UTAH

2011 AIR MONITORING NETWORK PLAN

Prepared by the Division of Air Quality

Utah State Department of Environmental Quality

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MONITORING NETWORK PLAN

1.0 INTRODUCTION

This Air Monitoring Network Plan meets the requirements of 40 CFR 58.10(a)(1). The purpose of this plan is to describe the establishment and maintenance of an air quality monitoring network in Utah. This network consists of State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitoring (SPM) sites.

The Utah air monitoring network has been described in network reviews from 1982 through 2010. A complete description of each historical monitoring station is on file at the Department of Environmental Quality and is available to review upon request. Monitoring sites that will be retained for 2011 are presented in section 1.5.

1.1 COMMENTS ON UTAH AIR MONITORING NETWORK PLAN

This Monitoring Network Plan will be made available for public review for 30 days starting June 1, 2011 to July 1, 2011. Comments can be sent to: Utah Department of Environmental Quality, Division of Air Quality, Attn: R. Neal Olson, PO Box 144820, Salt Lake City, UT 84114-4820

Comments will be reviewed and retained as attachments to the report.

1.2 CURRENT UTAH AIR MONITORING NETWORK

The following pages list the State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitoring (SPM) sites in Utah's current air monitoring network. Site information includes the location (address), objective, and spatial scale represented by each site. The location identified is the local street address where the monitoring site is situated. The Aerometric Information Retrieval System (AIRS) # is a unique number that identifies the site by state, county, and location in the EPA AIRS database.

Under the listed parameters:

- A station may be designated as a State and Local Air Monitoring Station (SLAMS) or as a Special Purpose Monitor (SPM).

- The spatial scale represented is described in terms of the physical dimensions of the air parcel surrounding an air monitoring station throughout which pollutant concentrations are reasonably homogeneous. The scales used for Utah's network are:

  Micro: Several meters to about 100 meters

Middle:	About 100 to 500 meters
Neighborhood:	About 500 meters to 4 kilometers
Urban:	Overall citywide conditions, usually about 4 to 50 kilometers, (may require more than one station to define)
Regional:	Defines a rural area, usually of reasonably homogeneous geography, extending for tens to hundreds of kilometers

- The monitoring site should represent; population exposure (Population), source impact (Source), highest expected concentration (High), or background concentration (Background).

The following tables provide a technical summary of the current monitoring network including: the parameter(s) monitored/sampled, sampling/analysis method , frequency of data collection, other non-criteria pollutant parameters monitored, latitude, longitude, and other site specific parameters.

In addition, Utah conducts some "survey" monitoring using state funding to get an initial assessment of some areas of interest. This monitoring is less formal than the SPM monitoring discussed above and focuses on a local project or issue. Based on the results of the survey monitoring, the State may determine that more formal monitoring would be appropriate.

1.3 METROPOLITAN STATISTICAL AREAS (MSA)

Population statistics are used to assess various characteristics of populated areas. The primary descriptor used is Metropolitan Statistical Area (MSA). It is convenient to use the MSA designations when discussing air pollution monitoring. Each MSA is composed of a large number of people in similar geographic settings exposed to similar air pollution emissions and similar air pollution concentrations. The MSA for each monitoring site is identified so air pollution concentration for monitoring stations in the same MSA can be compared.

There are five MSA's in Utah. The following populations are based the April 1, 2010 population census from the United States office of management and budget:

Salt Lake MSA	1,124,179
Ogden-Clearfield MSA	547,184
Provo-Orem MSA	526,810
Logan MSA	125,442
St. George MSA	138,115

The following graphic shows the counties that make up each MSA. The monitoring stations in each MSA are identified in the discussion of each monitoring location.

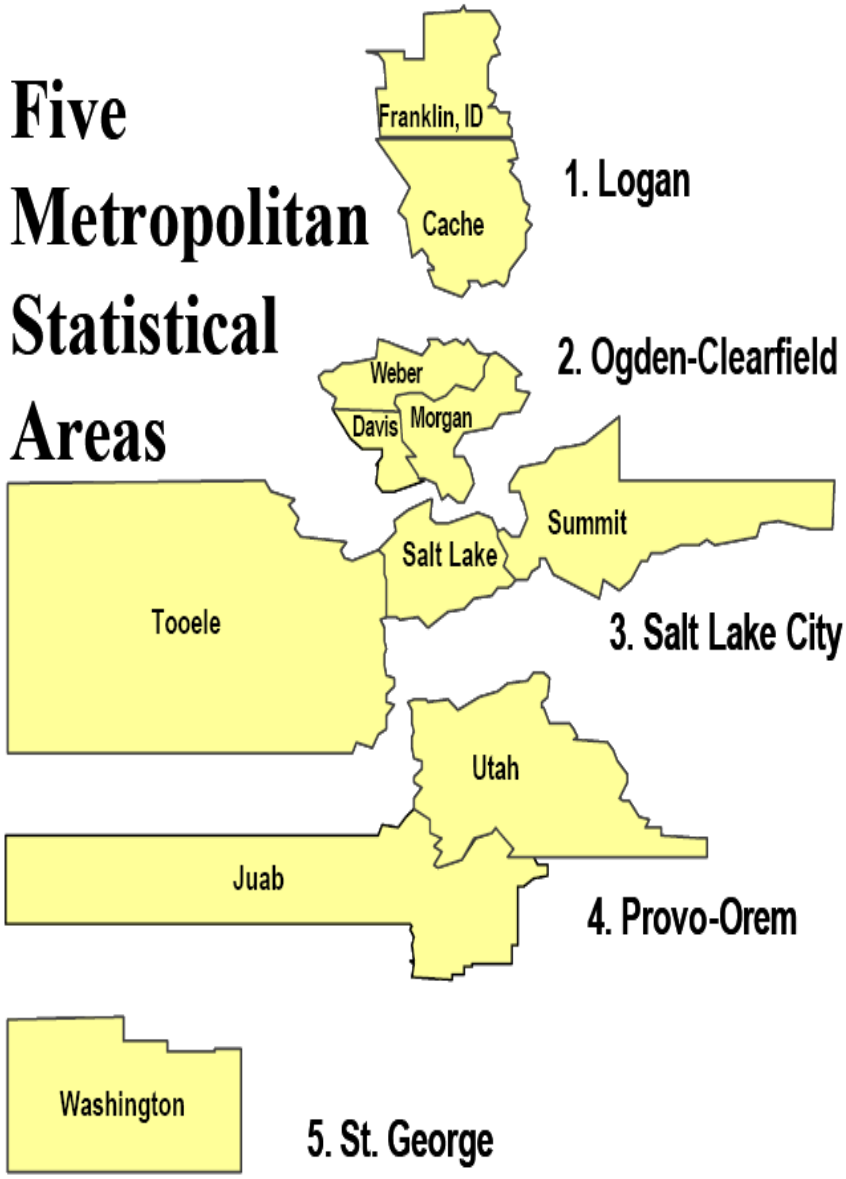

Figure 1

1.4 MONITORING DATA QUALITY ASSURANCE

A Quality Monitoring Plan (QMP) was prepared by the Utah Department of Environmental Quality and approved by EPA Region 8. The air monitoring network meets the criteria identified in the QMP.

A Quality Assurance Project Plan (QAPP) was prepared by the Utah Division of Air Quality and also approved by EPA Region 8. The QAPP identifies in greater detail the monitoring effort and quality assurance procedures the data must meet before it is considered quality assured and acceptable for submittal to the public and EPA.

A Standard Operating Procedure (SOP) manual has been prepared by the Utah Division of Air Quality that identifies the steps, procedures, and criteria that must be met in operating the monitoring network and validating the air pollution data.

1.5 MONITORING SITE DISCUSSION

The following pages discuss each monitoring site and the objective of the monitoring site. The instruments used at each site are also identified. In all cases, the instruments used in the DAQ monitoring network are EPA reference or equivalent instruments. The instruments used to measure the criteria pollutants comply with 40 CFR Part 58, Appendix C.

Two sites have been added for 2011, Price and Fruitland. Modifications to the Hawthorne NCore, Highland, Air Monitoring Center, and Cottonwood sites have been identified.

UTAH AIR MONITORING STATION LOCATION

SITE CODE	STATIONS	CITY	COUNTY	ADDRESS
AMC	Air Monitoring Center	Salt Lake	Salt Lake	2861 W Parkway Blv.
AI	Antelope Island	Not in a city	Davis	Antelope Island
BI	Badger Island	Not in a city	Tooele	Badger Island
B4	Beach #4	Magna	Salt Lake	1200 South 12100 West
BV	Bountiful/Viewmont	Bountiful	Davis	200 West 1380 North
BR	Brigham City	Brigham City	Box Elder	140 West Fishburn
CW	Cottonwood	Holladay	Salt Lake	5717 South 1300 East
FL	Fruitland	Fruitland	Duchesne	6200 South 45000 West
HV	Harrisville	Harrisville	Weber	425 West 2550 North
HW	Hawthorne	Salt Lake	Salt Lake	1675 South 600 East
HG	Highland	Highland	Utah	10865 North 6000 West
LN	Lindon	Lindon	Utah	30 North Main
L4	Logan #4	Logan	Cache	125 West Center Street
MG	Magna	Magna	Salt Lake	2935 South 8560 West
NP	North Provo	Provo	Utah	1355 North 200 West
N2	North Salt Lake #2	Salt Lake	Salt Lake	1795 North Warm Springs Rd
O2	Ogden #2	Ogden	Weber	228 East 32nd Street
P2	Price	Price	Carbon	351 South Weasel Run Road
RP	Rose Park	Salt Lake City	Salt Lake	1354 West Goodwin Ave
SA	Saltaire	Salt Lake City	Salt Lake	6640 West 1680 North
SC	Santa Clara	Santa Clara	Washington	1215 N Lava Flow Dr.
SF	Spanish Fork	Spanish Fork	Utah	312 West 2050 North
SY	Syracuse	Syracuse	Davis	4700 West 1700 South
T3	Tooele #3	Tooele	Tooele	434 North 50 West
W2	Washington Blvd #2	Ogden	Weber	2540 South Washington Blvd
WJ	West Jordan	West Jordan	Salt Lake	4540 West 8700 South

Table 1

Site: Air Monitoring Center **Longitude:** 111.9612 **Station Type:** SPM

AQS#: 49-035-3011 **Latitude:** 40.7118 **MSA:** Salt Lake City

Address: 2861 West Parkway Blvd. **Elevation (M):** 1292

City: West Valley

County: Salt Lake

Site Objective:
This site is established to determine mercury in wet deposition and dry deposition.

Does the site meet the objective:
Yes, all objectives are met.

Site Description:
The site is located at the Air Monitoring Center, in the city of West Valley, Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: No

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Dry Dep. Mercury	Cold Vapor Atomic Absorption	Continuous	Population Exposure	SPM- Transport Regional
Wet Dep. Mercury	Manual NADP MDN	Integrated 7 day	Population Exposure	SPM- Transport Regional

Meteorological Parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Pressure	Barometric Pressure Transducer	Continuous	2 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Leaf Wetness		Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Sonic 2D	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Sonic 2D	Continuous	10 meters	Urban

Site:	Antelope Island	**Longitude:**	112.2313	**Station Type:**	SPM
AQS#:	49-011-6001	**Latitude:**	41.0393	**MSA:**	Salt Lake City
Address:	Antelope Island	**Elevation (M):**	1359		
City:					
County:	Davis				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is on Antelope Island state park, near the ranger residences, in Davis County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	6 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	6 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	6 meters	Urban
WD Sigma	Elec. EPA method	Continuous	6 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	6 meters	Urban

Site:	Badger Island	**Longitude:**	112.5620	**Station Type:**	SPM
AQS#:	49-045-6001	**Latitude:**	40.9420	**MSA:**	Salt Lake City
Address:	Badger Island	**Elevation (M):**	1282		
City:					
County:	Tooele				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the south end of the Great Salt Lake on the remnants of Badger Island in Tooele County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Precipitation	Tipping cup	Continuous	2 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. LiCor	Continuous	2 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Beach #4	**Longitude:**	112.2103	**Station Type:**	SLAMS
AQS#:	49-035-2004	**Latitude:**	40.7342	**MSA:**	Salt Lake City
Address:	: 12100 West 1200 South	**Elevation (M):**	1289		
City:	Magna				
County:	Salt Lake				

Site Objective:

This site is established to determine SO_2 concentrations from Kennecott Copper smelter. Ozone is monitored based on an ozone saturation study and the interaction with the Great Salt Lake.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Great Salt Lake Marina on the south east end of the Great Salt Lake.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Bountiful Viewmont **Longitude:** 111.8845 **Station Type:** SLAMS
AQS#: 49-011-0004 **Latitude:** 40.903 **MSA:** Salt Lake City
Address: 1380 North 200 West **Elevation (M):** 1316
City: Bountiful
County: Davis

Site Objective:

The Bountiful Viewmont site is established to determine public exposure to air pollution. The site also is to monitor the ambient air near the oil refineries and local sand and gravel operations. Previous monitoring and saturation studies have recorded high ozone concentrations. This site is chosen for intensive speciation of PM2.5 under the EPA Chemical Speciation Network (CSN) and gaseous Volatile Organic Compounds under the EPA National Air Toxics Trends Network (NTTN) including hexavalent chromium and carbonyl compounds. Nitrogen dioxide is monitored in support of the ozone monitoring.

Does the site meet the objective: Yes, all objectives are met.

