

UTAH

2012 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 2011. 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 2012 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, 2012 to July 1, 2012. 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 and latitude/longitude), objective, spatial scale represented by each site, the parameter(s) monitored/sampled, sampling/analysis method, frequency of data collection, other non-criteria pollutant parameters monitored, and other site specific parameters. 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, source impact (Source), highest expected concentration (High), or background concentration (Background).

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.

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.

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.

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):	1284		
City:	Magna				
County:	Salt Lake				

Site Objective:

This site is established to determine SO₂ concentrations from the 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):	1309		
City:	Bountiful				
County:	Davis				

Site Objective:

The Bountiful Viewmont site is established to determine public exposure to air pollution. The site also monitors 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 PM_{2.5} 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 PM2.5 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:

No. The site no longer meets site requirements. Trees have grown tall enough to block wind direction.

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 a three state ozone study. This site is funded by and operated for 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:

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

Meteorological parameters:

	Sampling &	Operating	Tower	Spatial
Parameter	Analysis Method	Schedule	Height	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): 1331	
City: Harrisville		
County: Weber		

Site Objective:

This site is established in response to an ozone saturation study indicating this as a potentially 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:

	Sampling &	Operating	Monitoring	Spatial
Parameter	Analysis Method	Schedule	Objective	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

Meteorological parameters:

	Sampling &	Operating	Tower	Spatial
Parameter	Analysis Method	Schedule	Height	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): 1306	
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 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
NOY trace level	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
SO2 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:

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:

No. The site no longer meets site requirements. Trees have grown tall enough to block wind direction.

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): 1402	
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):	1380		
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):	1317		
City:	Magna				
County:	Salt Lake				

Site Objective:

This site is established to determine SO₂, particulate matter, and lead (Pb) concentrations from the 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
AQS#: 49-049-0002
Address: 1355 North 200 West
City: Provo
County: Utah

Longitude: 111.6633
Latitude: 40.2538
Elevation (M): 1402

Station Type: SLAMS
MSA: Provo-Orem

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 at north end of the City of Provo, Utah County. It is located on the grounds of the Dale Rex Army National Guard 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):	1286		
City:	Salt Lake				
County:	Salt Lake				

Site Objective:

This site is established to determine SO₂ concentrations 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
AQS#: 49-057-0002
Address: 228 East 32nd Street
City: Ogden
County: Weber

Longitude: 111.9751
Latitude: 41.207
Elevation (M): 1316

Station Type: SLAMS
MSA: Ogden-Clearfield

Site Objective:

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

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#: 49-007-1003	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 a three state ozone 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. 3.6 Km east of Price

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

Gas/Particulate parameters:

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

Meteorological parameters:

	Sampling &	Operating	Tower	Spatial
Parameter	Analysis Method	Schedule	Height	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: Roosevelt	Longitude: 110 0.541	Station Type: SLAMS
AQS#: 49-013-0002	Latitude: 40 17.650	MSA: Not in MSA
Address: S 1000 West West 290 South	Elevation (M): 1588	
City: Roosevelt		
County: Duchesne		

Site Objective:

This site is established to determine maximum ozone and PM_{2.5} concentrations in Duchesne 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	High ozone winter study	Regional
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	
PM ₁₀	Manual Gravimetric	1 in 3 days	Population Exposure	
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	High ozone winter study	
Organic & Elemental Carbon	Instrumental Gas Chromatography	Continuous	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Real time	Instrumental MetOne BAMM	Continuous	Population Exposure	SLAMS- Population Neighborhood
NOY trace level	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-Population Neighborhood
SO2	Pulsed fluorescence	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
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Sonic Method	Continuous	10 meters	Urban
Wind Direction	Sonic Method	Continuous	10 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban

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):	1295		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:

This site is established to better define PM_{2.5} exposure in this area of Salt Lake City.

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

Parameter	Sampling & Analysis Method	Gas/Particulate parameters:		
		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:	Saltair	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.

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):	823		
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): 1380	
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.

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):	1511		
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: Vernal
AQS#: 49-047-1003
Address: 6200 South 45000 West
City: Vernal
County: Uintah

Longitude: 109.509647
Latitude: 40.452310
Elevation (M): 1603

Station Type: Slams
MSA: Not in an MSA

Site Objective:

This site is established in response to an ozone study.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

This site is located in a farm field adjacent to 1000 East.

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

Gas/Particulate parameters:

	Sampling &	Operating	Monitoring	Spatial
Parameter	Analysis Method	Schedule	Objective	Scale
Ozone	Instrumental Ultra Violet	Continuous	High winter ozone study	Regional
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	High winter ozone study	Regional
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

	Sampling &	Operating	Tower	Spatial
Parameter	Analysis Method	Schedule	Height	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:	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):	1316		
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 downtown 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- High Microscale

Site: West Jordan	Longitude: 112.001	Station Type: SPM
AQS#: 49-035-3009	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.

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

1.3 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 core urban area of 50,000 or more population 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 on 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. Metropolitan Statistical Areas in Utah.

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. Monitoring for the criteria pollutants identified by EPA is to be performed using EPA reference or equivalent samplers or analyzers. 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.

