operating baghouse prior to being emitted into the atmosphere.

UDAQ Response: UDAQ agrees with this comment. There was a typographical error made in the earlier language which inadvertently assigned the baghouse to the annealing oven furnace. The language of subsection IX.H.13.d(iii) will be changed as suggested by the commenter.

Comment ES-19: Current List of Changes to Part H. In the introduction to the Part H emission limitations proposed as part of the PM2.5 SIP, UDAQ included a description of the changes that were being applied to sources subject to the source-specific emission limitations. In this section, UDAQ states that PSCIPCO is subject to 40 CFR 63, subpart EEEEE. This is an incorrect statement as PSCIPCO is not subject to subpart EEEEE. PSCIPCO is subject to 40 CFR 63, subpart ZZZZZ, which are [sic] the NESHAP for Iron and Steel Foundries Area Sources. PSCIPCO's current Approval Order recognizes that PSCIPCO is subject to subpart ZZZZZ, but not subpart EEEEE. Moreover, UDAQ's RACT evaluation for PSCIPCO recognizes PSCIPCO is subject to subpart ZZZZZ and not subpart EEEEE.

Consequently, PSCIPCO requests that the provisions for PSCIPCO contained in the document titled Current List of Changes to Part H be revised to read:

In addition, the facility is subject to 40 CFR 63 Subpart ZZZZZ which requires operation of the cupola as to minimize emissions during startup and shutdown periods by creating a startup, shutdown, and malfunction plan (SSMP).

DAQ Response: UDAQ agrees with this comment. The change will be made as suggested by the commenter.

Comment ES-20: Comment regarding the proposed VOC limit for PSCIPCO: Subsection IX.H.13.d(i). The proposed PM2.5 SIP states, By January 1, 2015, all VOC emissions shall be limited to 118.66 tons per rolling 12-month period. In contrast, the PM2.5 SIP approved in January 2014 set the same VOC emission limitation at 141.84 tpy. PSICIPCO and UDAQ staff discussed the reduction from 141.84 tpy to 118.66 tpy during the same October 9 meeting. During this meeting, Ms. Harry reported that UDAQ erred when it set the original VOC limit at 141.84 tpy; the 141.84 tpy limitation, according to Ms. Harry, was the difference between PSCIPCO's current permit limit of 260 tpy and the amount of VOC's provided by PSCIPCO for its coating operations plus an amount for other plant operations. PSCIPCO reviewed the documentation it submitted for the PM2.5 SIP planning process and disagrees with this assessment. PSCIPCO provided to UDAQ a potential to emit (PTE) inventory at the start of the PM2.5 planning process. Attachment A provides a summary of changes pertaining only to VOC PTEs as part of this SIP rulemaking. VOC PTE emissions submitted in the October 31, 2013 correspondence were specific to the coating process, not to the entire facility. When all VOC PTE [sic] for PSCIPCO is totaled, as seen in Attachment A, the final value is 140.85, similar to the 141.84 in the currently approved SIP. Accordingly, PSCIPCO requests that UDAQ revise Part IX.H.13.d(i) to state that VOC emissions are limited to 140.85 tpy. Furthermore, the VOC emission limitation is also stated in the document titled Current List of Changes to Part H and PSCIPCO requests that UDAQ revise that document to recognize that PSCIPCO's VOC emissions are limited to 140.85 tpy.

DAQ Response: UDAQ has reviewed the documentation submitted by the commenter and agrees with the comment. After inclusion of the sources unrelated to coating operations UDAQ agrees that PSCIPCO's VOC total should be 140.85 tpy. The appropriate changes will be made in IX.H.13.d(i). The document titled "Current List of Changes to Part H" was an explanatory document made for the Air Quality Board prior to, and in preparation of, the public comment period, and is no longer applicable in any event. A similar document will most likely be prepared summarizing the changes resulting from public comments.

Comments from Tesoro Refining and Marketing (Comment ES-21)

Comment ES-21: The October 1, 2014 RACT Evaluation Report for the Tesoro Salt Lake City Refinery, Section 5.0 Implementation Schedule, page 15 states "NOx controls for the Ultraformer Unit are scheduled for May of 2015." On March 13, 2014, DAQ (DAQE-012-14) requested that Tesoro identify the earliest possible date that the RACT controls required by the SIP, [sic] can be implemented. Tesoro identified several RACT controls which could be expedited including a potential May 2015 install date for the ultraformer unit low NOx burners. Tesoro has since determined that the engineering for the low NOx burners was complex that initially estimated. The low NOx burners are now estimated to be installed during the 2016 ultraformer outage. The delayed installation will have no impact on Tesoro meeting the requirements in Subsections IX.11 and IX.12 [sic].