Site Description: The site is located near Viewmont High School at the north end of the city of Bountiful, Davis County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS-High Neighborhood
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-Impact Neighborhood
$PM_{2.5}$	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM_{10} metals	Manual Gravimetric	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
PM_{10} metals co-located	Manual Gravimetric	6 samples/year	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Speciation	Manual EPA CSN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
VOC	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Semi-volatile	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Carbonyl compounds	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Hexavalent Chromium	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Black Carbon	Aethalometer	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Pressure	Barometric Pressure Transducer	Continuous	1 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Brigham City	**Longitude:**	112.0176	**Station Type:**	SLAMS
AQS#:	49-003-0003	**Latitude:**	41.4929	**MSA:**	Not in an MSA, but is in the Salt Lake-Ogden-Clearfield CSA
Address:	140 West Fishburn Dr.	**Elevation (M):**	1334		
City:	Brigham City				
County:	Box Elder				

Site Objective:

This site is established to determine the boundary of ozone concentrations greater than the NAAQS and $PM_{2.5}$ comparison to Cache County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in a neighborhood area of Brigham City in Box Elder County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Real time	Instrumental TEOM FDMS	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Cottonwood	**Longitude:**	111.8496	**Station Type:**	SLAMS
AQS#:	49-035-0003	**Latitude:**	40.6446	**MSA:**	Salt Lake City
Address:	5717 South 1300 East	**Elevation (M):**	1338		
City:	Holladay				
County:	Salt Lake				

Site Objective:

This site is established to determine ozone and ozone precursor compounds.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the southeastern section of Salt Lake County at Cottonwood High School.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM_{10} Real time	Instrumental MetOne BAMM	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Fruitland **Longitude:** 110.8403 **Station Type:** Slams

AQS#: 49-013-1001 **Latitude:** 40.2087 **MSA:** Not in an MSA

Address: 6200 South 45000 West **Elevation (M):** 2021

City: Fruitland

County: Duchesne

Site Objective:

This site is established in response to an ozone three state study. This site is funded by the Bureau of Land Management

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

This site is located in a farm field 400 meters south of Utah highway 40. 0.4Km SE of Fruitland

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Continuous	High winter ozone study	Regional
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	High winter ozone study	Regional

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Regional
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Regional
WD Sigma	Elec. EPA method	Continuous	10 meters	Regional
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Regional
Barometric pressure	Pressure transducer	Continuous	2 meter	Regional

Site: Harrisville **Longitude:** 111.9865 **Station Type:** Slams

AQS#: 49-057-1003 **Latitude:** 41.3028 **MSA:** Ogden-Clearfield

Address: 425 West 2550 North **Elevation (M):** 1322

City: Harrisville

County: Weber

Site Objective:

This site is established in response to an ozone saturation study indicating this as a potential high ozone concentration area.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the grounds of an elementary school in the city of Harrisville, Weber County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Background Regional

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Hawthorne	**Longitude:**	111.8721	**Station Type:**	SLAMS
AQS#:	49-035-3006	**Latitude:**	40.7343	**MSA:**	Salt Lake City
Address:	1675 South 600 East	**Elevation (M):**	1312		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:
This site is established to represent the population exposure in the Salt Lake City area. The Hawthorne site is also proposed as the EPA NCore site for Utah.

Does the site meet the objective:
Yes, all current objectives are met. Ncore monitoring began January 2011.

Site Description:
The site is located at Hawthorne Elementary School in the southeast section of Salt Lake City, Salt Lake County .

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide, trace	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS-High Neighborhood
NO_y trace level	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-Population Neighborhood
SO_2 trace level	Pulsed fluorescence	Continuous	Population Exposure	SLAMS-Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Speciation	Manual EPA CSN	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Real time n-core	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM_{10} Real time n-core	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM_{coarse} Real time n-core	Instrumental TEOM FDMS	Continuous	Population Exposure	SLAMS- Population Neighborhood
H2O soluble ions	Instrumental Ion Chromatography	Continuous	Population Exposure	SLAMS- Population Neighborhood
Methane & Non-methane	NDIR of converted carbon	Continuous	Population Exposure	SLAMS- Population Neighborhood
Organic & Elemental Carbon	Instrumental Gas Chromatography	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological Parameters (Hawthorne):

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Pressure	Barometric Pressure Transducer	Continuous	3 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. EPPLY	Continuous	4 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Highland	**Longitude:**	111.8039	**Station Type:**	SLAMS
AQS#:	49-049-5008	**Latitude:**	40.4282	**MSA:**	Provo-Orem
Address:	10865 North 6000 West	**Elevation (M):**	1479		
City:	Highland				
County:	Utah				

Site Objective:

This site is established in response to an ozone saturation study indicating elevated ozone levels. The site is to evaluate ozone concentrations.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at an elementary school in the city of Highland, Utah County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Lindon	**Longitude:**	111.7133	**Station Type:**	SLAMS
AQS#:	49-049-4001	**Latitude:**	40.3396	**MSA:**	Provo-Orem
Address:	30 North Main	**Elevation (M):**	1442		
City:	Lindon				
County:	Utah				

Site Objective:

This site is established to determine particulate matter from commercial and industrial sources. Historically this site has reported the highest particulate matter values in Utah County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Lindon Elementary School in the City of Lindon, Utah County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood
$PM_{2.5}$ Speciation	Manual EPA CSN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric	Daily	Population Exposure	SLAMS-Impact Neighborhood
PM_{10} Real time	Instrumental TEOM	Continuous	Air Pollution Index	SLAMS-Impact Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Logan #4	**Longitude:**	111.8382	**Station Type:**	SLAMS
AQS#:	49-005-0004	**Latitude:**	41.731	**MSA:**	Logan
Address:	125 West Center Street	**Elevation (M):**	1384		
City:	Logan				
County:	Cache				

Site Objective:
This site is established to determine general population exposure based on increased population.

Does the site meet the objective:
Yes, all objectives are met.

Site Description:
The site is located downtown in the city of Logan, Cache County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood
$PM_{2.5}$ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	LiCor	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Magna	**Longitude:**	112.0947	**Station Type:**	SLAMS
AQS#:	49-035-1001	**Latitude:**	40.7068	**MSA:**	Salt Lake City
Address:	2935 South 8560 West	**Elevation (M):**	1308		
City:	Magna				
County:	Salt Lake				

Site Objective:

This site is established to determine SO_2 and particulate matter & lead (Pb) concentrations from Kennecott smelter.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the roof of Brockbank Junior High School in the city of Magna located in western Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-Impact Neighborhood
$PM_{2.5}$	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS-High Neighborhood
Pb	Manual Gravimetric	1 in 6 days	Population Exposure	SLAMS-High Neighborhood
Pb co-located	Manual Gravimetric	1 in 12 days	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	North Provo	**Longitude:**	111.6633	**Station Type:**	SLAMS
AQS#:	49-049-0002	**Latitude:**	40.2538	**MSA:**	Provo-Orem
Address:	1355 North 200 West	**Elevation (M):**	1410		
City:	Provo				
County:	Utah				

Site Objective:

This site is established to determine general population exposure to air pollutants.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at north end of the city of Provo, Utah county. It is located on the grounds of the Dale Rex Army Armory.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM_{10}	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood
PM_{10} Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	North Salt Lake #2	**Longitude:**	111.921	**Station Type:**	SLAMS
AQS#:	49-035-0012	**Latitude:**	40.8055	**MSA:**	Salt Lake City
Address:	1795 North Warm Springs Road	**Elevation (M):**	1283		
City:	Salt Lake				
County:	Salt Lake				

Site Objective:

This site is established to determine SO_2 concentrations at a site near the petroleum refineries.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Salt Lake, in Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-High Middle Neighborhood
PM_{10}	Manual Gravimetric	Daily	Population Exposure	SLAMS-High Middle Neighborhood
PM_{10}	Manual Gravimetric	1 in 12 days	Precision and accuracy assessment	SLAMS-High Middle Neighborhood
PM_{10} Real time	Instrumental TEOM	Continuous	Air Pollution Index	SLAMS-High Middle Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	6 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	6 meters	Urban
WD Sigma	Elec. EPA method	Continuous	6 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	6 meters	Urban

Site: Ogden #2 **Longitude:** 111.9751 **Station Type:** SLAMS

AQS#: 49-057-0002 **Latitude:** 41.207 **MSA:** Ogden-Clearfield

Address: 228 East 32nd Street **Elevation (M):** 1318

City: Ogden

County: Weber

Site Objective:

This site is established replace the original Ogden site to determine population exposure based on population.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Ogden in Weber County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS-High Neighborhood
$PM_{2.5}$ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS-High Neighborhood
PM_{10}	Manual Gravimetric	Daily	Population Exposure	SLAMS-High Neighborhood
PM_{10} Real time	Instrumental TEOM	Continuous	Air Pollution Index	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Price #2 **Longitude:** -110.7702 **Station Type:** Slams

AQS#: 49-007-1001 **Latitude:** 39.5958 **MSA:** Not in an MSA

Address: 351 South Weasel Run Road **Elevation (M):** 1738

City: Price

County: Carbon

Site Objective:

This site is established in response to an ozone three state study. This site is funded by the Bureau of Land Managment

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

This site is located in a farm field . 3.6 Km East of Price

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Continuous	High winter ozone study	Regional
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	High winter ozone study	Regional

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Regional
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Regional
WD Sigma	Elec. EPA method	Continuous	10 meters	Regional
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Regional

Site:	Rose Park	**Longitude:**	111.9309	**Station Type:**	SLAMS
AQS#:	49-035-3010	**Latitude:**	40.7955	**MSA:**	Salt Lake City
Address:	1354 West Goodwin Avenue	**Elevation (M):**	1298		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:

This site is established to better represent this area of Salt Lake City for $PM_{2.5}$ exposure.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the community of Rose Park at the north end of Salt Lake City, Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
$PM_{2.5}$	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood

Site:	Saltaire	**Longitude:**	112.0497	**Station Type:**	SPM
AQS#:	49-035-3005	**Latitude:**	40.8061	**MSA:**	Salt Lake City
Address:	6640 West 1680 North	**Elevation (M):**	1282		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:
This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:
Yes, all objectives are met.

Site Description:
The site is located west of the Salt Lake Airport in Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. LiCor	Continuous	2 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Santa Clara	**Longitude:**	113.6363	**Station Type:**	SLAMS
AQS#:	49-053-0006	**Latitude:**	37.1291	**MSA:**	St George
Address:	1215 North Lava Flow Drive	**Elevation (M):**	852		
City:	Santa Clara				
County:	Washington				

Site Objective:
This site is established to determine population exposure to ozone in Washington County.

Does the site meet the objective:
Yes, all objectives are met.

Site Description:
The site is located on the grounds of the Snow Canyon Middle School in the city of Santa Clara in Washington County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Instrumental Chemiluminescence	Seasonal	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Spanish Fork	**Longitude:**	111.6603	**Station Type:**	SLAMS
AQS#:	49-049-5010	**Latitude:**	40.1364	**MSA:**	Provo-Orem
Address:	312 West 2050 North	**Elevation (M):**	1395		
City:	Spanish Fork				
County:	Utah				

Site Objective:

This site is established to determine the boundary of the high ozone and $PM_{2.5}$ concentrations in Utah County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Spanish Fork airport in the city of Spanish Fork, Utah County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Transport Regional

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Syracuse	**Longitude:**	112.1185	**Station Type:**	SPM
AQS#:	49-011-6002	**Latitude:**	41.0886	**MSA:**	Ogden-Clearfield
Address:	4700 West 1700 South	**Elevation (M):**	1284		
City:	Syracuse				
County:	Davis				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Syracuse near the causeway to Antelope Island State Park, Davis County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Tooele #3	**Longitude:**	112.2997	**Station Type:**	SLAMS
AQS#:	49-045-0003	**Latitude:**	40.5393	**MSA:**	Salt Lake City
Address:	434 North 50 West	**Elevation (M):**	1513		
City:	Tooele				
County:	Tooele				

Site Objective:

This site is established to determine population exposure to air pollutants.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Tooele, Tooele County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
$PM_{2.5}$ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	3 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Washington Boulevard #2	**Longitude:**	111.9703	**Station Type:**	SLAMS
AQS#:	49-057-0006	**Latitude:**	41.2201	**MSA:**	Ogden-Clearfield
Address:	2540 South Washington Blvd	**Elevation (M):**	1338		
City:	Ogden				
County:	Weber				

Site Objective:

This site is established to monitor ground level, mid-block, mid-sidewalk exposure to carbon monoxide.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in downtown city of Ogden in Weber County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Microscale

Site:	West Jordan	**Longitude:**	112.001	**Station Type:**	SPM
AQS#:	49-035-3004	**Latitude:**	40.6112	**MSA:**	Salt Lake City
Address:	4540 West 8700 South	**Elevation (M):**	1414		
City:	West Jordan				
County:	Salt Lake				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of West Jordan, Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

1.6 NETWORK MODIFICATION PROCESS

Utah's monitoring network is reviewed annually to verify that the objectives of the network are being met. The most recent emissions inventories for each pollutant are reviewed along with population data and ambient data gathered in the area. When it is available, current computer air pollution dispersion modeling is also reviewed. Based on that information, the State may identify the need for an additional monitoring station or the need to relocate a station to better meet the objectives of the site. The State may also identify sites that are no longer needed to meet the monitoring needs of the State. If a change is needed in the monitoring network, a Network Modification Form is submitted to EPA Region 8 prior to or as part of installing, modifying, or removing a monitor.

1.7 REVIEW OF NETWORK MODIFICATIONS IN 2010

Two new monitoring sites were added in response to a three-state study focusing on winter time ozone in the Uinta basin. A site was added in the Fruitland area. This site is sponsored by the Bureau of Land Management. The second site was added in the Price area.

Trace level sulfur dioxide and total oxides of nitrogen (NO_y) monitors were added to the NCore site at Hawthorne.

Real time PM_{10} was added to the Cottonwood site in response to higher than expected filter concentrations. Smoke impact to our sampler was identified as coming from a neighbor's wood stove.

$PM_{2.5}$ sampling was discontinued at the Highland site due to neighbor's trees restricting free airflow, causing the site to not comply with siting requirements.

A saturation study for ozone in the proposed Salt Lake City-Ogden-Clearfield combined statistical area was conducted in the summer of 2010. This study will continue in 2011 to support siting of ozone monitors and to identify the actual non-attainment area for ozone in the new combined statistical area.

An intensive study for $PM_{2.5}$ was completed during the winter 2009-10 and again during the 2010-11 winter period. Sampling and analysis for speciated $PM_{2.5}$ was conducted on an every-other-day schedule at LN, HW, BV and L4 from December to March of each year. Data was enhanced with hourly data of soluable ions and elemental and organic carbon from the Hawthorne site. Data will be used in the State Implementation Plan (SIP) modeling for $PM_{2.5}$.

1.8 PROPOSED NETWORK MODIFICATIONS

With increasing monitoring needs and fiscal constraints, the State determined that it is critical to verify that the monitoring network is operating as efficiently as possible. To meet that goal, each station must be evaluated to determine if the station addresses a critical need without duplicating existing information. To that end, the following criteria have been used to review the Utah air monitoring network.

1. Ensure that the air monitoring network meets the requirements of 40 CFR 58.

2. Identify the monitoring sites that are required to evaluate compliance with the NAAQS and provide public notification of air quality conditions.

3. Provide the technical information needed to support SIP development, including monitoring data for modeling and control strategy selection.

4. Meet the available budget allocations by consolidating monitoring equipment to selected sites and removing monitoring stations that are collecting redundant or immaterial data.

As a result of this review, some modifications to the monitoring network may need to occur in the coming year.

DAQ-Identified Data Needs

The DAQ staff have met to consider how to collect the air monitoring data needed to meet the goals and objectives of DAQ and implement the new EPA monitoring regulations while, at the same time, receiving significantly reducing federal EPA funding for the monitoring program. A number of primary objectives were identified and served as the basis for a major realignment of Utah's monitoring network. Those objectives are:

- Provide timely air quality data to the public to support and enhance DAQ's public notification process whenever unhealthy air quality conditions are forecast or already exist. This notification allows the public to take the appropriate precautions to protect their health while providing them and local industry the opportunity to reduce their emissions and their impact on air pollution.

- Collect air pollution data to evaluate areas against the NAAQS.