One site has been added for 2012, Roosevelt. Modifications to the Hawthorne NCore and Air Monitoring Center sites have been identified. The Cottonwood and Highland sites have been removed because they no longer meet site requirements due to adjacent trees causing free airflow restrictions

Table 1. Utah Air Monitoring Station Locations.

<u>SITE CODE</u>	<u>STATIONS</u>	<u>CITY</u>	<u>COUNTY</u>	<u>ADDRESS</u>
AMC	Air Monitoring Center	Salt Lake	Salt Lake	2861 W Parkway Blvd.
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 Dr.
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
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 32 nd Street
P2	Price	Price	Carbon	351 South Weasel Run Road
RP	Rose Park	Salt Lake City	Salt Lake	1354 West Goodwin Ave
RS	Roosevelt	Roosevelt	Duchesne	S 1000 West W 290 South
SA	Saltair	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
VL	Vernal	Vernal	Uintah	220 South 1000 East
W2	Washington Blvd #2	Ogden	Weber	2540 South Washington Blvd
WJ	West Jordan	West Jordan	Salt Lake	4540 West 8700 South

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 2011

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 Vernal area. The second site was added in the Roosevelt area.

PM_{2.5} and ozone sampling were discontinued at the Cottonwood site due to adjacent trees restricting free airflow causing the site to not comply with siting requirements.

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

Two saturation studies for ozone were conducted in the summer of 2011. One study was conducted to determine ozone non-attainment boundaries in areas adjacent to the Wasatch Front. Data from this study is being used to determine the effect of the Great Salt Lake on ozone formation.

The second sampling program was conducted in Washington County to determine the location of highest ozone and understand the effect of regional transport of ozone on Washington County.

An intensive study period for PM_{2.5} was completed for the 2010-11 winter and again for the 2011-12 winter period. Sampling and analysis for speciated PM_{2.5} was conducted on an every-other-day schedule at LN, HW, BV and L4 for the 2010-11 season and at Logan (L4) for the 2011-12 period. The sampling period was from December to March in 2011 and December 2011 to February 2012. Data was enhanced with hourly data of soluble 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 or SIP's, 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 Pb (lead) are currently considered "solved problems" because it has been many years since these pollutants violated their respective NAAQS. EPA has revised the NAAQS for PM_{2.5}, NO₂, SO₂, Pb, and ozone to lower levels, and retained the NAAQS for CO and NO₂. 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 geopolitical boundaries.
- Establish a new Sandy/Draper site and/or a South/West Jordan site. The southern end of the valley has increased in commercial buildings and population during the last several years. Computer modeling shows a need to provide additional data points in order to evaluate the photochemical model. Monitoring in the south end of the Salt Lake valley will also be useful as a result of the removal of the Cottonwood monitoring site.
- Look at establishing rural ozone monitoring sites.
- Continue an ozone study in the combined statistical area.
- Secure monitoring locations for road-side NO₂, CO monitoring requirements.

Based on the above changes in DAQ data needs and changes in EPA's focus and funding, the following changes to the Utah air monitoring network are necessary to meet future needs of the DAQ. Details of these 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 (SO₂) monitoring sites were installed at their present locations based on proximity to large SO₂ emission sources; the results of early computer modeling; or in response to concerns expressed by the public.

Monitoring sites were established at the 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 SO₂ emissions by over 99% from those years when violations of the SO₂ 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 SO₂ standard occurred in 1978, the need to measure SO₂ 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 SO₂ NAAQS has never been reported since the start of monitoring SO₂ 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 SO₂ monitoring year around at Bountiful/Viewmont and will be able to continue a trend analysis of SO₂ 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 SO₂ maintenance plan. The SO₂ maintenance plan is based on more than 25 years of continued monitoring, showing attainment of the NAAQS. Once the area is re-designated 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 SO₂ monitor was installed at the Hawthorne consolidated site to ensure that the area continues to maintain the SO₂ 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 U.S. Environmental Protection Agency (EPA) has issued a final new health standard for sulfur dioxide (SO₂). The one-hour health standard will protect millions of Americans from short-term exposure to SO₂, which is primarily emitted from power plants and other industrial facilities. Exposure to SO₂ can aggravate asthma and cause other respiratory difficulties. People with asthma, children, and the elderly are especially vulnerable to the effects of SO₂.

EPA has set the one-hour SO₂ 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 SO₂ health standards because the science indicates that short-term exposures are of greatest concern and the existing standards would not provide additional health benefits.

EPA has also changed the monitoring requirements for SO₂. The new requirements assure that monitors will be placed where SO₂ 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 (2009, 2010, and 2011) values, we would still meet the new standard at our four SO₂ stations.