DAQ Response: UDAQ acknowledges this comment. As stated by the commenter, the updated RACT Evaluation Reports include a new Section 5 which lists an expected implementation schedule for the required controls for each listed source. Where possible, UDAQ also assigned specific Part H limits to these controls – either in Part H.11 General Requirements, or H.12 / H.13 for individual listed sources. However, when this was not possible – such as for sources with plant-wide SIP Cap allowables – a more general approach was taken. This was the case with the refineries, and with Tesoro in particular. In this circumstance, an appropriate date was assigned for the SIP Cap based on the anticipated completion date of **all** required controls necessary to achieve that Cap. While individual sub-control processes may have earlier anticipated completion dates, no specific limitation is required so long as the end result is still achieved. This allows for flexibility in long term planning and execution on such large capital projects. As the installation of the low NOx burners is required only for realization of the NOx SIP Cap, UDAQ agrees with Tesoro's assessment and acknowledges this comment. No further action is required.

Comments from Compass Minerals (Comments ES-22 through ES-23)

Comment ES-22: Compass has several concerns relating to the stack testing requirements and timeframes for the establishment of PM limits set forth in the Draft SIP. First, the Draft SIP requires compliance stack tests to be completed by January 1, 2015. In cases where limits in the Draft SIP have not changed from historic approval orders, and previously conducted stack tests are within the currently mandated testing cycle, UDAQ should allow such previously conducted stack tests to be utilized for SIP compliance demonstration. Such a compromise would save money and give Compass and other facilities some flexibility and extra time to complete the required stack testing. Similarly, the Draft SIP requires sources to establish PM2.5 emission limits within 120 days of the compliance test date-January 1, 2015. This requirement is also impractical in light of the number of sources to test and the short amount of time to analyze the information in an adequate way to set a reasonable $PM_{2.5}$ limit.

Furthermore, the standard Method 20la and Method 202 for testing $PM_{2.5}$ emissions from dryers does not work for dryers controlled by wet gas scrubbers that contain moisture (i.e. water droplets) in the emission stream. See 40 C.F.R Part 51, App. M. UDAQ acknowledges that other test methods may be more appropriate in certain circumstances, which is why in the general stack testing requirements of the Draft SIP, UDAQ states that sources may use "other EPA approved testing methods acceptable to the director." See Draft SIP Part H.1l.e.C. Compass will need to discuss with UDAQ the option of using another more accurate test method than 20la or 202 for testing the PM16 and $PM_{2.5}$ emissions from its dryers in order to establish an accurate $PM_{2.5}$ limit. This will understandably take more time than the allotted 120 day time frame because each testing methodology must be approved by UDAQ and then implemented by the source.

DAQ Response: The UDAQ agrees that it is unreasonable to require stack testing by January 1, 2015. The stack sampling compliance test date in H.12.h.ii.a and H.12 h.iii.a will be revised to no later than June 1, 2015, and the PM2.5 emission limits shall be established within 120 days of the compliance test date.

Comment ES-23: In the Draft SIP Part H.12.h.iv, UDAQ has imposed the requirement that for all of Compass's dryers, Low NOx burner technology with a minimum manufacturer guarantee of 77% NOx removal efficiency must be installed by January 1, 2017. This requirement is problematic for a number of reasons. First, it is unclear what the 77% removal efficiency is referring to. "Removal efficiency" generally refers to how much of a pollutant is being reduced using post combustion pollution controls, such as the removal of 99% of the particulate from an emission stream by installing a baghouse. However, Compass is not proposing to install secondary pollution control technology for its dryers. Therefore, the only other logical interpretation of this requirement is that Compass must install a Low NOx burner system as a retrofit to its dryers that achieves 77% reduction in NOx as compared to the emissions generated by conventional dryer systems. Compass is not certain that this is the correct interpretation of the requirement. Given the uncertainty surrounding this requirement, Compass proposes that UDAQ simply impose a 20 ppm NOx limit at 3% oxygen on the Compass dryers. Such a limit would reflect the level of control achievable by the installation of Low NOx Burners in the Compass dryers. The second problem with the 77% NOx reduction requirement is that no manufacturer is going to guarantee a77% removal efficiency of NOx from commercial dryers. This percentage reduction was presumably generated by performing a calculation of the AP-42 emission factor for natural gas combustion and the reduction achieved by imposing a 20 ppm NOx value promised by an undisclosed vendor. A vendor would be unable to verify such a calculation as estimated emission levels and thus, could not guarantee

any percentage of reduction. This is especially true where the baseline from which to calculate the percentage reduction is unclear.

In light of the problems associated with the 77% NOx reduction requirement, Compass believes limiting its dryers to 20 ppm of NOx is the most reasonable approach for UDAQ to impose in the Draft SIP.

DAQ Response: The 77% reduction resulted from the RACT analysis. The data in the RACT analysis showed that the use of LNB technology with a minimum NOx control efficiency of 77% is both technically and economically feasible, and this technology was selected as RACT. If a LNB rated at 20 ppm NOx achieves reductions of at least 77% NOx from the current burner technology at each dryer, that burner meets RACT. UDAQ suggests Compass Minerals perform the calculations to determine what burner rating will achieve the NOx reduction goals identified in the RACT report and then purchase LNB that meet that rating. No change will be made to Part H.IX.11.h.iv.