- Focus on monitoring air pollutants of current concern. Carbon monoxide and SO_2 are currently considered "solved problems" because it has been many years since concentrations of either pollutant violated an applicable NAAQS. At the same time, EPA has revised the NAAQS for $PM_{2.5}$, NO_2, SO_2, and ozone to lower levels, and retained the NAAQS for CO. CO, NO_2 and SO_2 at levels well below the NAAQS may participate in the formation of ozone and secondary $PM_{2.5}$. The assessment of the role these pollutants play in the formation of secondary pollutants requires measuring them at very low concentrations.

- Collect detailed, continuous, and short-term multi-pollutant data at common sites in each urban area to be used in scientific research, including the support of photochemical computer modeling required for SIP development. $PM_{2.5}$ and ozone are generally formed from the reaction of other pollutants over time under the right meteorological conditions; therefore, multiple hotspot-type monitors are not necessary. The current network has shown that $PM_{2.5}$ and ozone concentrations are generally homogeneous in each of the air sheds with only slight variability; therefore, DAQ is proposing concentrating the monitoring efforts into fewer sites. Selection of those sites was based on how well the site represented the air shed, how long of a historic perspective was available for the site, and how well the site met the monitoring siting criteria for all of the pollutants to be monitored as well as meteorological data collection. This objective parallels EPA's emphasis on NCore monitoring sites.

- Increase the capability of the monitoring network to measure non-criteria or toxic air pollutants.

- Increase the capability of the monitoring network to provide detailed atmospheric information during short-term intensive measurement campaigns and special studies.

- Monitor air quality in areas with significant oil and gas development to determine whether this development is adversely affecting air quality.

- Gather baseline monitoring data in rural Utah to determine if and where air pollution problems may exist.

- Define future nonattainment areas for pollutants based on air quality data rather than geo-political boundaries.

- Consider establishing a new Sandy/Draper site.

- Look at establishing rural ozone monitoring sites.

- Continue an ozone saturation study in the combined statistical area.

- Conduct an ozone saturation study in the Washington County area.

- Locate a lead sampler in the Copperton area.

- Re-establish a monitoring site in the Vernal, Duchesne area.

- Secure monitoring locations for road-side NO_2 and CO monitoring requirements.

Based on the above changes in DAQ data needs and changes in EPA's focus and funding, changes to the Utah air monitoring network are necessary to meet future needs of the

DAQ. Details of those changes will be discussed in the sections discussing individual pollutants.

2.0 UTAH AIR MONITORING NETWORK

The following sections discuss the air monitoring network in Utah for the criteria pollutants identified by EPA that have a National Ambient Air Quality Standard (NAAQS). The need for ambient air monitoring for each criteria pollutant is different. The requirements for selecting an appropriate monitoring site are identified by EPA in 40 CFR 58.

2.1 SULFUR DIOXIDE

The sulfur dioxide (SO_2) monitoring sites were installed at their present locations based on proximity to large SO_2 emission sources; the results of early computer modeling; or in response to concerns expressed by the public.

Monitoring sites were established at Beach and Magna locations in response to emissions from a nearby copper smelter operation. Changes made in the operations and emissions control by the smelter, have reduced the SO_2 emissions by over 99% from those years when violations of the SO_2 NAAQS were monitored. Concentrations at the Beach and Magna monitors are now less than 10% of the NAAQS. On-going compliance activities assure the current level of control will be maintained into the future. Since the last violation of the SO_2 standard occurred in 1978, the need to measure SO_2 around the smelter operation is for support of the State Implementation Plan (SIP).

The Bountiful/Viewmont and North Salt Lake sites are population oriented sites in the area of oil refineries. A violation of the SO_2 NAAQS has never been reported since the start of monitoring SO_2 at the North Salt Lake site in November 1981. As with the copper smelter, compliance activities will assure continued control of the oil refineries. DAQ plans to continue SO_2 monitoring year around at Bountiful/Viewmont and will be able to continue a trend analysis of SO_2 concentrations in North Salt Lake.

Salt Lake County and a portion of Tooele County are still officially designated nonattainment, pending EPA approval of Utah's SO_2 maintenance plan. The SO_2 maintenance plan is based on more than 25 years of continued monitoring showing attainment of the NAAQS. Once the area is redesignated to attainment, at least one monitor will need to be operated in the maintenance area to ensure that the area continues to maintain the standard.

A trace level SO_2 monitor was installed at the Hawthorne consolidated site to ensure that the area continues to maintain the SO_2 standard as well as to comply with the NCore site requirements. Monitoring began late in 2010 and data is not included in the data review charts.

Data Review from the Existing Monitoring Network

The following graph displays the highest and second highest 24-hour values for the monitoring stations. As can be seen, the highest values are much less than the standard.

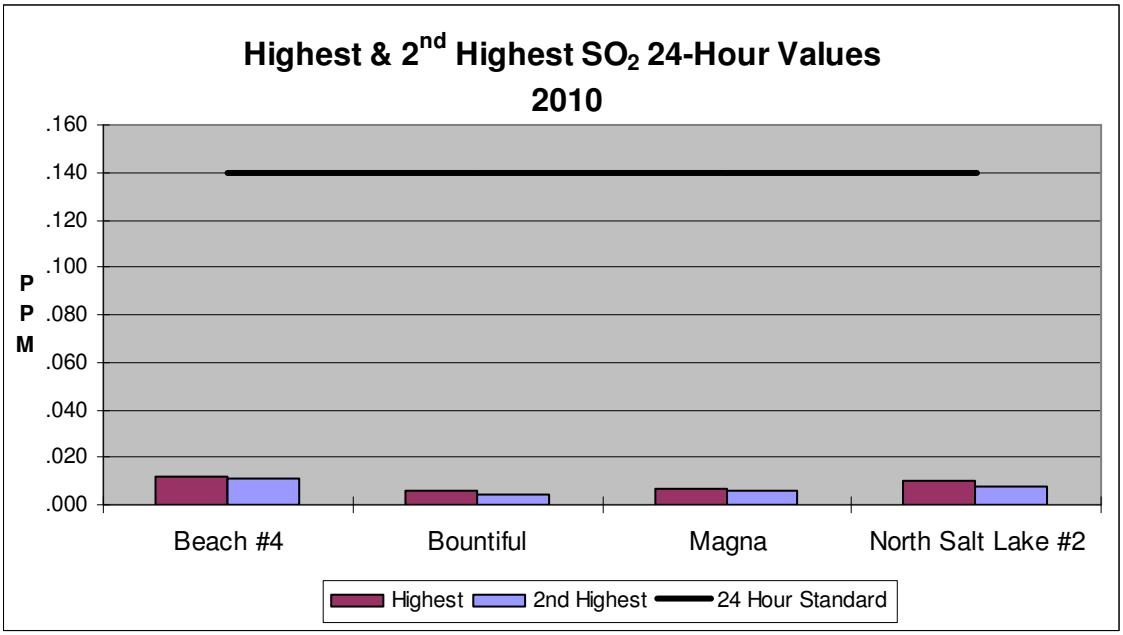

Figure 2

The following graph shows the history of SO_2 concentrations measured in Utah. The last time the standard exceeded the NAAQS was 1981. Since that time, SIP requirements and control measures implemented by industrial operations have resulted in low SO_2 concentrations.

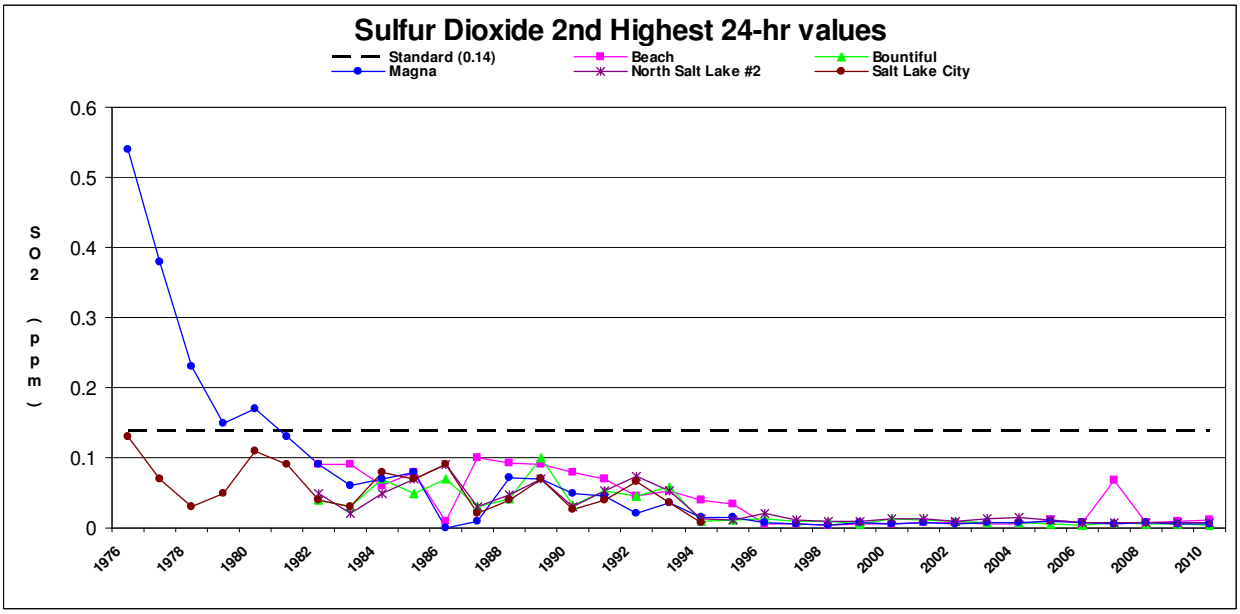

Figure 3

New SO_2 Standard

The U.S. Environmental Protection Agency (EPA) has issued a final new health standard for sulfur dioxide (SO_2). The one-hour health standard will protect millions of Americans from short-term exposure to SO_2, which is primarily emitted from power plants and other industrial facilities. Exposure to SO_2 can aggravate asthma and cause other respiratory difficulties. People with asthma, children, and the elderly are especially vulnerable to the effects of SO_2.

EPA has set the one-hour SO_2 health standard at 75 parts per billion (ppb), a level designed to protect against short-term exposures ranging from five minutes to 24 hours. EPA is revoking the current 24-hour and annual SO_2 health standards because the science indicates that short-term exposures are of greatest concern and the existing standards would not adequately protect public health.

EPA has also changed the monitoring requirements for SO_2. The new requirements assure that monitors will be placed where SO_2 emissions impact populated areas. Any new monitors required by this rule must begin operating no later than Jan. 1, 2013. EPA is expecting to use modeling as well as monitoring to determine compliance with the new standard.

An exceedance will be based on the 99% or 4th highest 1-hour value. By using the new 1-hour standard looking at the last three years' (2008, 2009, and 2010) values, Utah would still meet the new standard at our four SO_2 stations.

The following table shows the values for the last three years.

Evaluation of Utah Monitors for New SO_2 Primary Standard					
Year	**B4**	**BV**	**HW***	**MG**	**N2**
2008	0.038	0.014		0.029	0.057
2009	0.069	0.013		0.028	0.038
2010	0.022	0.01		0.026	0.027
3-Yr Average	**0.043**	**0.012**		**0.028**	**0.041**
Standard	0.075	0.075	0.075	0.075	0.075

Table 2

(*Note: Hawthorne (HW) data set is less than a full year)

Changes to the SO_2 Monitoring Network

The State will continue SO_2 monitoring at Beach, Bountiful, Hawthorne, Magna, and North Salt Lake stations. The new SO_2 standard will not require additional SO_2 monitoring. The Salt Lake, Tooele, Summit Consolidated Base Statistical Area (CBSA) is the only area with required monitoring for the new standard.

Special Studies

No special studies are planned.

2.2 NITROGEN DIOXIDE

The existing Nitrogen Dioxide (NO_2) monitoring stations were installed at their current locations based on a combination of emissions inventories and population centers. EPA's guidance that monitoring should be performed in areas with a population of 200,000 or greater was considered; but monitoring for the NO_2 NAAQS has been a secondary consideration in Utah. The oxides of nitrogen (NO_x) are important precursors in the secondary formation of particulate matter and ozone. These pollutants tend to be more regional in nature rather than occurring directly downwind of major sources of NO_x. For this reason, NO_2 monitoring stations have been co-located with $PM_{2.5}$ and ozone monitors to better understand and model the formation of these pollutants. All NO_2 monitoring sites have consistently measured concentrations well below the NAAQS.

Data Review from the Existing Monitoring Network

The existing NO_2 monitoring stations are: Ogden #2, North Provo, Bountiful, Hawthorne, Logan #4, Cottonwood, Fruitland, Price, and Santa Clara.

The following displays the annual average NO_2 values for the monitoring stations. As can be seen, the highest values are much less than the standard. Price and Fruitland sites are not included as they did not have enough data in 2010 to be representative.

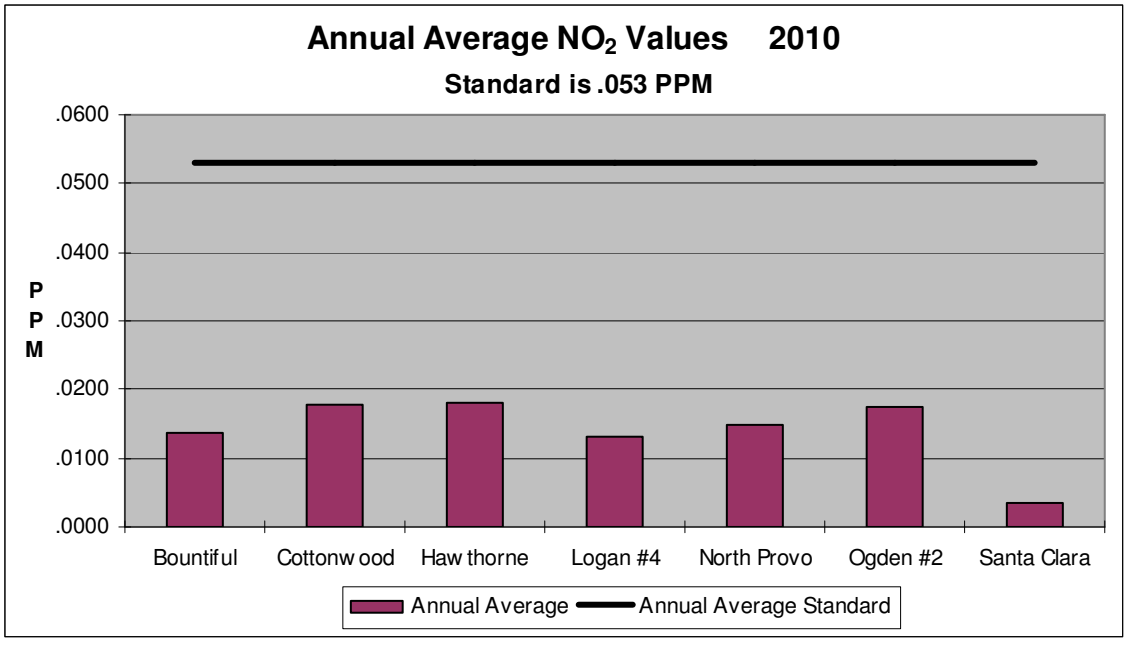

Figure 4

Over the years, NO_2 has not been close to exceeding the standard, as the following graph displays. The concern from NO_2 is its involvement in the creation of ozone and fine particulate matter. Because of that concern, NO_2 controls have been required on vehicles and industry. As a result of those controls, a close review of the graph shows a slight decreasing trend.