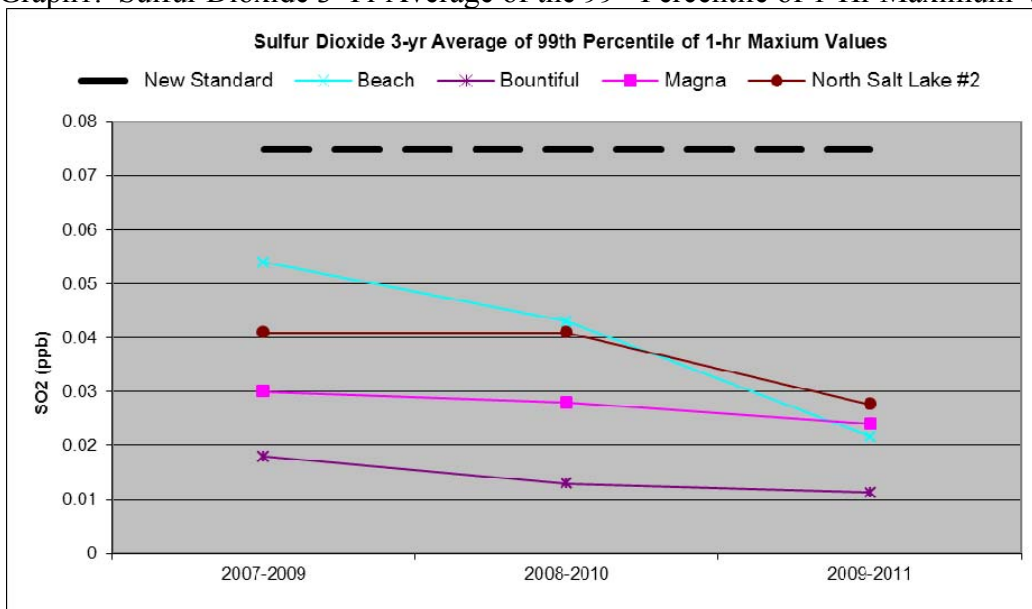
The following table and graph shows the values for the last three years.

Table 2. Evaluation of Utah Monitors for New SO₂ Primary Standard.

Evaluation of Utah Monitors for New SO ₂ Primary Standard					
Year	B4	BV	HW*	MG	N2
2009	0.026	0.013		0.028	0.038
2010	0.022	0.013		0.026	0.027
2011	0.017	0.008	0.007	0.018	0.018
3 yr Average	0.022	0.011		0.024	0.028
Standard	0.075	0.075	0.075	0.075	0.075

HW data set is less than full year

Graph1. Sulfur Dioxide 3-Yr Average of the 99th Percentile of 1-Hr Maximum Values.



Changes to the SO₂ Monitoring Network

The State will continue SO₂ monitoring at Beach, Bountiful, Hawthorne, Magna, and North Salt Lake stations.

Table 3. Analysis of the PWEI for Determination of Monitoring Requirements.

CBSA	Counties in CBSA	PWEI	Number of Monitors required
Salt Lake City, UT MSA	Salt Lake/Tooele/Summit	82065	1
Ogden-Clearfield, UT MSA	Davis/Weber/Morgan	8993	0
Brigham City, UT μ SA	Box Elder	134	0
Heber, UT μ SA	Wasatch	12	0
Provo-Orem, UT MSA	Utah/Juab	4130	0
St. George, UT MSA	Washington	265	0
Logan, UT-ID MSA	Cache/Franklin	193	0
Cedar City, UT μ SA	Iron	215	0
Vernal, UT μ SA	Uintah	17	0
Price, UT μ SA	Carbon	1113	0

Data from the 2008 National Emissions Inventory and 2008 United States Census Estimates were used in the PWEI calculations. Micropolitan Statistical Area (μ SA) Metropolitan Statistical Area (MSA)

The new SO₂ standard requires analysis of the population weighted emissions index (PWEI) for each core based statistical area (CBSA) to determine the number of SO₂ monitors needed in each CBSA. Table 3 shows the CBSA's contained in Utah or shared with another State. The Salt Lake, Tooele, Summit CBSA is the only area with required monitoring for the new standard. We will also continue to evaluate these monitors to determine if they are all still required or if any of them can be removed from the network.

Special Studies

No special studies are planned.

2.2 NITROGEN DIOXIDE

The existing Nitrogen Dioxide (NO₂) 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 NO₂ 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, NO₂ monitoring stations have been co-located with PM_{2.5} and ozone monitors to better understand and model the formation of these pollutants. All NO₂ monitoring sites have consistently measured concentrations well below the NAAQS.

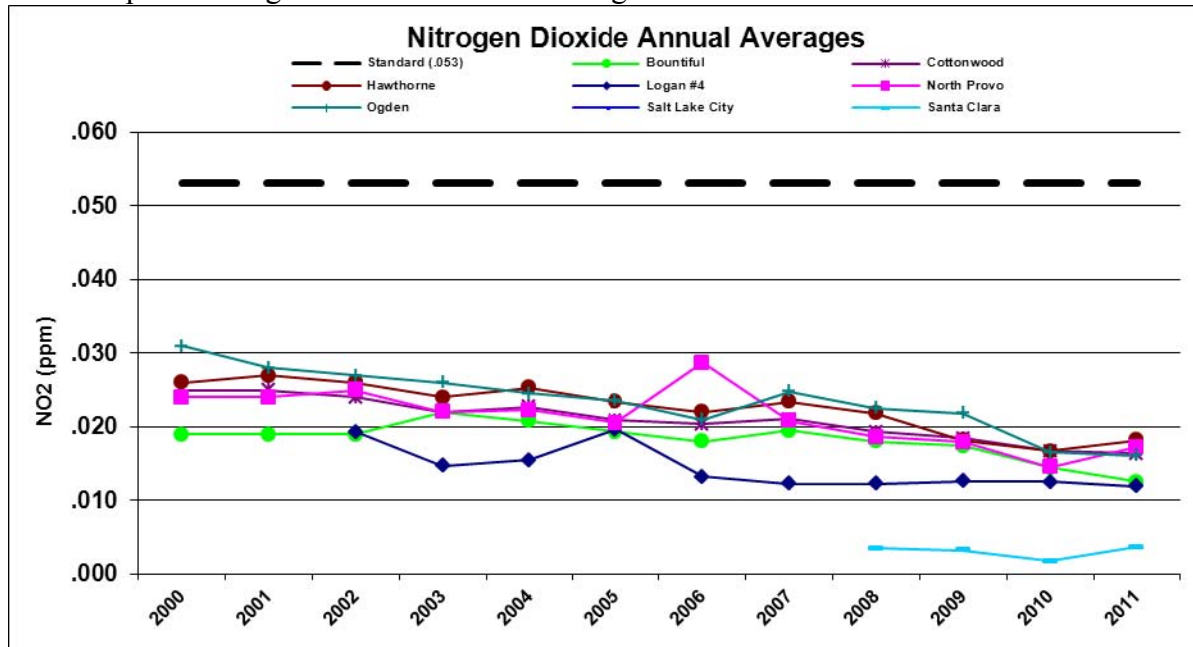
Data Review from the Existing Monitoring Network