Comments from Rio Tinto (Comments ES-24 through ES-27)

Comment ES-24: Subpart H requirements for the Smelter are provided on pages 31 and 32 of DAQE-075-14. The Homan boiler operating at the Smelter is not equipped with CEMs. KUC would like to propose that condition n.i.C be revised to read as following:
Startup/shutdown NOx and SO, emissions are monitored by CEMS or alternative monitoring programs during startup/shutdown operations. The pertinent additions to the conditions have been underlined.

DAQ Response: Section IX, Subpart H.12.n.i.C will be modified to read as follows:
C. NO_x and SO_2 emissions are monitored by CEMS or alternate method determined according to applicable NSPS standards during startup/shutdown operations.

Comment ES-25: Subpart H requirements for the Bingham Canyon Mine are provided on page 26 of DAQE-075-14. Consistent with these conditions, KUC will reduce combined emissions of PM2.5, NOx and SO2, by 620 tons per year by 1/1/19. These reductions are being required beyond the RACT analyses performed and approved by UDAQ. Specifically, the RACT analysis showed that current operating practices at the Bingham Canyon Mine represent RACT. UDAQ's RACT determination found that there were no additional controls that were currently available that KUC could implement to reduce emissions from the BCM. Yet, in the draft Part H Emission Limits, UDAQ requires KUC to reduce the Bingham Canyon Mine's annual emissions by 10% by 2019. KUC will, of course, work toward finding a method of meeting the requirements that UDAQ has proposed for BCM. However, UDAQ's proposed Part H emission limits will put KUC in the difficult, position of being required to cut emissions without an identified solution except curtailing operations.

DAQ Response: UDAQ acknowledges receipt of this comment. No action is required.

Comment ES-26: Emissions modeled for the Bingham Canyon Mine are listed in Table 6.3 of DAQE-075-14 (a) and reflected in the total emissions from point sources in the Salt Lake City nonattainment area. The Table 6.3 provides actual emissions for 2010 and projected emissions for 2015 for all point sources on a typical winter day. For the Bingham Canyon Mine, these emission rates are not consistent with emissions projections discussed and agreed upon with UDAQ. Table 6.3 shows a significant underestimation of emissions modeled for the Bingham Canyon Mine. KUC requests that UDAQ revise the emissions for the Bingham Canyon Mine SIP modeling consistent with the table shown below. This request is consistent with the emails received from Nando Meli and Marty Gray (attached) of UDAQ on September 13, 2013 and September 25, 2014 respectively.

DAQ Response: The spreadsheet for the BCM that was used for this demonstration contained emissions that utilized the 2008 true-up amount of 4,620.7 tpy (12.7 tpd) minus the NO_x reduction of 64.7 tpy from the haul truck upgrades. This left 4,556 tpy (12.5 tpd).
UDAQ should have used the existing PTE at the BCM where the NO_x limit is set at 5,829 tpy, reduced to 90% of the PTE (5,246.1 tpy or14.4 tpd) per our convention for newly modified sources with no actual emission data, and then reduced again by 64.7 tpy (5,181.4 tpy or14.2 tpd) to reflect the upgrade in the haul truck engines (kitchen sink).

This demonstration using kitchen sink (best) controls for 2015 emissions showed that under the most controlled scenario for all point sources, attainment was not achieved. Were UDAQ to redo the modeling using the higher emissions, attainment would still not be demonstrated.

No BCM limits in Part H of the SIP were changed due to this modeling demonstration.

Comment ES-27: New Source Review/Banked Emission Reduction Credits are discussed on Page 58 of DAQE-075-14 (a). To further clarify the language related to the use of banked emission reduction credits for the future permitting actions, KUC would like to propose the following addition, consistent with the discussion between UDAQ and the Air Quality Board on September 3, 2014, lines 10 and 11 of that page. "The PM2.5 SIP adopted by the Air Quality Board on December 4, 2013 did not include banked PM2.5 or PM2.5 precursor ERCs in the attainment demonstration and therefore under R307-403-8 any ERCs that were banked prior to December 4,2013 may not be used as PM2.5 major source or major modification emission offsets for PM2.5 nonattainment areas." The pertinent additions to the language in the SIP have been underlined. KUC believes that the proposed addition clarifies the viability of emission reduction credits for future permitting activities.

DAQ Response: The UDAQ agrees the proposed language clarifies the actual intent of the SIP language. The language will be added for clarification.

Technical Support Document Comments

Comment TSD-1 (From EPA Enclosure III, 1): In the Weight of Evidence TSD, on Page 4.e-15 Sec.1.2.2, clarification of written language is recommended.