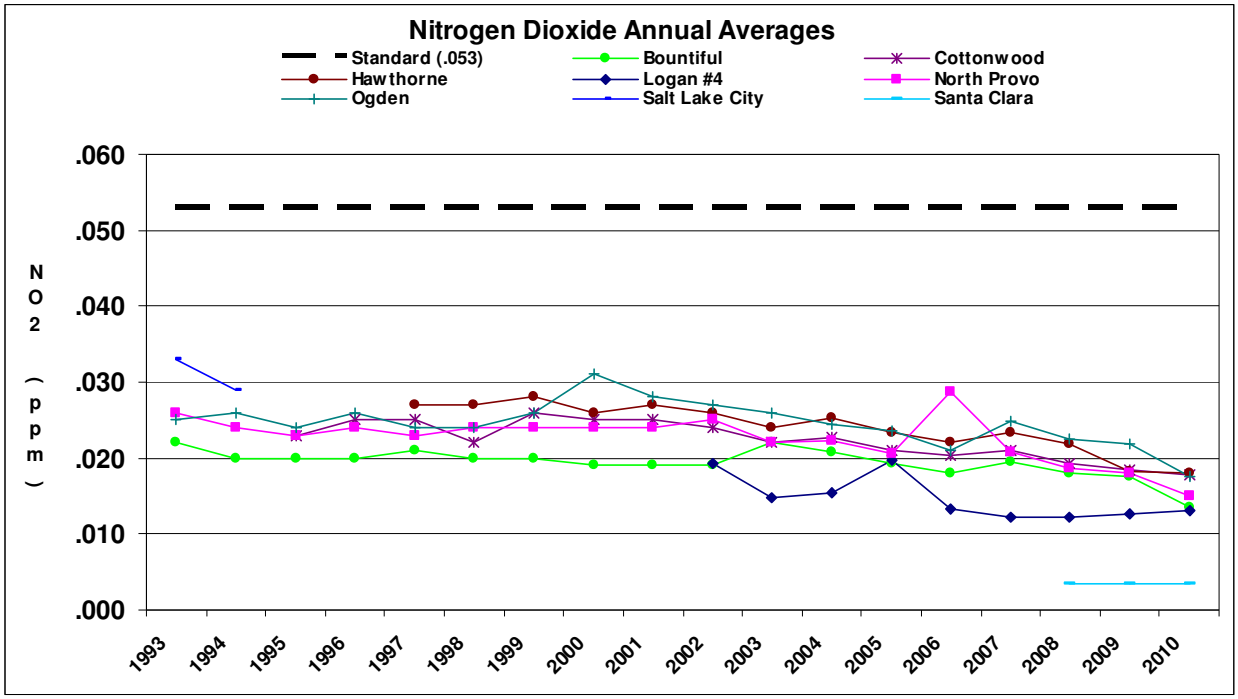

Figure 5

New NO_2 Standard

On January 22, 2010, EPA strengthened the health-based National Ambient Air Quality Standard for nitrogen dioxide (NO_2). The new standard will protect public health, including the health of sensitive populations: people with asthma, children, and the elderly. EPA is setting a new 1-hour NO_2 standard at the level of 100 parts per billion (ppb). This level defines the maximum allowable concentration anywhere in an area. In addition to establishing an averaging time and level, EPA also is setting a new "form" for the standard. The form is the air quality statistic used to determine if an area meets the standard. The form for the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations. EPA also is retaining, with no change the current annual average NO_2 standard of 53 ppb which Utah has never exceeded. Below is a table which shows where Utah stands with the new NO_2 standard for the last four years (2007-2010).

Evaluation of Utah Monitors for New NO_2 Primary Standard										
	Year	BV	CW	HW	L4	NP	O2	SC**	FL*	P2*
Yearly 98% Daily Max 1-Hr NO_2 Concentration	2007	0.072	0.070	0.069	0.046	0.063	0.065			
	2008	0.063	0.063	0.064	0.047	0.057	0.067	0.019		
	2009	0.062	0.059	0.056	0.046	0.056	0.064	0.021		
	2010	0.048	0.062	0.052	0.047	0.051	0.057			
3-Yr Average	2007-2009	0.066	0.064	0.063	0.046	0.059	0.066	0.020#		
	2008-2010	0.058	0.061	0.062	0.047	0.055	0.063			
Standard		**0.100**	**0.100**	**0.100**	**0.100**	**0.100**	**0.100**	**0.100**	**0.100**	**0.100**

Table 3

*(Note: Fruitland (FL) and Price (P2) less than 1 year data in 2010)

**(Note: Santa Clara data for 2010 not yet entered into AQS)

#(Note: Santa Clara 2007-2009 is two year average)

Changes to the NO_2 Monitoring Network

EPA has proposed revisions to the NO_2 NAAQS. Included in the proposed revisions is a new EPA requirement for near-road monitoring in any urban area with a population greater than or equal to 350,000 people. UDAQ has identified three areas that will require near road monitors. Trace level NO_y monitoring at the Hawthorne NCore site began in the fourth quarter of 2010.

In response to high ozone concentrations reported in the Uinta Basin, DAQ, with support and cooperation from the BLM, has installed NO_2 monitors at Fruitland and Price. These two sites are measuring NO_2 as a precursor for ozone formation.

Special Studies

DAQ is participating in a three-state study for ozone and precursor NO_2 concentrations in the Uintah basin.

Near-Road NO_2 Monitoring

Near-road monitoring sites were selected for the Utah county MSA, the Salt Lake-Davis MSA, and the Ogden-Clearfield MSA. Sites were selected based on traffic volume, contribution of heavy truck traffic and accessibility to the maximum traffic areas without sound barrier walls. Monitoring is required starting in January of 2013.

Total Oxides of Nitrogen (NO_y) Monitoring

NO_y instrumentation was added to the NCORE suite of instruments in 2010. The NO_y analysis is different from the NO2 data in that NO_y includes compounds other than NO and

NO_2. Compounds that are included in NO_y include nitrous acid, nitric acid, ammonia, and other nitrogen bearing compounds in the gaseous form. Another difference from the NO2 analysis is the air for the NO_y is sampled at 10 meter above the ground as opposed to 2 meters for the NO_2. Limited data is available for the year 2010.

2.3 CARBON MONOXIDE

On January 28, 2011, EPA proposed to retain the existing NAAQS for Carbon Monoxide (CO). EPA has concluded the existing standards provide the required level of public health protection, including protection for people with existing health problems associated with exposure to CO in the ambient air. EPA has retained the standards of 9 ppm measured over 8 hours and 35 ppm measured over 1 hour periods. EPA has proposed monitoring near highly trafficked roads within 53 urban areas as part of the overall CO monitoring networks.

Historically, elevated CO concentrations occurred near high traffic areas. Therefore, traffic information was obtained from the Utah Department of Transportation and the two local Municipal Planning Organizations (Wasatch Front Regional Council for Salt Lake, Davis and Weber Counties and Mountainlands Association of Governments for Utah County) to establish CO monitoring sites based on traffic patterns and densities. Two saturation studies were conducted to support the representativeness of our monitoring site locations

At the time the monitors were first installed in the 1970's, violations of the CO NAAQS were routinely recorded in Ogden, Provo, and Salt Lake City. The State developed and implemented State Implementation Plans and Maintenance Plans for those three areas that were subsequently approved by EPA. The implementation of those plans has resulted in all three areas attaining the CO NAAQS and being redesignated as attainment areas. In addition to the control measures identified in the plans, increasing federal controls on automobiles have significantly lowered emissions, resulting in monitored ambient concentrations of CO that are presently significantly below the NAAQS.

The existing CO monitoring stations that operate all year are: Hawthorne, Cottonwood, North Provo, Ogden #2, and Washington Blvd #2 (downtown Ogden site). CO monitoring began at the Ogden #2 site in December 2007. The intent is to evaluate the CO data from Washington Blvd #2 and Ogden #2. If the data shows one site can represent the area, Utah proposes to close the single site station (Washington Blvd #2) and have the Ogden #2 site continue as the long term trend site for Weber County.

Data Review from the Existing Monitoring Network

The following graph displays the highest and second highest 8-hour values for the monitoring stations. As can be seen, the highest values are much less than the standard.

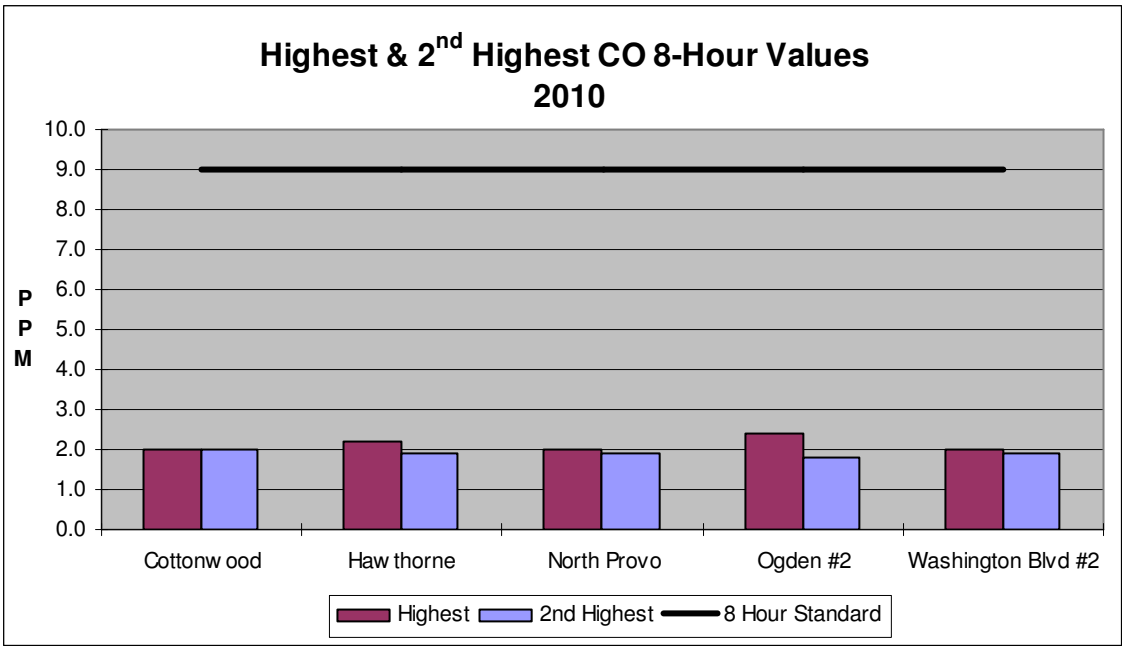

Figure 6

The following graph shows the trend in the second highest CO concentrations from 1993 through 2010. The decrease in CO levels is a result of the controls that are required on new vehicles, the impact of the county vehicle inspection and maintenance programs, and controls on industry.

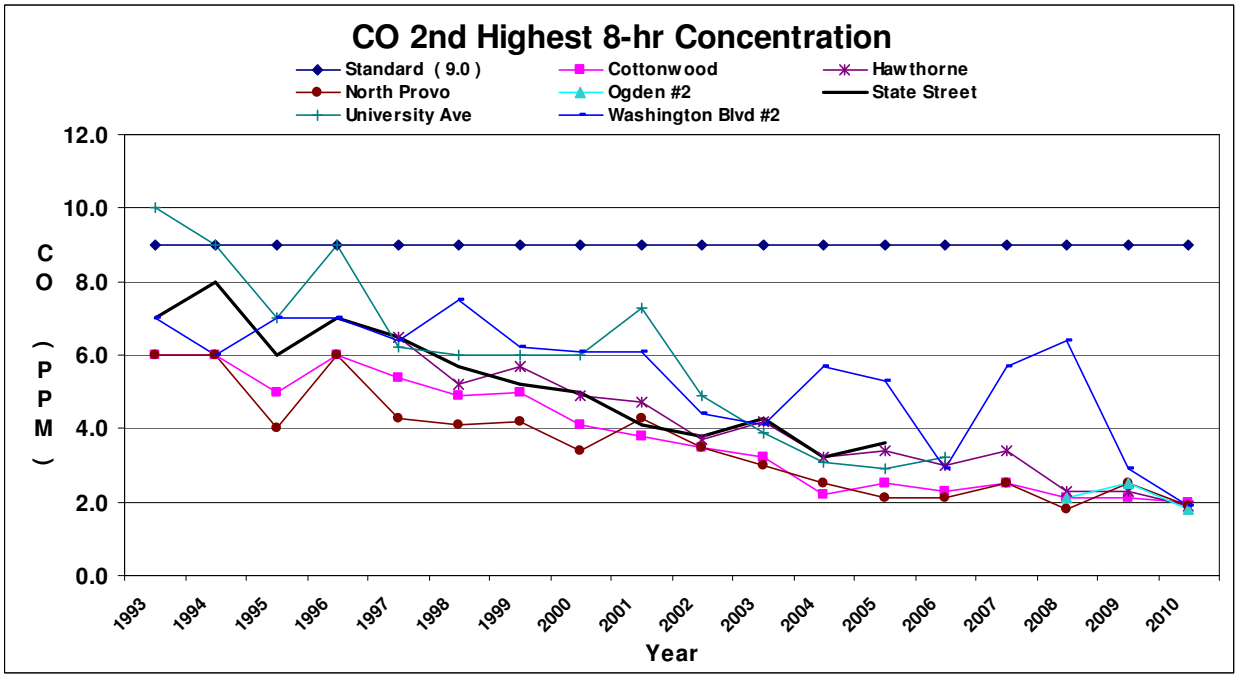

Figure 7

Additional Monitoring

No new monitoring is planned for demonstration of compliance to the NAAQS. Near-road monitoring as part of the changes to the monitoring networks will require one new site.

Changes to the CO Monitoring Network

The State of Utah DAQ will continue to monitor CO at North Provo, Cottonwood, Ogden #2, and Washington Blvd #2 sites. The NCore trace level CO monitor will continue to support health affects studies and fulfill NCore requirements. As required in the proposed CO monitoring network near-road monitoring rule, DAQ will include CO monitoring at the Salt Lake, Tooele, Summit CBSA near-road NO_2 monitoring site. Monitoring will begin January 2013.

Special Studies

No special studies are planned.

2.4 OZONE

Unlike carbon monoxide, SO_2 and NO_2 ozone are generally not emitted directly into the atmosphere in quantities high enough to result in a violation of the NAAQS. It is produced in the atmosphere from precursor compounds. Nitrogen oxides, hydrocarbons, and CO react in the presence of sunlight to form a number of photochemical compounds. The photochemical reaction takes time to occur; therefore, ozone monitoring should be conducted down wind from the sources of precursors.