The existing NO₂ monitoring stations are: Ogden #2, North Provo, Bountiful, Hawthorne, Logan #4, Cottonwood, Fruitland, Price, and Santa Clara.

The following displays the annual average NO₂ 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 2011 to be representative.

Over the years, NO₂ has not been close to exceeding the standard. The concern from NO₂ is its involvement in the creation of ozone and fine particulate matter. Because of that concern, NO₂ controls have been required on vehicles and industry. As a result of those controls, a close review of the graph shows a decreasing trend.

Graph 2. Nitrogen Dioxide Annual Averages.



New NO₂ Standard

On January 22, 2010, EPA strengthened the health-based National Ambient Air Quality Standard for nitrogen dioxide (NO₂). 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 NO₂ 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 NO₂ 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 NO₂ standard of 53 ppb, which Utah has never exceeded. Below is a table which shows where Utah stands with the new NO₂ standard for the last four years (2007-2010).

Table 4. Evaluation of Utah Monitors for New NO₂ Primary Standard.

Evaluation of Utah Monitors for New NO₂ Primary Standard (Standard = 0.100 ppm)										
	Year	BV	CW	HW	L4	NP	O2	SC	FL	P2
Yearly 98% Daily Max. 1-Hr NO₂ Concentrations	2008	0.063	0.063	0.064	0.047	0.057	0.067	0.019		
	2009	0.062	0.057	0.056	0.046	0.056	0.064	0.021		
	2010	0.050	0.058	0.054	0.047	0.050	0.057	0.014		
	2011	0.050	0.059	0.057	0.048	0.058	0.052	0.019	0.016	0.035
3 yr. Average	2008-2010	0.058	0.059	0.058	0.047	0.054	0.063	0.020		
	2009-2011	0.054	0.058	0.056	0.047	0.055	0.058	0.018		

Fruitland and Price; less than one year data in 2011

Changes to the NO₂ monitoring network:

EPA has proposed revisions to the NO₂ NAAQS. Included in the proposed revisions EPA is requiring near road monitoring in any urban area with populations greater than or equal to 350,000 people. UDAQ has identified three areas that will require near road monitors. In addition to the near road monitor Part 58 requires the designation of an area-wide NO₂ monitor. The Hawthorne monitor meets this requirement and will be designated as the Salt Lake/Davis MSA NO₂ monitor in accordance with 40 CFR Part 58 Appendix D.

Also, the Administrator must require an additional 40 monitors above the minimum required with “the primary focus on siting these monitors in locations to protect susceptible and vulnerable populations.” The Ogden monitor has been selected as one of these 40 monitors by the EPA Region VIII Regional Administrator in accordance with 40 CFR Part 58 Appendix D, 4.3.4.

Near Road NO₂ monitoring

Preliminary near road monitoring sites have been selected for Utah county MSA, Salt Lake-Davis MSA, and the Ogden-Clearfield MSA. Sites were selected based on the TAD for near road monitoring provided by EPA. All sites selected meet the requirements of the TAD.

EPA has developed a build and hold plan which provides that sites in the most populated areas be established first as resources permit while the other sites are on hold awaiting additional resources. The Salt Lake-Davis MSA site has been identified by EPA as phase I implementation with funding coming in the second round of funding. Funding for this site is expected in the near future. The site is expected to be up and running by January 1, 2014. The other locations will be addressed as resources permit. Details of the site proposal are found in Appendix B.

Special Studies

DAQ is participating in a three state study for ozone and precursor NO₂ concentrations in the Uintah basin.

In response to high ozone concentrations reported in the Uinta Basin, DAQ, with support and cooperation with the BLM has installed NO₂ monitors at Fruitland and Price. These two sites are measuring NO₂ as a precursor for ozone formation.