DAQ Response: UDAQ agrees that the language should be updated and modified. The updated Weight of Evidence TSD now includes EPA's recommendation:

> *"The design value period of2008-2012 ensures that most recent 98th percentile data available when the modeling effort began was used. The year 2014 was omitted given that the 98th percentile value is a yearly value, and the 2013 calendar year had not been completed when the modeling was initiated."*
>
> *"Figure 1.5 displays 98th percentile values and five year average design value history for the Hawthorne monitor in Salt Lake City and the Lindon monitor in Utah County for the years 1999-2013."*

Comment TSD-2 (From EPA Enclosure III, 2-a): In the Weight of Evidence TSD, the statement, "1999 could not be included due to the fact that PM2.5 monitoring started in 2000" is inaccurate because PM2.5 monitoring was conducted for the full calendar year of 1999.

DAQ Response: UDAQ agrees that PM2.5 monitoring data is available for 1999 and the current statement used in the Weight of Evidence TSD is inaccurate. UDAQ has updated the language in the Weight of Evidence TSD as shown below:

> *"An analysis of inversion strength for the years 2000-2013 is shown in Figure 1.6. Time series of twenty-four-hour PM2.5 values and inversion strength for the last fourteen years are displayed during the time frame of Dec. 1 – Feb. 28. Note that 24-hr PM2.5 data was collected by Utah DAQ in 1999 but is not part of this analysis."*

Comment TSD-3 (From EPA Enclosure III, 2-b): On page 4.d-19 of the Weight of Evidence TSD, the phrase, "2013 should be excluded" is not supported by the trends analysis and EPA does not agree that 2013 data should be excluded for any regulatory purpose, now or in the future.

DAQ Response: UDAQ agrees with EPA that 2013 data should not be excluded for any regulatory purpose. UDAQ will eliminate the phrase "2013 should be excluded," as the yearly trend analysis of the Inversion Strength and 24-hr $PM_{2.5}$ should not be used to eliminate data from a regulatory analysis. UDAQ's analysis does examine the differences in snow, surface temperature, inversion strength, and 24-hr $PM_{2.5}$ between the 2012 and 2013 data, but language speaking to the "extremeness" of these two particular years has been toned down in the updated Weight of Evidence.

Transportation and I/M

Comment T-1 (From EPA Enclosure IV, 1-a): The state should provide a RACM analysis for the I/M program to show that it meets the RACM requirement.

DAQ Response: We agree and will develop a RACM analysis. This analysis will be added to the TSD.

Comment T-2 (From EPA Enclosure IV, 1-b): EPA requested verification of emission reductions from the Cache County Vehicle Inspection and Maintenance Program I\M program.

DAQ Response: Upon EPA's request DAQ has verified the emissions reductions from the Cache County Vehicle Inspection and Maintenance Program I\M program. DAQ found that the emissions credit for the Cache County I\M program in 2015 is .214 tons per day for NOx and .212 tons per day for VOC. When the credit is rounded down, both NOx and VOC receive identical credit of .21 tons per day. There is no error in how the NOx and VOC emission credits were modeled. The SIP will be updated with the tons per day out to the thousands place to avoid any confusion.

Comment T-3 (From EPA Enclosure IV, 1-c): EPA indicated that there were inconsistencies in the Logan (UT-ID) $PM_{2.5}$ Nonattainment Area SIP between SIP Identified Motor Vehicle Emissions Budgets (MVEB) and SIP Emissions Inventory Data.

DAQ Response: DAQ agrees with EPA that there were inconsistencies in the Logan (UT-ID) $PM_{2.5}$ Nonattainment Area SIP between SIP Identified Motor Vehicle Emissions Budgets (MVEB) and SIP Emissions Inventory Data.

DAQ identified summary reporting errors in SIP Emissions Inventory Data in tables 4.1 (page 27) and 4.2 (page29) in the Logan (UT-ID), Salt Lake City (UT), and Provo (UT) $PM_{2.5}$ Nonattainment Area SIPs. The summary reporting errors were the result of condensing expansive Motor Vehicle Emission Simulator (MOVES) model outputs that had been processed by the Sparse Matrix Operator Kernel Emissions Model (SMOKE) for summary tables 4.1 and 4.2. These summary tables had rounding errors for on-road mobile sources and in addition did not include on-road mobile source road dust. DAQ corrected the summary errors with on-road mobile emissions summaries directly from the AP-42 (road dust) calculation and MOVES model output. The summary emissions reporting errors were a context error and had no impact on the actual on-road mobile emissions utilized within the photochemical model. All mobile source emissions were evaluated correctly by the photochemical model.