The valley setting of the major urban areas along the Wasatch Front complicates ozone monitoring. Typically, peak ozone stations should be located five to seven hours downwind from an urban area. However, summer wind patterns along the Wasatch Front result in a diurnal up-valley/down-valley wind flow pattern, such that after five to seven hours, the polluted air mass may be right back over the urban area. Ozone concentrations generally fluctuate seasonally with higher values measured only during the warm months. Ozone is also created during winter temperature inversions as part of the complex photochemical reaction that is also creating $PM_{2.5}$. Therefore, some of the DAQ ozone monitors are operated seasonally, while others are operated year-round.

The existing ozone monitoring sites are located where the highest hourly and 8-hour ozone concentrations are expected to occur, located primarily in the populated counties along the Wasatch Front. Many of the sites routinely observe exceedances of the old 8-hour ozone NAAQS and the new 8-hour ozone NAAQS. Analysis of data from rural areas throughout Utah and the bordering states indicates that ozone is potentially much more of a regional problem in the Western United States than was originally thought.

Data from monitors in the Uinta Basin have reported ozone concentrations during the winter that can be significantly higher than our typical summer concentrations. The monitoring sites are operated by Golder Associates as part of the mitigation of a fine from EPA. The sites are located at Ouray and Redwash south of Vernal on EPA/ Bureau of Indian affairs (BIA) land. Since the high ozone levels were recorded on EPA/BIA lands,

the DAQ has limited authority to respond to these high ozone concentrations. High ozone levels seem to be associated with snow covered ground and strong surface temperature inversions throughout Duchesne and Uintah counties. DAQ participated in the Uintah Basin Air Monitoring (UBAM) study with Utah State University to determine the extent of the high ozone areas. Preliminary data indicates the high ozone concentrations extend throughout the lower Uintah Basin when snow is covering the ground and temperature inversion conditions are present. Wyoming has reported similar ozone concentrations in the Pinedale anticline area for the past three years. Utah DAQ is participating along with the Bureau of Land Management, Wyoming DAQ, and Colorado DAQ in a three-state study to better understand wintertime ozone formation. In support of the three-state study, DAQ, with cooperation and support from BLM, has added two monitoring sites, one in Fruitland and one in Price

Data Review from the Existing Network

The following graph displays the highest and fourth highest 8-hour values for the monitoring stations.

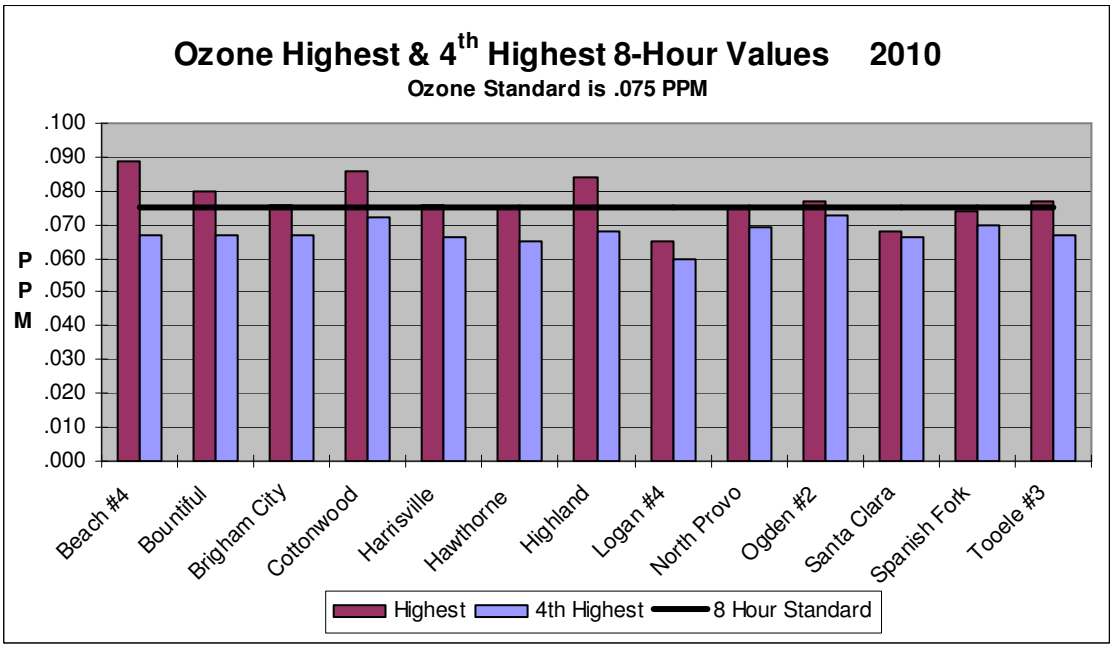

Figure 8

The following graph shows the trend of the 4th highest 8-hour average concentrations of ozone through 2010 for all of the monitoring sites. To comply with the standard, the rolling average of the 4th highest 8-hr ozone average over a three-year period should not exceed 75 parts per billion. A review of the ozone data for 1995-2010 shows that even though several stations came very close in 2009 and 2010, there was no exceedance of the new yearly ozone standard of 0.075 ppm.

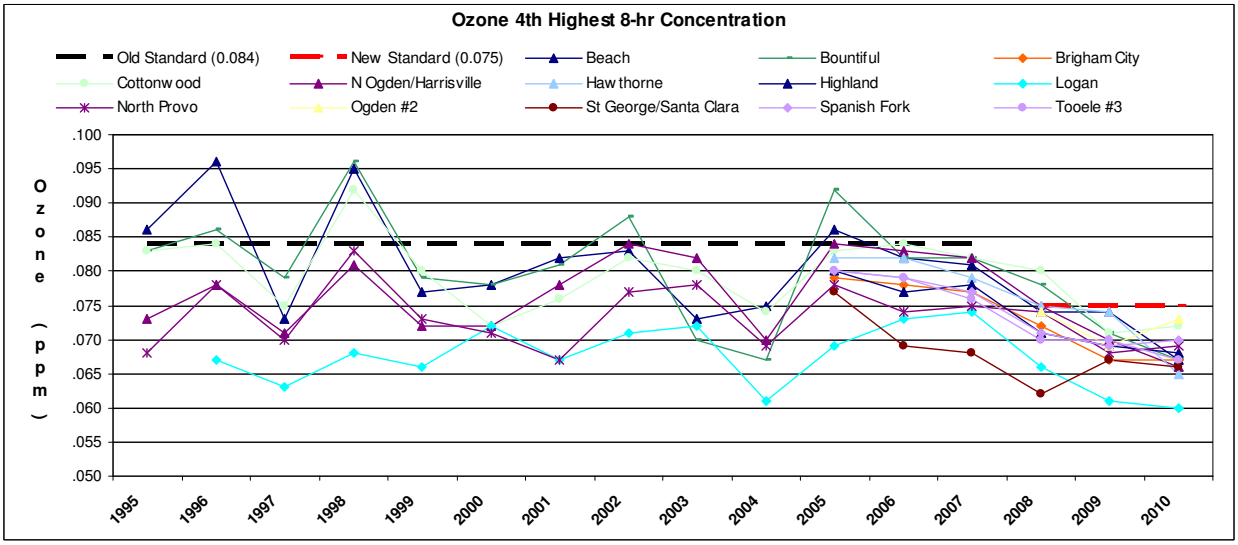

Figure 9

The following graph shows the trend for the rolling 3-year average of the 4th highest 8-hour average ozone concentration for 1995 through 2010. Ozone concentrations have declined slightly over the past three years despite significant population growth. This is due to emission control devices on new vehicles, the county-operated vehicle emission inspection and maintenance programs, a requirement for Stage I vapor controls at gasoline dispensing facilities, and significant control measures installed by industrial sources.

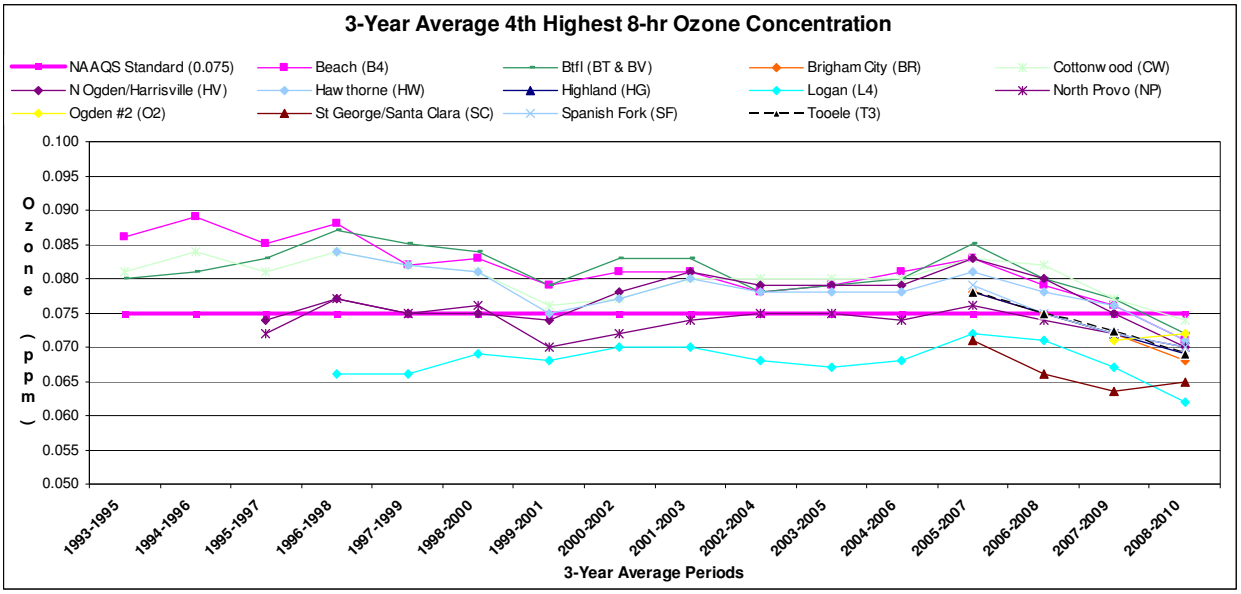

Figure 10

Additional Monitoring

DAQ is participating in a three-state study of winter ozone formation.

Analysis of years of monitoring data has shown that the polluted air mass moves around the valley, analogous to water sloshing around in a bathtub. At any given time, the ozone

concentrations at some sites may be higher than others in the network. DAQ currently operates four ozone monitors in the Salt Lake / Davis County Maintenance Area. It has been our experience that the Cottonwood and Bountiful monitors usually record the highest ozone concentrations in the airshed. The Hawthorne site will be the Salt Lake County consolidated monitoring site. The Beach monitor, located at the edge of the Great Salt Lake where no people live, at times shows elevated ozone concentrations, although it is not a location to which a significant portion of the population may be exposed. The Beach Monitor will continue as an intermittent maximum ozone site. DAQ is planning to locate additional ozone monitors in the southern part of Salt Lake Valley as resources allow.

Ozone monitoring will continue at Beach #4, Brigham City, Bountiful, Cottonwood, Harrisville, Hawthorne, Highland, Logan #4, North Provo, Ogden #2, Santa Clara, Spanish Fork, and Tooele #3. Utah is planning to locate monitors in the southern part of the valley as resources allow. Additional ozone monitoring sites may be established to respond to growth or to supplement the information regarding regional ozone concentrations.

Special Studies

A number of portable ozone monitors will be placed along the western border of the state, as well as the eastern side of Salt Lake and southern border of Utah Valley to monitor ozone transferred into the state and urban areas from Nevada and rural areas. This study will help determine the influence of ozone transported into Utah and help in planning for further ozone reduction strategies. This study effort will continue in 2011.

A special study will be conducted in the St. George, Washington County area to characterize distribution of ozone in the area. EPA has questioned the placement of the ozone monitor in Santa Clara as representing the highest ozone area. Portable monitors will be located at the border of Utah and Nevada to address the potential ozone coming from the Las Vegas/Los Angeles area as well as throughout Washington County to address the suitability of the Santa Clara monitoring site.

2.5 PM_{10}

The samplers for PM_{10} (particulate matter 10 microns and smaller in aerodynamic diameter) were initially installed at the same sites as the Total Suspended Particulate (TSP) samplers because computer modeling was not available to assist in locating the sites. TSP monitoring had been performed for many years at those locations and showed many violations of the TSP standard. TSP is considered particulate matter approximately 40 microns and smaller in aerodynamic diameter.

PM_{10} monitoring is complicated by the fact that there are two types of PM_{10} particles. Primary particles are released from the source as particles and their concentration decreases from the point of release dependent on dispersion characteristics. Secondary particles are released as gases and become PM_{10} particles through chemical reactions in the atmosphere. Concentrations of secondary particles can be greater some distance from the source or after some time has elapsed from the time of release to allow the reactions

to occur. Monitored PM_{10} concentrations are a combination of both primary and secondary particles. Establishing monitoring sites to measure both types of particles can be a concern. Historically, TSP and, therefore, PM_{10} sites were located based on emissions of primary particulates.

Data Review from the Existing Monitoring Network

The following graph displays the highest and second highest 24-hour values for the monitoring stations.

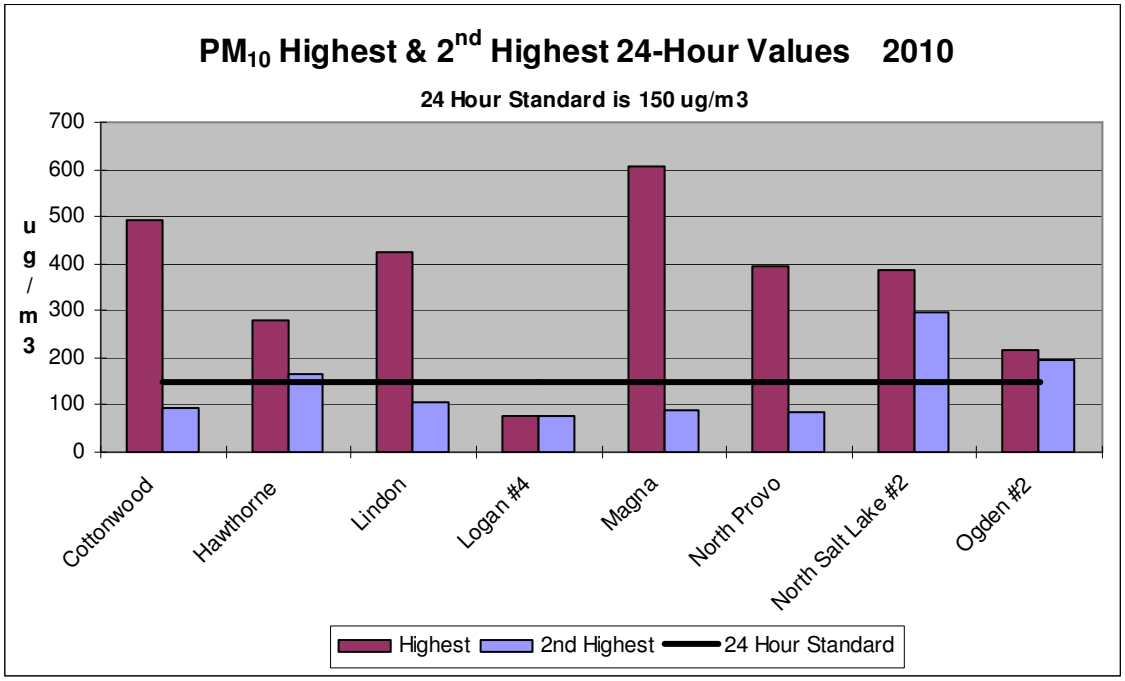

Figure 11

Figures 12 and 13 show the PM_{10} trends from 1990 through 2010. Although the PM_{10} concentrations stayed mostly below the NAAQS threshold through 2005, an increasing trend is observed starting 2006. These violations are attributed to high wind gust episodes in the Utah and Salt Lake valleys and resulted in exceptionally high PM_{10} readings.