Total Oxides of Nitrogen NO_y

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 the NO_y includes compounds other than NO and NO₂. 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 meters above the ground as opposed to 2 meters for the NO₂. Trace level NO_y monitoring at the Hawthorne NCore site began in the fourth quarter of 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

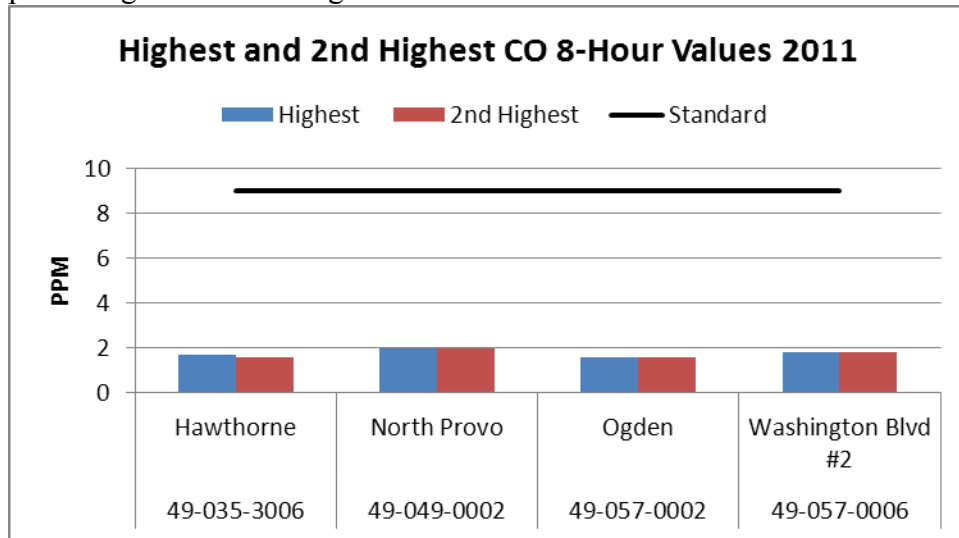
At the time the monitors were first installed, violations of the CO NAAQS were routinely recorded in Ogden, Provo, and Salt Lake City. The State developed and implemented State Implementation Plans and Maintenance Plans for those three areas that were subsequently approved by EPA. The implementation of those plans has resulted in all three areas attaining the CO NAAQS and being re-designated 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, 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, we propose 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

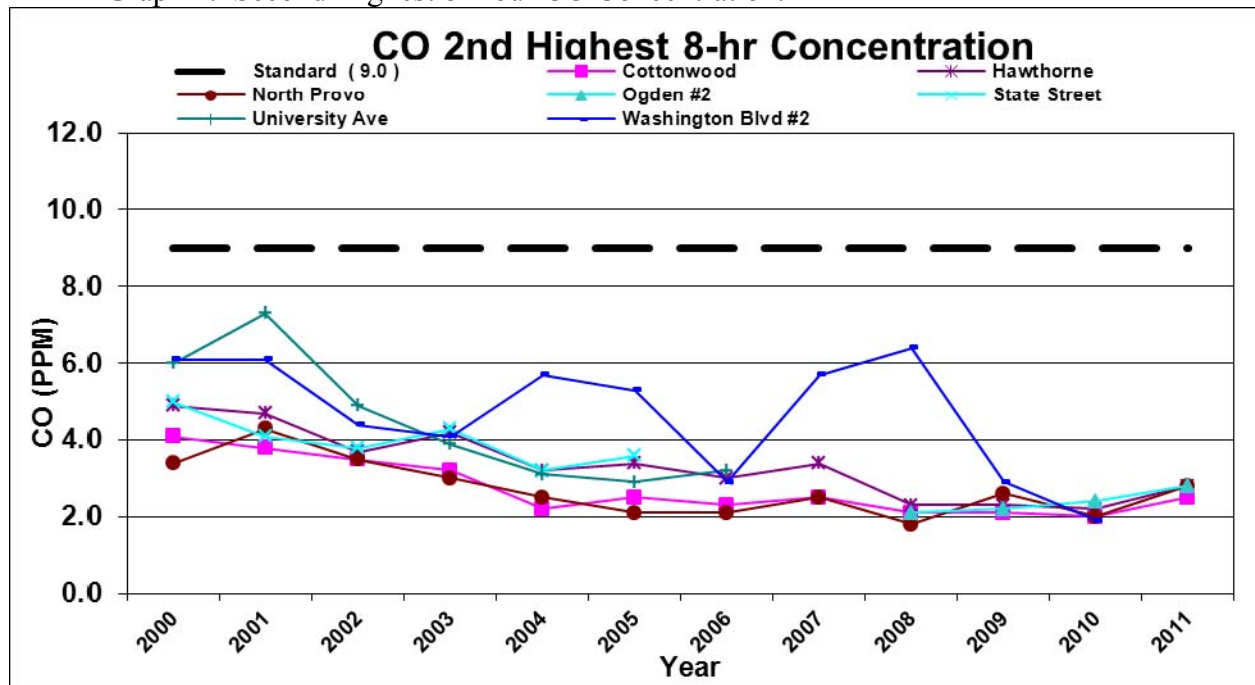
The following graph displays the highest and second highest 8-hour values for the monitoring stations. As can be seen, the highest values are much less than the standard.

Graph 3. Highest and 2nd Highest CO 8-Hour Values for 2011.



The following graph shows the trend in the second highest CO concentrations from 1993 through 2011. 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.

Graph 4. Second Highest 8-Hour CO Concentration.