DAQ agrees with EPA that the 2015 $PM_{2.5}$ emissions in the inventory table and Motor Vehicle Emissions Budget (MVEB) table do not match in the Logan (UT-ID) $PM_{2.5}$ Nonattainment Area SIP. The Logan, (UT-ID) Nonattainment Area SIP reported .28 tons of $PM_{2.5}$ from mobile sources in 2015. The $PM_{2.5}$ emissions summary contained a rounding error and in addition did not include road dust. The Logan, UT-ID Nonattainment Area will now reflect .67 tons per day of $PM_{2.5}$ in 2010 and .64 tons per day of

$PM_{2.5}$ in 2015. Two notes will be added to table 4.1 and 4.2. (Note 1: $PM_{2.5}$ for mobile sources includes tire and brake wear, sulfate, elemental and organic carbon, and road dust. Note 2: Mobile source emissions summaries are from the AP-42 (road dust) and MOVES model output.) Table 7.1 in the Logan, UT-ID Nonattainment Area has the correct Motor Vehicle Emission Budget for $PM_{2.5}$ at .32 tons per day. A note to Table 7.1 will be added explaining that the mobile source $PM_{2.5}$ budget only includes tire and brake wear, sulfate, elemental and organic carbon. (Note: $PM_{2.5}$ budget only includes tire and brake wear, sulfate, elemental and organic carbon and does not include road dust.)

DAQ disagrees with EPA that there is an inconsistency between the Inventory Table 4.2 and the Motor Vehicle Emission Budget (MVEB) in Table 7.1 for VOC emissions in the Logan, UT-ID Nonattainment Area SIP. The VOC emissions reported in the Inventory Table 4.1 and 4.2 in the Logan (UT-ID), Salt Lake City (UT), and Provo (UT) $PM_{2.5}$ Nonattainment Area SIPs include refueling spillage and displacement vapor loss emissions. The Logan, UT-ID Nonattainment Area MVEB table 7.1 for VOC emissions does not include refueling spillage and displacement vapor loss emissions and there is a note at the bottom of table 7.1 clarifying this in detail. The VOC emissions in the Inventory tables 4.1 and 4.2 are larger than the VOC emissions in the MVEB table 7.1. For clarification a note will be added to the Inventory tables 4.1 and 4.2 in all SIPs indicating that the VOC emissions include refueling spillage and displacement vapor loss emissions. (Note 3: VOC for mobile sources includes refueling spillage and displacement vapor loss emissions.) Refueling emissions are calculated utilizing the EPA approved Motor Vehicle Emission Simulator model (MOVES). Technically refueling emissions are an area source category. The refueling emissions were included in the mobile inventory for air modeling purposes. Refueling emissions have been included as an item within the mobile inventory since the calculation was performed within MOVES.

Comment T-4 (From Utah Division of Air Quality): While reviewing the on-road mobile source SIP summary tables DAQ found that there were errors in the 2015 mobile summary table in the Technical Support Document for On-Road Mobile Sources found on page 4. The summary table did not report the correct emissions summaries for Total PM_{10}, Total $PM_{2.5}$, or $PM_{2.5}$ road dust. Total PM_{10} had an error for all counties and included elemental and organic carbon but did not include: tire and brake wear, and sulfate. Total PM_{10} will be corrected for all counties to include elemental and organic carbon, tire and brake wear, and sulfate. PM_{10} road dust summary for all counties is correct and summarized as a separate category. The Total $PM_{2.5}$ for Cache County had an error and included elemental and organic carbon, brake wear, and sulfate but did not include tire wear so the total was .31 tons per day. The Total $PM_{2.5}$ for Cache County will be corrected to include elemental and organic carbon, tire and brake wear, and sulfates and will now total .32 tons per day. The $PM_{2.5}$ road dust for all counties erroneously reported average weekend day emissions. The $PM_{2.5}$ road dust will be corrected to report average weekday emissions. The corrected table has been attached below. The updated and correct emissions have been highlighted below.

Year	FIPS	County	NH3	NOx	Total_PM10	Total_PM25	SO2	VOC	VOC Refueling	PM10 Dust	P
2015	49007	Carbon	0.03	1.75	0.11	0.09	0.01	0.90	0.04	0.62	(
2015	49013	Duchesne	0.02	1.47	0.10	0.08	0.01	0.77	0.03	0.42	(
2015	49015	Emery	0.03	2.26	0.11	0.09	0.01	0.55	0.04	0.46	(
2015	49023	Juab	0.04	2.26	0.10	0.09	0.01	0.52	0.04	0.25	(
2015	49027	Millard	0.04	2.75	0.13	0.11	0.01	0.67	0.05	0.44	(
2015	49029	Morgan	0.01	0.74	0.05	0.04	0.00	0.38	0.01	0.12	(
2015	49033	Rich	0.00	0.19	0.02	0.02	0.00	0.16	0.00	0.05	(
2015	49039	Sanpete	0.02	1.20	0.09	0.07	0.01	0.98	0.03	0.33	(
2015	49043	Summit	0.06	4.63	0.26	0.22	0.02	1.51	0.08	0.93	(
2015	49051	Wasatch	0.03	1.76	0.14	0.10	0.01	0.88	0.04	0.47	(
2015	49003	Box Elder	0.10	6.99	0.40	0.33	0.05	2.35	0.13	0.83	(
2015	49011	Davis	0.28	13.07	1.16	0.88	0.13	7.89	0.33	1.96	(
2015	49035	Salt Lake	0.93	40.68	3.73	2.81	0.40	25.96	1.07	6.66	1
2015	49045	Tooele	0.10	6.56	0.47	0.36	0.05	3.01	0.15	1.87	(
2015	49057	Weber	0.18	10.30	0.86	0.66	0.09	6.2	0.24	1.33	(
2015	49049	Utah	0.45	21.48	1.84	1.38	0.16	12.6	0.51	3.95	(
2015	49005	Cache	0.10	4.49	0.44	0.32	0.03	3.23	0.13	1.28	(