An example of the high wind blown dust was experienced in Salt Lake and Utah counties April 17 to 21 2008. Wind gusts reached 48 miles per hour and PM_{10} concentrations reached 693 ug/m3 for the one-hour average. March 30, 2010 was a day of sustained high winds and PM_{10} concentrations reached the highest concentrations recorded by DAQ with hourly values greater than 1000ug/m3. High particulate concentrations were recorded from Utah County to Weber County. Figure 12 shows all data, including the wind blown events while figure 13 shows the data with the exceptional events removed. It is DAQ's position that EPA should concur that the high particulate matter dust events were not controllable by DAQ.

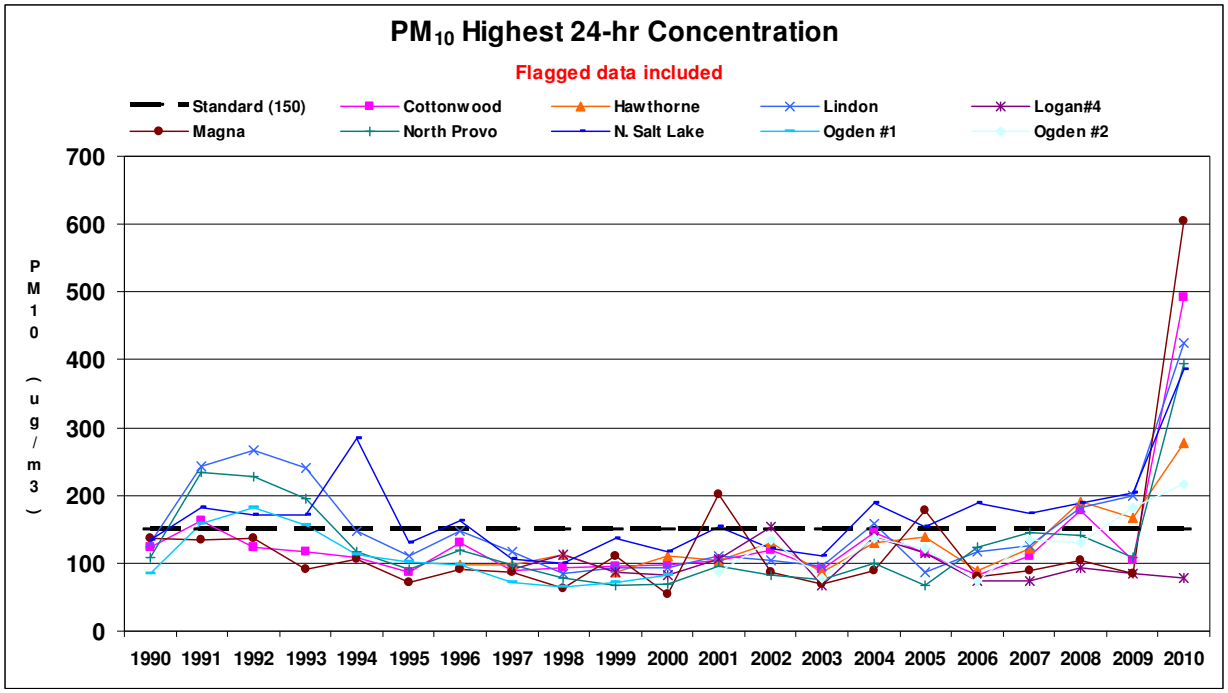

Figure 12

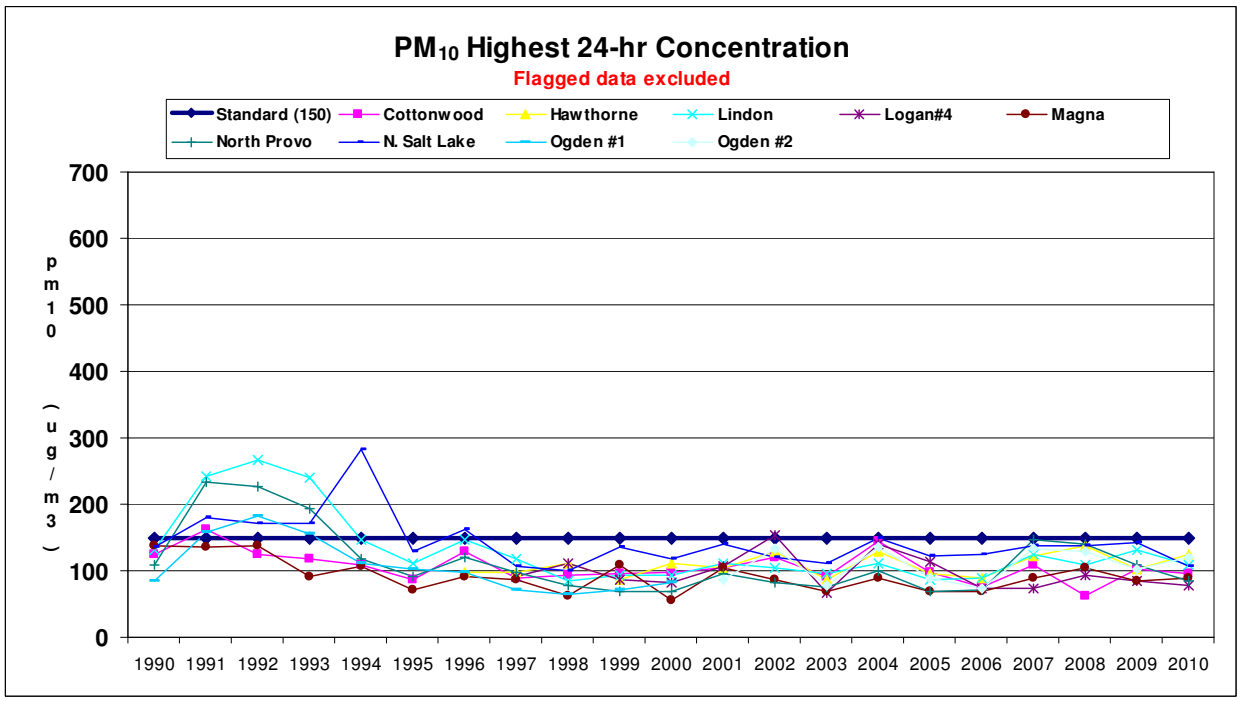

Figure 13

Additional Monitoring

No additional PM_{10} monitoring is necessary at this time.

Special Studies

No special studies are planned for the next year.

Changes to the PM_{10} Monitoring Network

No changes to the PM_{10} monitoring network are planned for 2010.

2.6 $PM_{2.5}$

On September 20, 2006, the EPA promulgated a new NAAQS for particulate matter measured as $PM_{2.5}$, or particulate matter 2.5 microns and smaller in aerodynamic diameter. The promulgation changed the 24-hour standard from 65 ug/m3 to 35 ug/m3, effective December 18, 2006. The more stringent standard increased the importance of $PM_{2.5}$ sampling.

$PM_{2.5}$ is comprised of two different types of particles. Primary $PM_{2.5}$ particles are released from the source as particles and their concentration decreases from the point of release, dependent on dispersion characteristics. Secondary particles are released as gases and become $PM_{2.5}$ particles through chemical reactions in the atmosphere. Measured $PM_{2.5}$ concentrations are a combination of both primary and secondary particles.

In Utah, elevated $PM_{2.5}$ concentrations principally occur during the winter time when the ground is covered in snow and strong cold inversions set up along the Wasatch Front, resulting in stagnant air and foggy conditions. During these times, nearly all of the monitored $PM_{2.5}$ is secondary particulate. DAQ has operated many monitors along the Wasatch Front and participated in studies in the Cache Valley. DAQ has found that $PM_{2.5}$ concentrations are generally fairly homogeneous throughout the valleys during the winter inversions.

In the summer, strong wind events may cause elevated concentrations of $PM_{2.5}$, most of which is primary particulate (wind-blown dust). Smoke from prescribed and wild land fires can influence the PM concentrations.

Particulate sampling was first conducted for TSP, then PM_{10} at several locations in each county. Previous particulate monitoring has shown that the existing locations have elevated particulate concentrations. In addition, computer modeling for TSP and PM_{10}, along with some limited PM_{10} saturation sampling also showed existing particulate sampling sites are located in the areas of high concentrations for particulates. Therefore, when the initial $PM_{2.5}$ monitors were set up, it was done at those historic sites. $PM_{2.5}$ remains suspended in the air much longer than larger size particulates. Concentrations between sites can show the same levels of material due to the lower settling times

Historically, TSP and PM_{10} sites were located based on emissions of primary particulates, and the $PM_{2.5}$ monitoring sites were located based on concentrations of PM_{10}. The appropriateness of that decision will be reviewed as modeling for $PM_{2.5}$ is performed. To complete the modeling, emission inventory information must be collected and the reactive models need to be verified; however, our finding thus far of the homogeneity of $PM_{2.5}$ concentrations throughout the air shed indicates that one or two $PM_{2.5}$ monitors in each air shed are adequate to demonstrate compliance with the NAAQS. $PM_{2.5}$ monitors that sample every three days are of limited value because continuous hourly data are

needed for public notification and modeling. DAQ is developing a more robust PM $_{2.5}$ network by going to a near real time network, with enough data to be helpful in modeling.

Data Review from the Existing Monitoring Network

The following graph displays the highest and 98% highest 24-hour values for the monitoring stations.

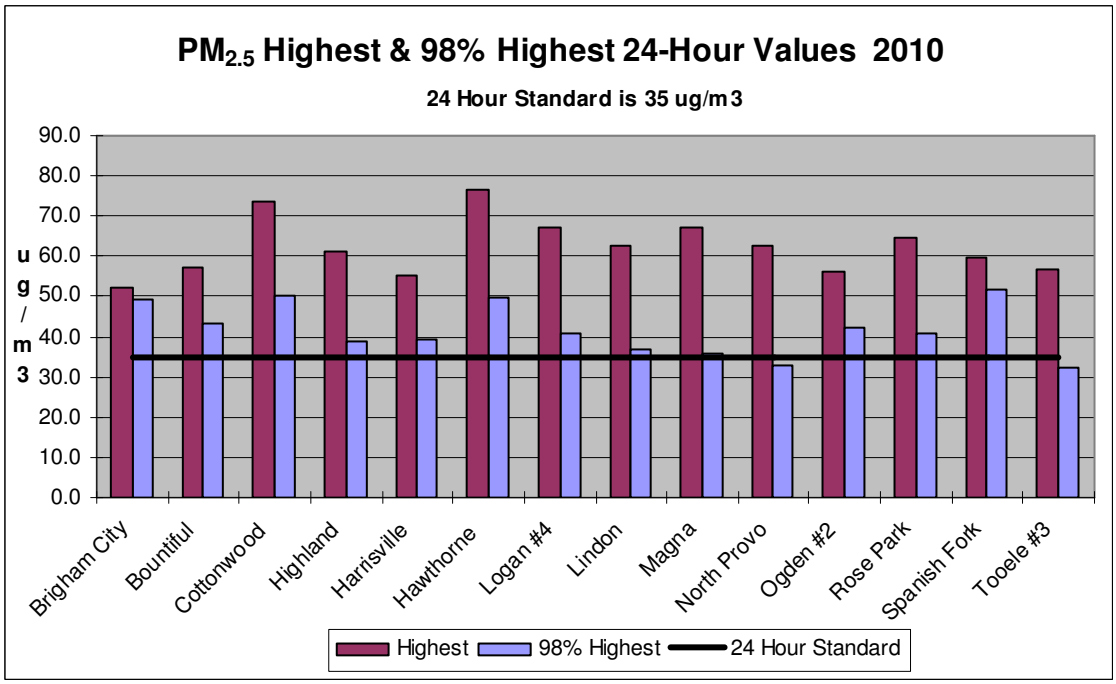

Figure 14

The following graph shows the historical trend of 3-year rolling average of the PM$_{2.5}$ 98th percentile concentrations measured in Utah. Although average PM$_{2.5}$ concentrations have generally shown a steady decline over the last decade, data collected at many of our monitoring sites have shown violations the new 35 ug/m^3 standard.

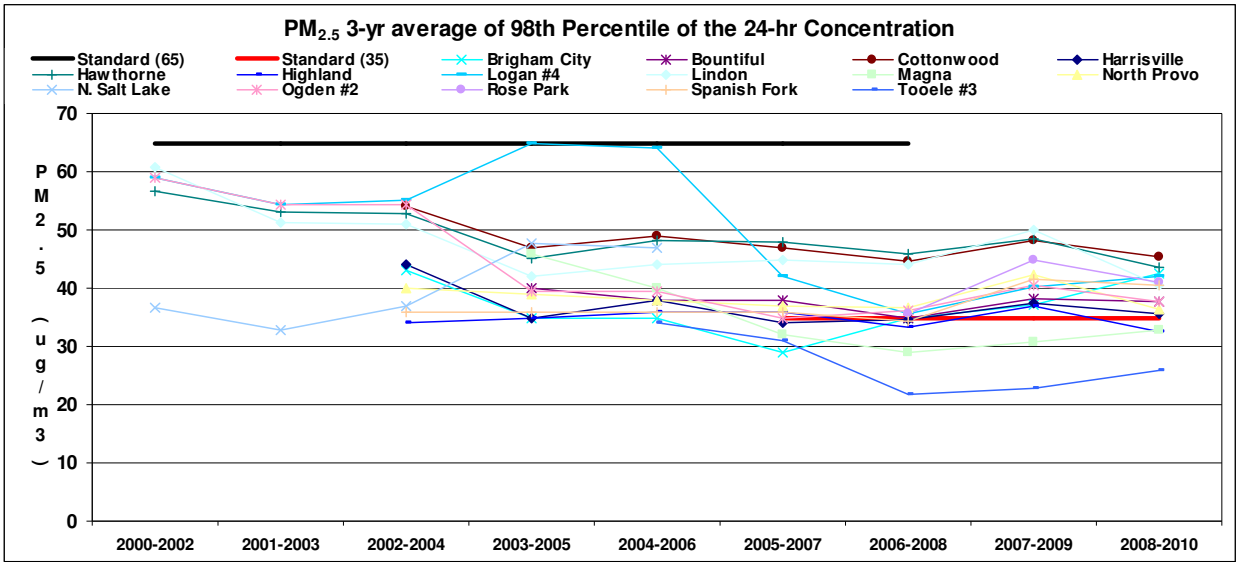

Figure 15

Additional Studies

No special $PM_{2.5}$ studies are planned for this next year.