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, Ogden #2, Hawthorne, 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, DAQ will include CO monitoring at the Salt Lake near road NO₂ monitoring site. Monitoring will begin January 2017.

Special Studies

No special studies are planned.

2.4 OZONE

Unlike carbon monoxide, SO₂, and NO₂, ozone is 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 downwind 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.

Over the past several winters, the Uintah Basin has experienced numerous periods when ozone levels have peaked at very high levels, nearly twice the federal health standard. Ozone is typically associated with urban areas during hot summer periods, but in the Basin, the high concentrations are occurring during winter temperature inversions when snow covers the ground. The ozone levels during these periods have the potential to impact public health, and affect the local economy if mandatory federal requirements are required. Recognizing the implications of being classified as non-attainment, local and state officials are moving in a proactive, cooperative effort to understand the unique nature of the Uintah Basin's wintertime ozone problem and what can be done about it. Because ozone is formed chemically in the atmosphere and not emitted directly from sources, understanding how to control it is a complex problem. Part of this proactive

effort involves participation in long-term monitoring and short-term monitoring campaigns.

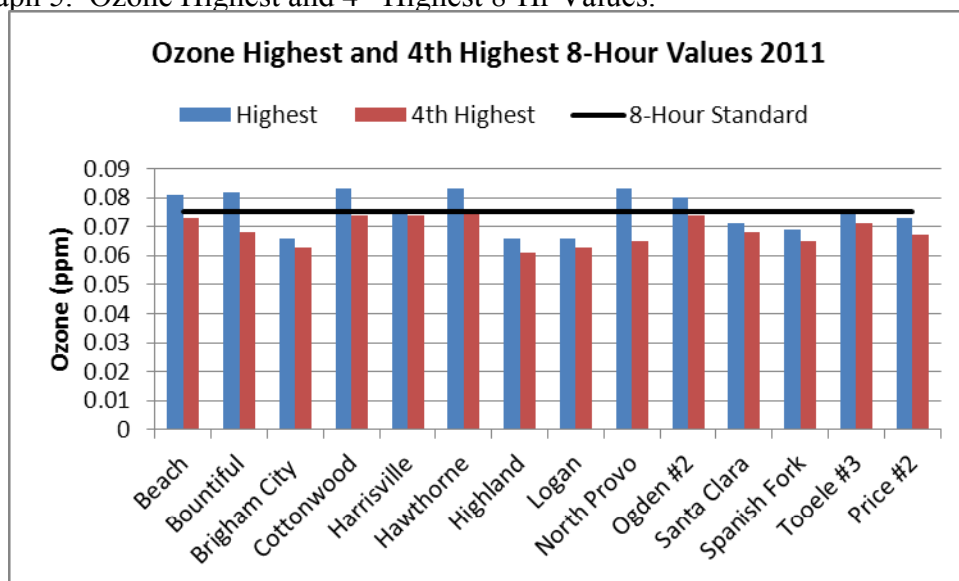
Most of the longer-term air quality data for the Basin has come from two EPA monitors, Ouray and Redwash, located on Indian Country where the State has no jurisdictional air authority. Recently, as part of Utah's participation in the 3-State Study, federal land managers have provided DAQ with temporary funding for 2 additional monitors in the Basin located at Fruitland and Roosevelt. DAQ has also installed a monitor in Vernal which is used to report real-time ozone, PM_{2.5}, and meteorological data via the Division's web site.

DAQ has participated in two special ozone monitoring campaigns in the Basin. The first was conducted in the winter of 2010/2011 with Utah State University (USU) and the Energy Dynamics Laboratory (EDL). The purpose was to identify the frequency and breadth of the Basin's winter ozone problem. The second campaign was conducted this past winter (2011/2012) in conjunction with scientists from USU – EDL, National Oceanic Atmospheric Administration (NOAA), Western Energy Alliance (WEA), and EPA. The purpose of this campaign was to develop emissions inventories, establish ozone baselines, measure chemical formation processes, and collect source specific chemical "finger prints" in order to identify appropriate and effective mitigation strategies for winter ozone in the Basin. The researchers are currently compiling their results and drafting conclusions to be published in the study report due out this October. Recommendations for further study and a direction for ozone mitigation will be part of the report.