Comment T-5 (From EPA Enclosure IV, 2-a): With regard to an on-road mobile sources vehicle I/M program evaluation; the SIP Narrative states the following on document page 58:

> "A decentralized, test-and-repair program was evaluated for Box Elder and Tooele counties within the nonattainment area. For the evaluation, all model year 1968 and newer vehicles would be subject to a biennial test except for exempt vehicles. The program would exempt vehicles less than four years old as of January 1 on any given year from an emissions inspection. Year 1996 and newer vehicles would be subject to an On-Board Diagnostics (OBD) inspection. Year 1995 and older vehicles would be subject to a two-speed idle inspection (TSI). Based on this evaluation, this program was not included because it was determined that implementation of such a program would not affect PM2.s concentrations at the controlling monitor (Hawthorne) for the Salt Lake-Ogden-Clearfield nonattainment area." Additional information is provided in the Technical Support Document."

EPA notes there would have been emission reductions of NOx and VOCs identified with the State's evaluation. Taken only by themselves, these VM emission reductions may not have shown a modeled difference at the Hawthorne monitor. However, such an I/M program would likely produce viable PM2.5 precursor emission reductions of NOx and VOCs for the Salt Lake-Ogden-Clearfield nonattainment area. UDAQ has not provided EPA with their evaluation, and it would be helpful in our review to see UDAQ's analysis, with the estimated potential emission reductions from an I/M program, to further understand the State's conclusion. We note that Section 5.e of the TSD ("Control Strategies, On-Road Mobile Sources") only provides the following additional paragraph regarding this question:

"UDAQ also tested the inclusion of the above l/M programs in both Box Elder and Tooele counties within the Salt Lake nonattainment area. However, photochemistry model sensitivity runs revealed that the effect of these controls on PM2.s concentrations at the controlling air monitor located at Hawthorne Elementary School (1675 South 600 East in Salt Lake City, Utah at an elevation of 1306 m or 4285 ft) was negligible. Therefore, the effectiveness of an l/M program was not included in the modeling in either of these counties. However, I/M programs already exist in Salt Lake, Davis, Utah, and Weber counties and are reflected in the inventories."

EPA would appreciate being able to review the modeled I/M NOx and VOC emission reductions (as in tons per day) for Box Elder and Tooele Counties. We could then compare such I/M emission reductions from Box Elder and Tooele Counties to other Utah county I/M programs to further understand the State's position.

DAQ Response: UDAQ performed zero out emissions sensitivities for Box Elder and Tooele Counties with the CMAQ photochemical model. In these sensitivities, the emissions from these counties are eliminated or "zeroed" out. Then the CMAQ photochemical model is run and the results of the "zeroed" out sensitivity is compared to a "base" CMAQ run which contains all emissions. The results of these runs showed that the emission reduction by I/M in these counties were negligible. UDAQ will include more information in the TSD.

Comment T-6 (From EPA Enclosure IV, 2-b): Regarding the SIP for the Salt Lake City nonattainment area, the narrative in Section 7.3 "Regional Emission Analysis", indicates (as shown below) that only an interim emissions test will be required of the Metropolitan Planning Organization.

"*The satisfaction of criteria and procedures, for implementation plans submitted under Section 189(a)(1)(B)(ii) of the CAA, which demonstrate the impracticability of demonstrating attainment of the applicable NAAQS by the applicable attainment date, are addressed in paragraph 93.109(g)(4) of the conformity rule. For such implementation plan revisions, it is the interim emissions tests which must be satisfied, as specified in Section 93.119.*"

Pointing to its more general comments which assert that the SIP for the Salt Lake City nonattainment area should include quantitative milestones for 2017, the commenter states that, under CAA sections 176(c)(1) and 176(c)(2), it should set motor vehicle emission budgets for 2017. Furthermore, that the SIP narrative is inaccurate in describing the conformity rule's provisions, as 40 CFR 93.109(g)(4) only specifically addresses PM_{10} and not 2006 24-hour $PM_{2.5}$, which is the applicable NAAQS for this plan. Also, that 40 CFR 93, Subpart A does not set SIP requirements for MVEBs. Instead, it addresses how to use them in transportation conformity determinations.