Changes to the $PM_{2.5}$ Monitoring Network

Real-time monitors have recently received EPA equivalence designation. Real-time data is useful for modeling $PM_{2.5}$ concentrations. To support real-time notification to the public, Utah proposes the addition of real-time monitors at selected sites.

EPA has considered monitoring for PM_{coarse} which is the PM material between $PM_{2.5}$ and PM_{10}. The Federal courts have determined that NAAQS for PM_{10} and $PM_{2.5}$ presents double jeopardy since both include the smaller particulate fractions. If the regulation requiring monitoring of PM_{coarse} is published in the Federal Register, Utah will incorporate that into the PM monitoring plan. DAQ is in a position to generate PM_{coarse} data, since the requirements for the manual collection of that data is currently met by subtraction of $PM_{2.5}$ filter based concentrations from PM_{10} filter concentrations. PM_{coarse} is presently required at NCore sites and is monitored at our NCore site by a real time method.

No changes to the $PM_{2.5}$ network are planned for 2010.

2.6.1 $PM_{2.5}$ Speciation

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 SLAMS $PM_{2.5}$ speciation sites that operate on an every-sixth-day sampling schedule. Samples 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. 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. Samples are returned to the EPA contract laboratory as soon as possible after sampling packed with ice substitutes to retain the volatile compounds sampled. Individual samples are distributed to separate laboratories dependant on the specific compounds of interest. Data undergo level one and two review and data checks by the contract laboratory. The data are then submitted to the state for level 3 review and concurrence. The data are submitted to the AIRS database by the contractor. 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. The speciated samples have been useful in identifying impacts from wild fire and residential wood burning smoke and holiday firework events. Data have also been used to identify the contribution of soils during high wind events.

Figure 16 shows the contribution of the identified compounds from the speciation sampler during a winter atmospheric inversion period. Figure 17 shows the contribution of identified compounds from the speciation sampler during a clear winter period.

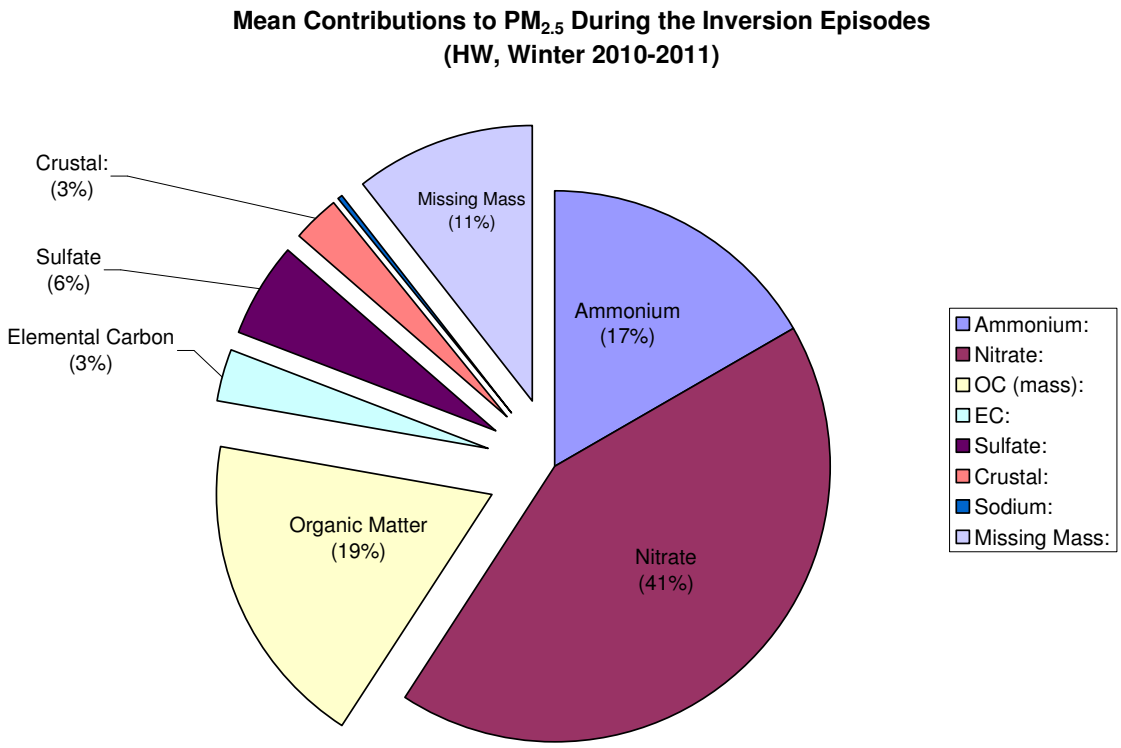

Figure 16
Average concentration 37.4 ug/m^3 n = 11

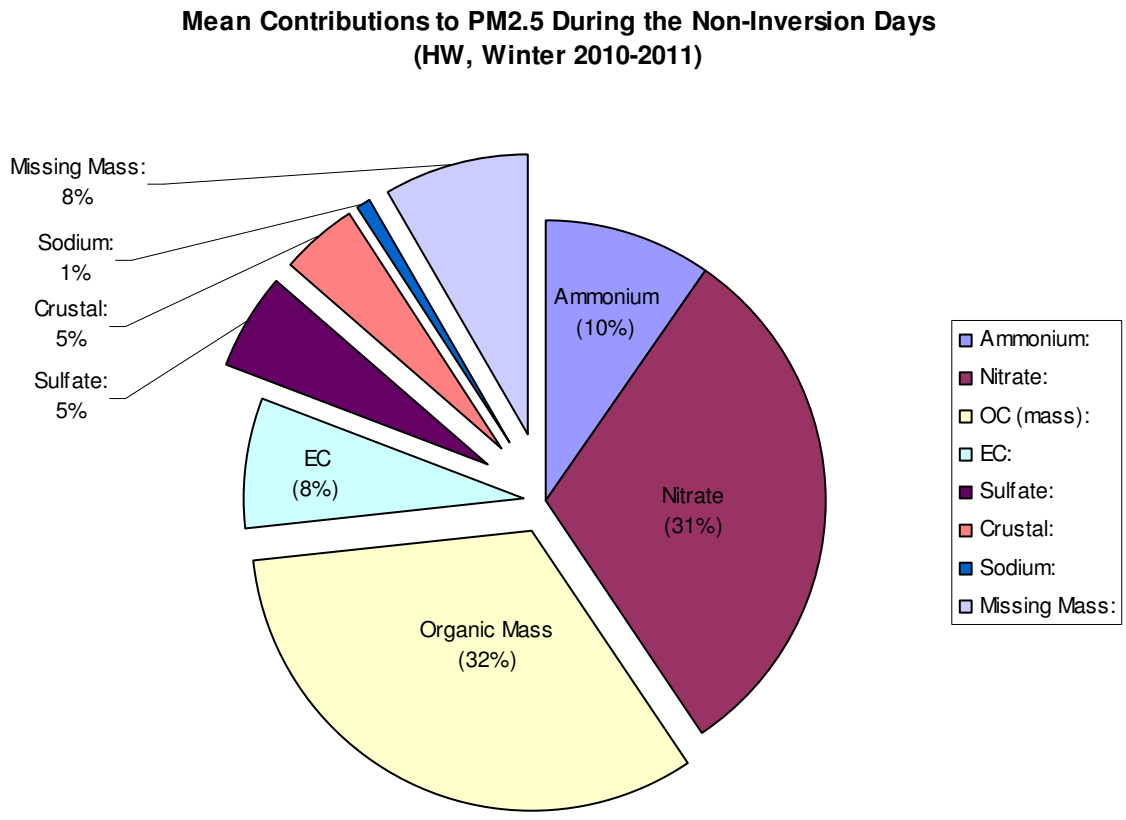

Figure 17
Average concentration 10.2 ug/m^3 n = 23

2.7 TOTAL SUSPENDED PARTICULATE, LEAD

Starting in 2009, DAQ began operating a particulate lead (Pb) sampler at the Magna site. Source-oriented, year-round lead (Pb) samplers were installed at Magna sampling site to monitor ambient air to comply with the new federal regulations for Pb monitoring. The high-volume sampler operates on a one-in-six day basis, with a co-located sampler running every twelve days. Figure 18 is a graphical representation of the 2010 data.

Fifty-six samples were collected and analyzed for lead in 2010. The average 24 hour concentration was 0.017 ug/m^3, the maximum concentration measured was 0.112ug/m^3. The maximum three month rolling average was 0.06ug/m^3. The lead NAAQS level is set at 0.15ug/m^3 over a 3 month rolling average. Our maximum 3 month monitored concentration is 40% of the standard. Late in 2010, DAQ discovered a problem with quality assurance checks which could lead to invalidation of the year's data. The data have been entered into the AQS database, but with a qualifier flag indicating the QA problem. The error may have caused an increase of at most 12% in our measured concentrations of lead, bringing the maximum rolling average to 0.067ug/m^3 or 45% of the NAAQS. DAQ feels the data may have merit and should be reported in AQS with the appropriate flag. Staff has worked with the instrument manufacturer, resulting in changes to the operation and QA procedures of the sampler. DAQ fully expects the lead data collected in the future will meet all quality assurance requirements.

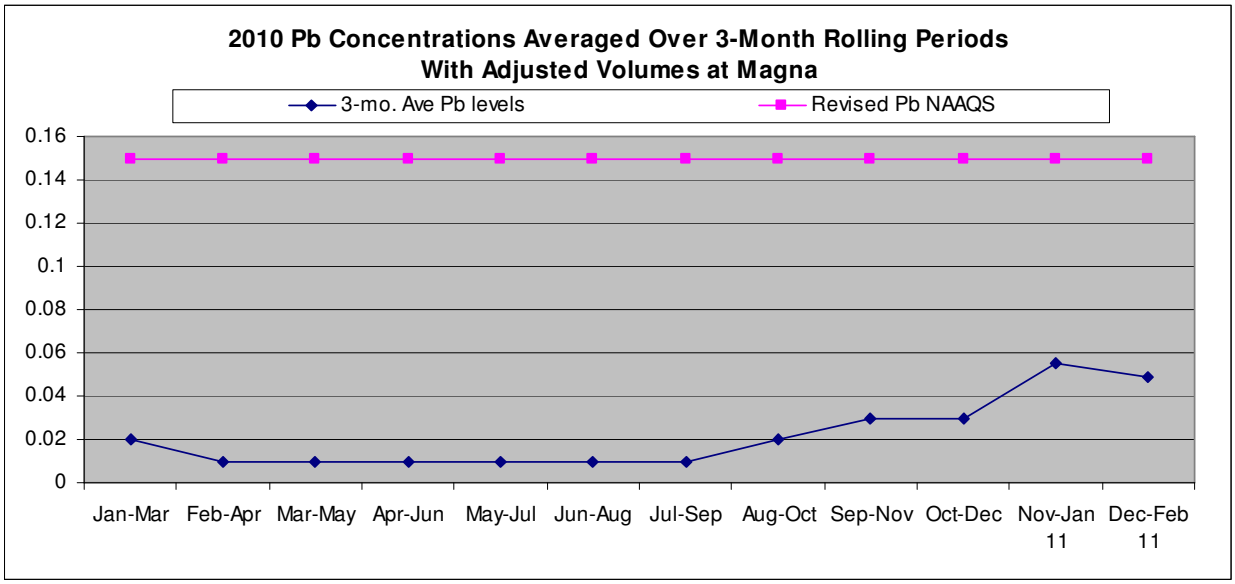

Figure 18

Additional Monitoring

On December 30, 2009, EPA proposed to lower the emission threshold from 1.0 tons per year (tpy) to 0.50 tpy. The lower threshold limit causes the Kennecott Copper Corporation concentrator unit near Copperton to be included in the areas with required lead monitoring. To meet this change, a site will be located in the area indicated by modeling to have the highest lead contribution from the concentrator unit.

Special Studies

No special studies are planned for the next year.

Changes To The Lead (Pb) Monitoring Network

A monitoring site in the Copperton area will be added.

2.8 METEOROLOGICAL DATA

By measuring surface wind speed and direction, one can attempt to determine where a pollutant-laden air mass has come from and where it is going. This information is essential any time an attempt is made to determine the cause of high pollution periods. The wind patterns in the mountainous terrain of Utah can be very difficult to analyze. Winds affected by geographical features can and often do control air mass movement in the mountain valleys where most industrial and urban activities are concentrated.

Because of these complex wind patterns, it has been the policy of the DAQ that many major air monitoring stations of middle scale or larger should record meteorological data. Each station must be evaluated separately because of the complex micrometeorology in Utah. Because the terrain produces complex wind patterns, it is difficult to collect enough monitoring data to adequately represent the meteorology within the air shed.

There is a need to collect Solar Radiation/Delta T (SRDT) data for use in computer modeling. Delta T is the differential temperature at 2 and 10 meters and shows the stability of the air mass that is being modeled. Sources outside the Wasatch Front will be required to collect SRDT data as part of any PSD permitting actions. However, in non-attainment areas such as along the Wasatch Front where PSD permitting is not required, it may be necessary for DAQ to begin to collect SRDT data, based on available funding.

Existing Monitoring

The current meteorological monitoring network is described in the monitoring site discussions of this plan.

Additional Monitoring

The importance of measuring meteorological parameters has increased as a result of more complex computer modeling. Modifications to the meteorological monitoring network have occurred as a result of a report prepared by the DAQ Technical Analysis Section. DAQ will be using the CMAQ computer model to analyze $PM_{2.5}$ and ozone data. CMAQ requires an extensive amount of meteorological information.

Changes To The Meteorological Monitoring Network

No changes to the meteorological monitoring network are planned for 2010.

2.9 AIR TOXICS

The Clean Air Act of 1990 identified 189 toxic air pollutants which became the focus of the toxic monitoring program. That list has since been modified to 187 Toxic Air Pollutants. EPA has chosen to focus on 33 toxic air pollutants in its Integrated Urban Air Toxics Strategy. The pressure to increase monitoring for toxic air pollutants has been increased by the National Monitoring Policy. In response, EPA is reducing the number of criteria pollutant monitors required by regulation, allowing states to refocus the cost savings toward additional toxics monitoring. Any increase in the toxic monitoring network will depend on additional funding by EPA.