Data Review from the Existing Network

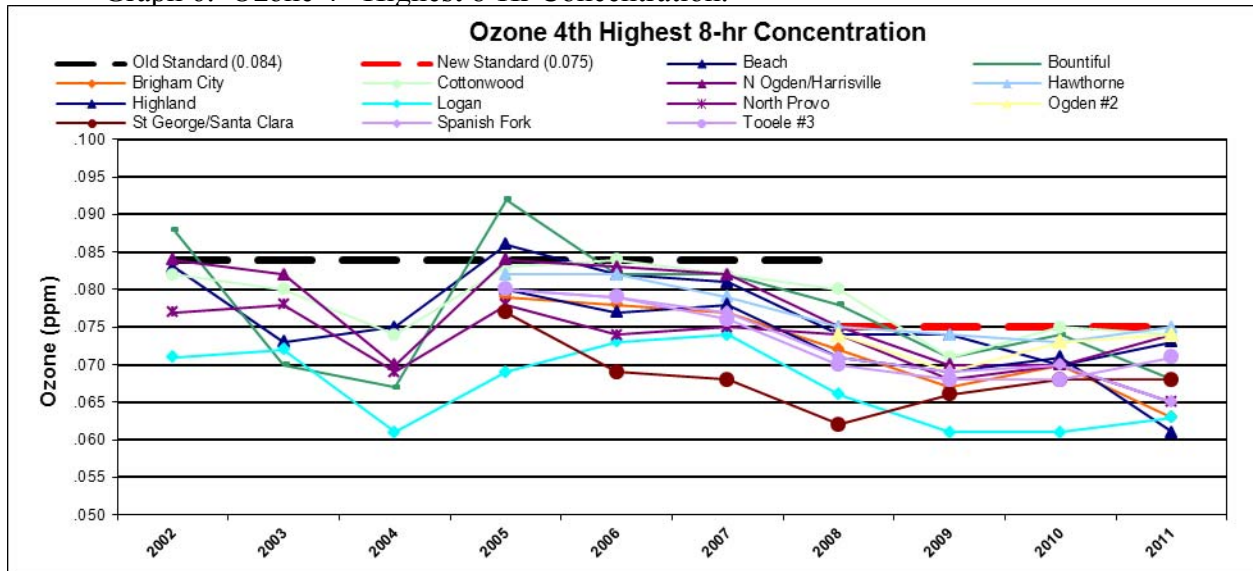
The following graph displays the highest and fourth highest 8-hour values for the monitoring stations.

Graph 5. Ozone Highest and 4th Highest 8-Hr Values.



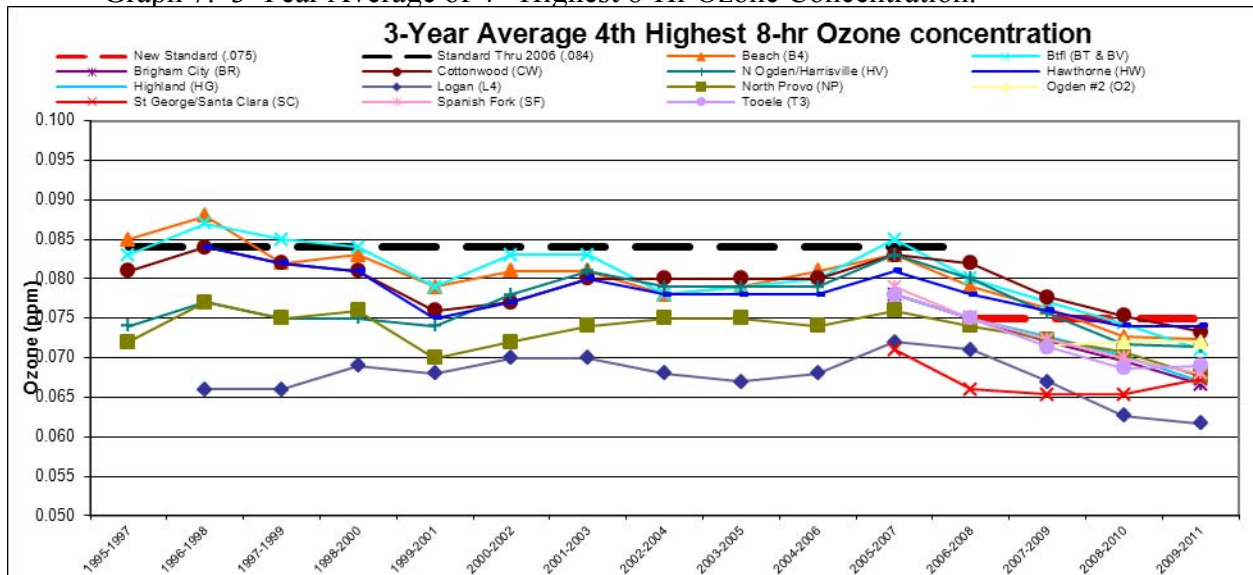
The following graph shows the trend of the 4th highest 8-hour average concentrations of ozone through 2011 for all of the monitoring sites. To comply with the standard, the rolling average of the 4th highest 8-hr ozone average over a three year period should not exceed 0.075 ppm. A review of the ozone data for 2009-2011 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.

Graph 6. Ozone 4th Highest 8-Hr Concentration.



The following graph shows the trend for the rolling 3-year average of the 4th highest 8-hour average ozone concentration for 1995 through 2011. Ozone concentrations have declined over the past three years despite significant population growth. This is due in part 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.

Graph 7. 3-Year Average of 4th Highest 8-Hr Ozone Concentration.



Additional Monitoring

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

Analysis of years of monitoring data has shown that the polluted air mass moves around the Salt Lake 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 three ozone monitors in the Salt Lake / Davis County Maintenance Area. It has been our experience that the Hawthorne and Bountiful monitors usually record the highest ozone concentrations in the air shed. 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, Harrisville, Hawthorne, Logan #4, North Provo, Ogden #2, Santa Clara, Spanish Fork, and Tooele #3. We are 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 have been and 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 transported 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 2012 and 2013.

Another special study will be conducted in the Washington County area. Portable monitors will be located at another location near the border of Utah and Nevada to further address the ozone coming from the Las Vegas/Los Angeles area. The Santa Clara monitoring site will be moved to the Hurricane, Utah area as a result of the data gathered from the 2011 summer ozone saturation study in Washington County.