DAQ Response: As discussed in the responses to comment G-2 (in response to EPA's comment in Enclosure I, 1-a) and G-4 (in response to EPA's comment in Enclosure I, 1-c) above, this Moderate Area SIP for the Salt Lake City nonattainment area does not show attainment of the 2006 NAAQS for $PM_{2.5}$. Rather, it shows the impracticability of attaining that standard by the attainment date in 2015. Therefore, the quantitative milestones described in Subpart 4, Section 189(c) are not applicable to this plan.

Since there is no milestone required for 2017, there is no corresponding need for a motor vehicle emissions budget in that year.

The SIP narrative presented in Section 7.3 points to paragraph 93.109(g) of the conformity rule for the requirements which are relevant to this plan. Section 93.109 of the conformity rule presents the "Criteria and procedures for determining conformity of transportation plans, programs, and projects: General." The criteria to be satisfied will differ depending on "the action under review…, the relevant pollutant(s), and the status of the implementation plan." Paragraphs (c) through (k) discuss criteria specific to plans addressing certain NAAQS. It is in paragraph (g) that the criteria pertinent to the NAAQS for PM_{10} nonattainment and maintenance plans are addressed.

As discussed in the response to comment G-2 (in response to EPA's comment in Enclosure I, 1-a), the Moderate Area planning requirements under paragraph 189(a)(1)(B)(ii) in Subpart 4 of the CAA are very unique in allowing for "either (i) a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment date; or (ii) a demonstration that attainment by such date is impracticable."

Nowhere else in the CAA is this option permissible. The general SIP requirements of Section 172(c) call for plan provisions that "…shall provide for attainment of the national primary ambient air quality standards." Even under paragraph 189(b)(1)(A) in Subpart 4, plan provisions for areas reclassified as Serious require a demonstration of attainment, either by the applicable attainment date or by the most expeditious alternative date practicable.

Thus, paragraph 93.109(g) of the conformity rule, in its attention to PM_{10} nonattainment and maintenance areas, includes (in subparagraph (4))the only discussion of what criteria apply "(ii) If the submitted implementation plan revision is a demonstration of impracticability under CAA section 189(a)(1)(B)(ii) and does not demonstrate attainment." In such case the conformity rule requires that "the interim emissions tests must be satisfied as required by Section 93.119."

To the commenter's claim that 40 CFR 93.109(g)(4) only specifically addresses PM_{10} and not 2006 24-hour $PM_{2.5}$, which is the applicable NAAQS for this plan, the same might be said of Subpart 4 of title I of the Clean Air Act itself. Nevertheless, the decision by the D.C. Circuit Court has compelled the application of these provisions to the 2006 NAAQS for $PM_{2.5}$.

It's notable that this decision by the Court was rendered only after the conformity rule and its treatment of plan revisions addressing the NAAQS for $PM_{2.5}$ was promulgated.

This highlights yet another instance where the lack of any implementation guidance for $PM_{2.5}$ has made the preparation of these plans more difficult. It would seem that EPA needs to consider the unique provisions of paragraph 189(a)(1)(B)(ii), not just in the implementation guidance, but in the conformity rule as well . Absent that, UDAQ believes that the application of paragraph 93.109(g) of the conformity rule to the circumstance of the Moderate Area $PM_{2.5}$ SIP for the Salt Lake City nonattainment area is entirely appropriate.

It's also notable that this issue was addressed by EPA Region 9 in its initial approval and promulgation of a PM_{10} SIP for the Phoenix Planning Area (PPA) (FR Vol. 60, No. 68, April 10, 1995, pp. 18010). In responding to comment, the Region writes: "EPA does not agree that the State was required to identify a

mobile source emission budget. The moderate SIP revision for the PPA demonstrates that attainment of the PM_{10} NAAQS is impracticable by December 31, 1994. Mobile source emission budgets are only required to be identified in SIP revisions which demonstrate attainment. The preamble to EPA's transportation conformity rule states:

> Some moderate PM_{10} nonattainment areas may have submitted SIPs which demonstrate that the area cannot attain the PM_{10} standard by the applicable attainment date. These areas have been or will be reclassified as serious areas under section 188(b) of the Clean Air Act. Such SIPs which do not demonstrate attainment do not have budgets and are not considered control strategy SIPs for the purposes of transportation conformity. 58 FR 62196, November 24, 1993.

Thus, EPA's transportation conformity rule explicitly contemplated and determined that PM_{10} areas demonstrating impracticability, like the PPA, would not have provided for and would not be required to identify a mobile source emission budget until an approvable attainment demonstration is submitted."

As the Serious Area SIPs are developed motor vehicle emissions budgets (MVEB) will certainly be included, as they had been under the Subpart 1 SIPs. The attainment date under the Serious Area planning requirements will be December 31, 2019. As such, MVEB will be established for 2019. Mobile source emissions in 2019 will be less than they were in 2017.

Comment T-7 (From EPA Enclosure IV, 2-c): Regarding the SIP for the Salt Lake City nonattainment area, the narrative in section 8.3 "RFP For the Salt Lake City, UT Nonattainment Area," should contain quantitative milestones for 2017. Since the first milestone year would be 2017, the SIP should identify MVEBs for $PM_{2.5}$, NOx, and VOC for 2017.