Mercury as an air toxic is of significant interest in Utah. Advisories to limit the consumption of fish from certain lakes and water sheds have been issued because of the mercury content of the fish flesh. The sediment of the Great Salt Lake has mercury to an extent that has raised concern about its origin. DAQ became part of the National Mercury Deposition Network and began monitoring for mercury in the ambient air in May of 2007.

Sampling Locations

Monitoring near specific sources is being performed based on identified need. Historic sampling has been performed at the Salt Lake City, Lindon, and North Provo stations. DAQ has been part of the EPA-funded Urban Air Toxics Monitoring Program since a site was installed at West Valley in October 1999, where VOCs, aldehydes and particulate metals were sampled.

In January 2003, the air toxics monitoring was moved to the Bountiful monitoring station so Urban Air Toxics equipment would be co-located with the $PM_{2.5}$ speciation equipment. This will provide for a more complete evaluation of the air mass being monitored. Using EPA funds, an aethalometer has been added to the Bountiful site to measure ambient carbon particles. In addition, sampling for hexavalent chromium (Cr^{VI}) was initiated in 2005. A new carbon sampler began operation in 2007. Figure 19 shows the last calculation of Bountiful toxics data compared to cancer and non-cancer risks summaries. The data from 2007 is shown because the more current raw data would not be readily comparable without reference to national standards.

Abbreviations used in figure 19:

NATTS; National Air Toxics Trend Site
NATA; National-scale Air Toxics Assessment
UATMP; Utah Ait Toxics Monitoring Program
HQ; Hazard Quotient
RfC; Reference Concentration
URE; Unit risk estimate

	Cancer URE (µg/m3)	Noncancer RfC (mg/m3)	1999 NATA			2007 NATTS/UATMP		
			Modeled Concentration (µg/m3)	Cancer Risk (ina-million)	Noncancer Risk (HQ)	Annual Average[1] (µg/m3)	Cancer Risk Approximation (in-a-million)	Noncancer Risk Approximation (HQ)
Bountiful, Utah (BTUT) -Census Tract ID 49011126600								
Acetaldehyde	0.000002	0.009	1.13	2.52	0.12	2.24 ± 0.54	4.47	0.25
Acrolein	--	0.00002	0.08	--	4.04	0.59 ± 0.09	--	29.35
Acrylonitrile	0.000068	0.002	<0.01	0.05	<0.01	0.04 ± 0.01	2.46	0.02
Arsenic (PM_{10})	0.0043	0.00003	<0.01	1.22	0.01	<0.01 ± <0.01	4.55	0.04
Benzene	0.000007	0.03	1.52	11.87	0.05	1.29 ± 0.23	9.04	0.04
1,3-Butadiene	0.00003	0.002	0.11	3.37	0.05	0.10 ± 0.03	3.13	0.05
Cadmium (PM_{10})	0.0018	0.00002	<0.01	0.1 1	<0.01	<0.01 ± <0.01	0.51	0.01
Carbon Tetrachloride	0.000015	0.04	0.21	3.15	0.01	0.55 ± 0.03	8.30	0.01
***p*-Dichlorobenzene**	0.000011	0.8	0.03	0.36	<0.01	0.22 ± 0.14	2.42	<0.01
1,2-Dichloroethane	0.000026	2.4	0.03	0.71	<0.01	0.04 ± <0.01	1.10	<0.01
Formaldehyde	5.5E-09	0.0098	1.23	0.01	0.12	3.48 ± 0.83	0.02	0.36
Hexavalent Chromium	0.012	0.0001	<0.01	0.68	<0.01	<0.01 ± <0.01	0.37	<0.01
Manganese (PM_{10})	--	0.00005	<0.01	--	0.01	0.01 ± <0.01	--	0.20
Nickel (PM_{10})	0.00016	0.000065	<0.01	0.05	<0.01	<0.01 ± <0.01	0.31	0.03
1,1,2,2-Tetrachloroethane	0.000058	--	0.04	2.40	--	0.05 ± <0.01	3.15	--
Tetrachloroethylene	0.000005	0.27	0.11	0.68	<0.01	0.32 ± 0.15	1.61	<0.01
Toluene	--	0.4	3.25	--	0.01	5.34 ± 3.45	--	0.01

Exerpts from: 2007 National Monitoring Programs (UATMP and NATTS) Volume I: Main Content

Figure 19

The wet Mercury Deposition Network sampler is located on the roof of the Air Monitoring Center (AMC) in the western Salt Lake City suburb of West Valley City. Monitoring for mercury began in May 2007. Figure 20 shows the valid data for the wet deposition site.

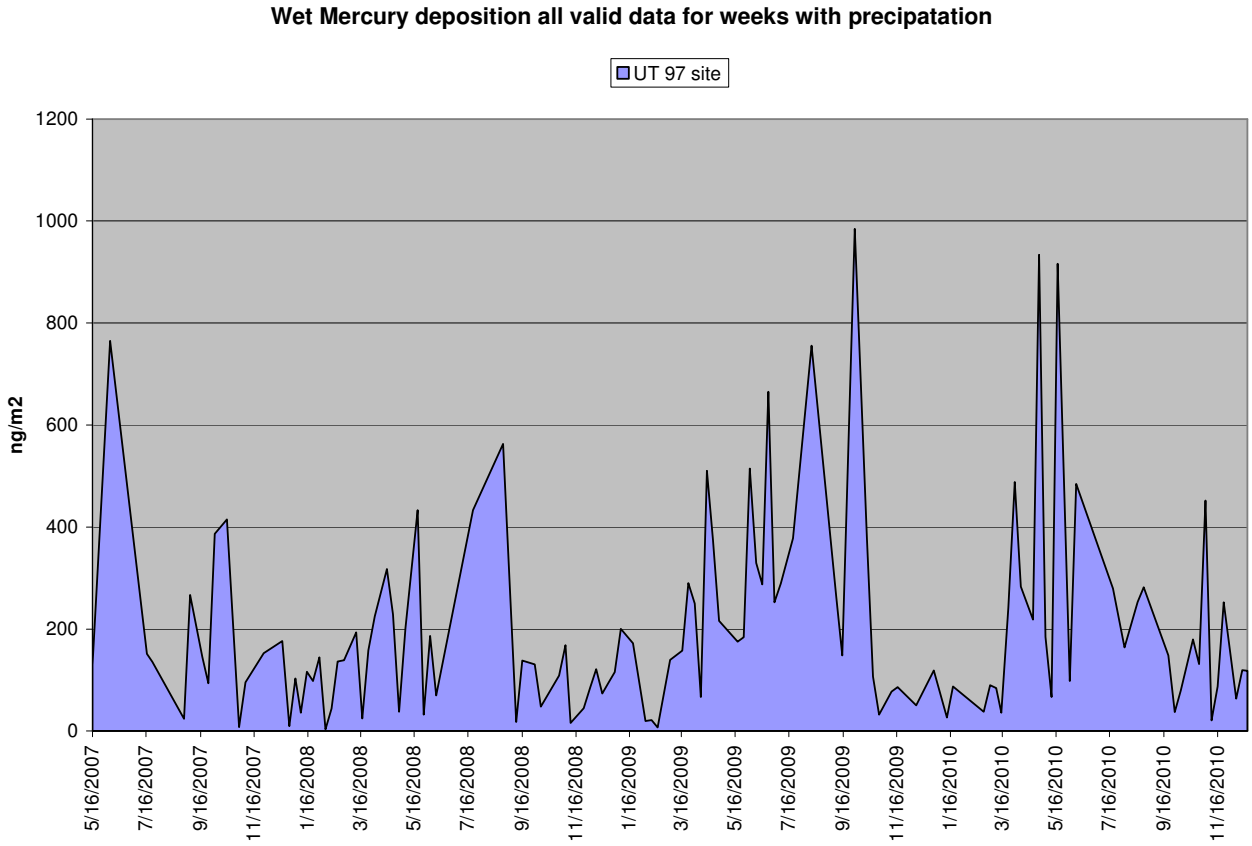

Figure 20

Gaseous (GEM), particulate-bound (PBHg) and reactive (GOM) mercury is also monitored at the AMC site. Figure 21 shows the gaseous mercury data. Meteorological monitoring to support mercury deposition is monitored at this site. Additional monitoring for leaf wetness is included in the suite of instrumentation. Dry deposition mercury monitoring began in 2009.

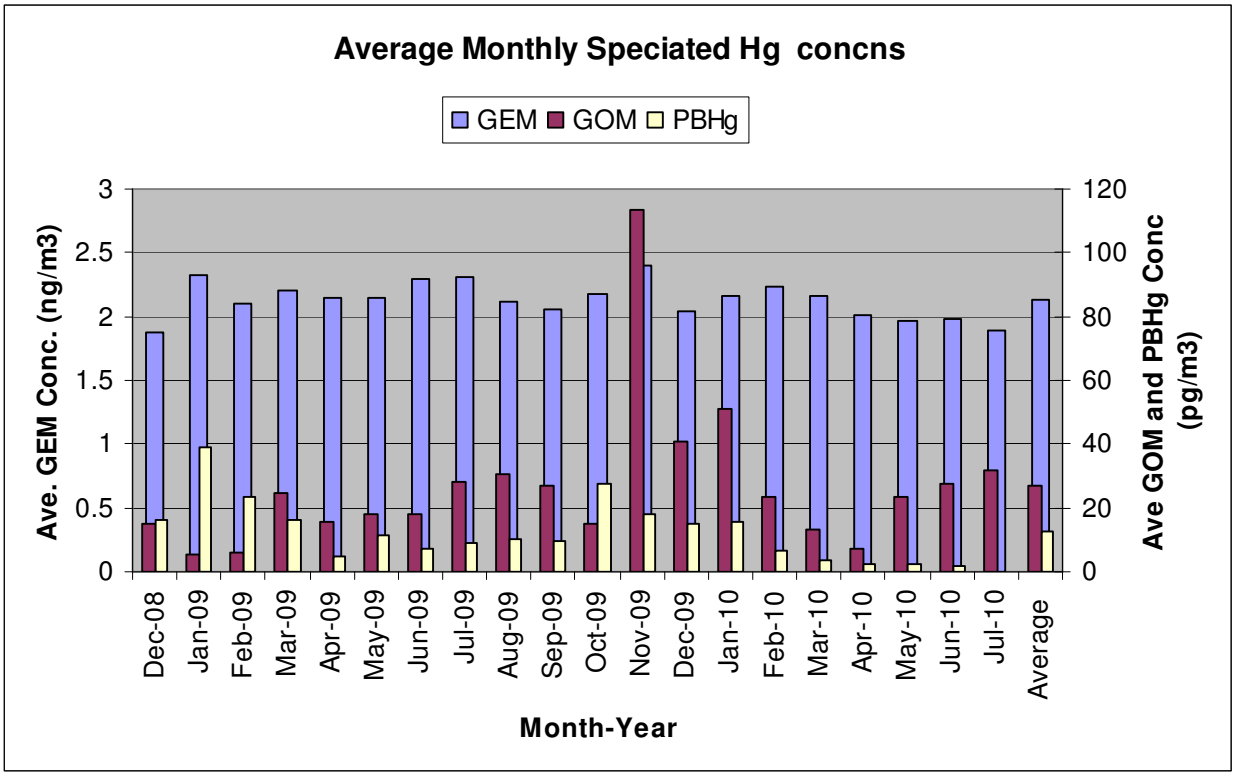

Figure 21

Existing monitoring

The one Urban Air Toxics monitoring site provides a baseline for air toxics data in the urban areas along the Wasatch Front.

Additional Monitoring

EPA has indicated a desire to increase monitoring for non-criteria pollutants. As more guidance comes from EPA and appropriate funding identified, that information will be used to assess needed changes in air toxics monitoring.

Additional Studies

No additional studies are planned for next year.

Changes to the Air Toxics Monitoring Network

EPA's National Monitoring Policy recommends increasing the number of sites and number of parameters being measured as part of identifying toxic air pollutants in the urban areas. As regulations are promulgated that implement the National Monitoring Policy, DAQ will identify needed changes to the toxics monitoring network.

3.0 EMERGENCY EPISODE MONITORING

One of the responsibilities of the Division is to assure that the public is protected from air pollution concentrations that will cause immediate damage or impact on their health. Rule R307-105 establishes emergency response criteria in accordance with Subpart H and Appendix L of 40 CFR 51. Whenever air pollution concentrations meet or exceed the Alert, Warning, or Emergency levels, an Emergency Episode is determined to exist and actions are taken to reduce the emissions of air pollutants. It is the responsibility of the monitoring section to collect the air pollution data used to determine when an Emergency Episode exists. The data collection telemetry system is alarmed and the monitoring staff is alerted whenever the Alert, Warning, or Emergency levels are approached. The monitoring staff has the primary responsibility to notify the director of the division that an emergency episode exists. This is a critical function that is required by State and Federal law. The telemetered stations along the Wasatch Front are included in the Emergency Episode network. The Emergency Episode Plan has been reviewed to allow it to remain current.

No changes have been identified in the emergency episode monitoring effort.

The Air Monitoring Center retains equipment that can be deployed for emergency situations. UDAQ works with the incident commanders, as requested, for air monitoring activities including providing data from existing monitoring sites.

4.0 NETWORK MODIFICATION FORMS

Network modification forms will be prepared for submittal to EPA Region 8 to implement the network modifications identified in this network plan.

5.0 SUMMARY AND CONCLUSIONS

The monitoring requirements identified by federal regulation are currently being met with the existing monitoring network in Utah. The procedures that are being used and the instruments that are being operated meet the standards that have been established by EPA.

A.0 APPENDIX A: NCore Site at Hawthorne Station

The Hawthorne Elementary school site was modified to meet siting criteria as the NCore site for Utah. Two 16 ft shelters were placed as far away from the trees in neighboring yards as could be arranged with the school district. Monitoring for NO_y, trace level SO_2, trace level CO, real time PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, and $PM_{2.5}$ speciation began in the fourth quarter of 2010. In addition, filter-based PM_{10}, filter-based $PM_{2.5}$, NO_2, and real-time Organic Carbon/Elemental Carbon (EC/OC) are monitored. Intensive monitoring periods for secondary particulates and non-methane hydrocarbon (NMHC) can be monitored at this site. The site has a full complement of meteorological equipment as detailed in the site description form.

All the required paperwork and recommendations have been submitted to EPA to designate Hawthorne as Utah's NCore site. Utah has been assured by EPA that the modifications completed to the site will result in approval by EPA.

B.0 APPENDIX B- PUBLIC COMMENTS ON MONITORING PLAN

The comments received during the public review of the monitoring plan will be evaluated and the plan will be modified if determined to be appropriate. Send comments to: Utah Department of Environmental Quality, Division of Air Quality, Attn: R. Neal Olson, PO Box 144820, Salt Lake City, UT 84114-4820