DAQ Response: See responses to G-2 (response to EPA's comment in Enclosure I, 1-a), G-4 (in response to EPA's comment in Enclosure I, 1-c), and T-6 (in response to EPA's comment in Enclosure IV, 2-b) above.

Comment T-8 (From EPA Enclosure IV, 3-a): Inclusion of Utah County 1/M Program. The last paragraph on page 51, lines 18 to 22, of the SIP Narrative discusses existing SIP controls that include the l/M programs. The l/M programs for Davis, Salt Lake, and Weber Counties are discussed, but not the l/M program for Utah County. This paragraph should delete the information on the other three counties and include and focus on the l/M program in Utah County.

DAQ Response: We agree, and the text for this paragraph will be modified as follows:

To supplement the federal motor vehicle control program, Inspection/Maintenance (I/M) Programs were implemented in [~~Salt Lake and Davis Counties in 1984~~]Utah County in 1986. [~~A program for Weber County was added in 1990.~~] Th[~~ese~~]is program[~~s~~] ha[~~ve~~]s been effective in identifying vehicles that no longer meet the emission specifications for their respective makes and models, and in ensuring that those vehicles are repaired in a timely manner.

Comment T-9 (From EPA Enclosure IV, 3-b): At the bottom of page 61 and the top of page 62 of the SIP Narrative appears the discussion regarding the State's evaluation of an l/M program for Box Elder and Tooele Counties. This is irrelevant information for the Provo $PM_{2.5}$ SIP revision and should be removed.

DAQ Response: We agree and will revise this language in the Provo $PM_{2.5}$ SIP as shown below:

On-road mobile sources:
[~~A decentralized, test-and-repair program was evaluated for Box Elder and Tooele counties within the nonattainment area. For the evaluation, all model year 1968 and newer vehicles would be subject to a biennial test except for exempt vehicles. The program would exempt vehicles less than four years old as of January 1 on any given year from an emissions inspection. Year 1996 and newer vehicles would be subject to an On-Board Diagnostics (OBD) inspection. Year 1995 and older vehicles would be subject to a two-speed idle inspection (TSI). Based on this evaluation, this program was not included because it was determined that implementation of such a program would not affect PM 2.5 concentrations at the controlling monitor (Hawthorne) for the Salt Lake-Ogden-Clearfield nonattainment area. Additional information is provided in the Technical Support Document.~~]
Beyond the existing I/M program in Utah County, there are no emission controls that were implemented for this source category.

Comment T-10 (From EPA Enclosure IV, 3-c): Regarding the SIP for the Provo nonattainment area, the narrative in section 7.3 “Regional Emission Analysis”, indicates (as shown below) that only an interim emissions test will be required of the Metropolitan Planning Organization.

> "*The satisfaction of criteria and procedures, for implementation plans submitted under Section 189(a)(1)(B)(ii) of the CAA, which demonstrate the impracticability of demonstrating attainment of the applicable NAAQS by the applicable attainment date, are addressed in paragraph 93.109(g)(4) of the conformity rule. For such implementation plan revisions, it is the interim emissions tests which must be satisfied, as specified in Section 93.119.*"

Pointing to its more general comments which assert that the SIP for the Provo nonattainment area should include quantitative milestones for 2017, the commenter states that, under CAA sections 176(c)(1) and 176(c)(2), it should set motor vehicle emission budgets for 2017. Furthermore, that the SIP narrative is inaccurate in describing the conformity rule’s provisions, as 40 CFR 93.109(g)(4) only specifically addresses PM_{10} and not 2006 24-hour $PM_{2.5}$, which is the applicable NAAQS for this plan. Also, that 40 CFR 93, Subpart A does not set SIP requirements for MVEBs. Instead, it addresses how to use them in transportation conformity determinations.

DAQ Response: This same comment, as it pertains to the Provo $PM_{2.5}$ nonattainment area, was made with regard to the Salt Lake City $PM_{2.5}$ nonattainment area. The comment and the response are the same. See response to comment T-6 above.

Comment T-11 (From EPA Enclosure IV, 3-d): Regarding the SIP for the Provo nonattainment area, the narrative in section 8.3 "RFP For the Provo, UT Nonattainment Area", should contain quantitative milestones for 2017. Since the first milestone year would be 2017, the SIP should identify MVEBs for $PM_{2.5}$, NOx, and VOC for 2017.

DAQ Response: This same comment, as it pertains to the Provo $PM_{2.5}$ nonattainment area, was made with regard to the Salt Lake City $PM_{2.5}$ nonattainment area. The comment and the response are the same. See responses to comments G-2 (response to EPA's comment in Enclosure I, 1-a), G-4 (in response to EPA's comment in Enclosure I, 1-c), and T-6 (in response to EPA's comment in Enclosure IV, 2-b) above.