2.5 PM₁₀ (Particulate matter 10 microns and smaller in aerodynamic diameter)

The PM₁₀ samplers 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.

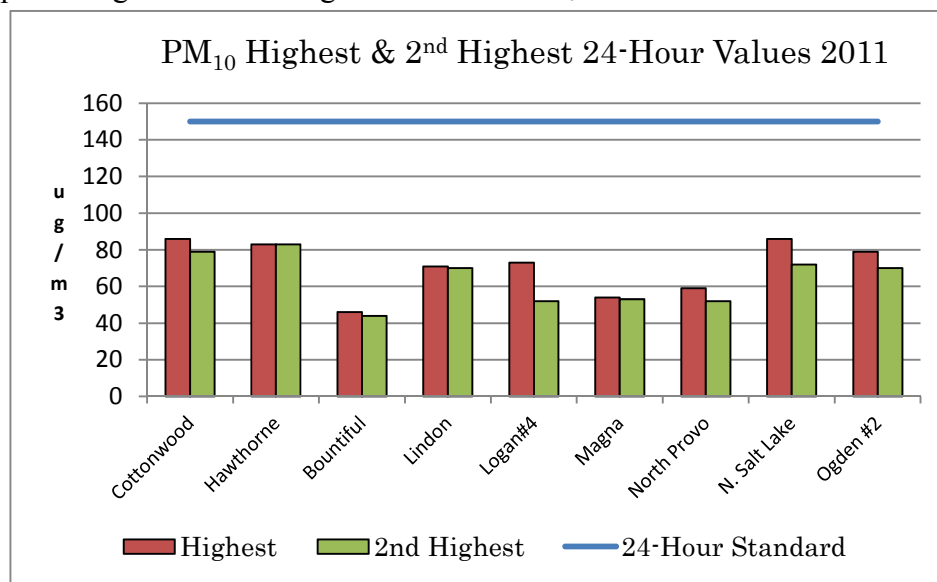
PM₁₀ monitoring is complicated by the fact that there are two types of PM₁₀ particles. Primary particles are released from the source as particles and their concentration decreases from the point of release dependent on dispersion characteristics. Secondary particles are released as gases and become PM₁₀ 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 PM₁₀ 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 PM₁₀ sites have been located based on 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.

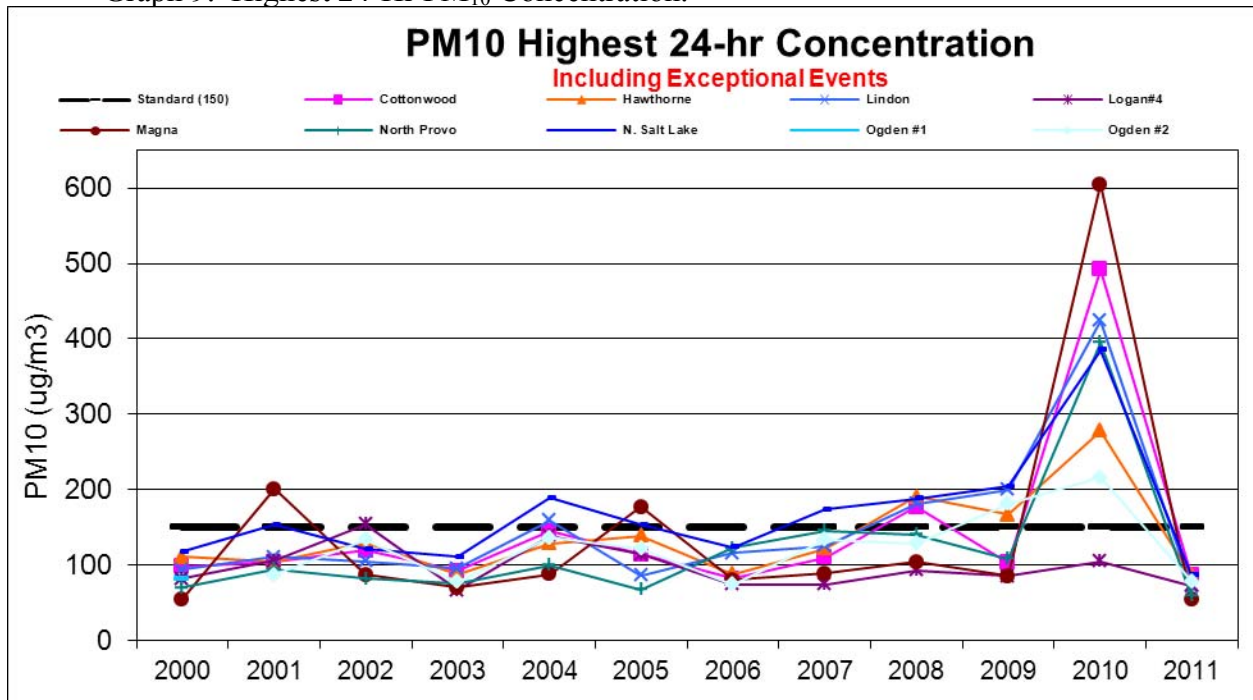
Graph 8. Highest and 2nd Highest 24 Hour PM₁₀ Values



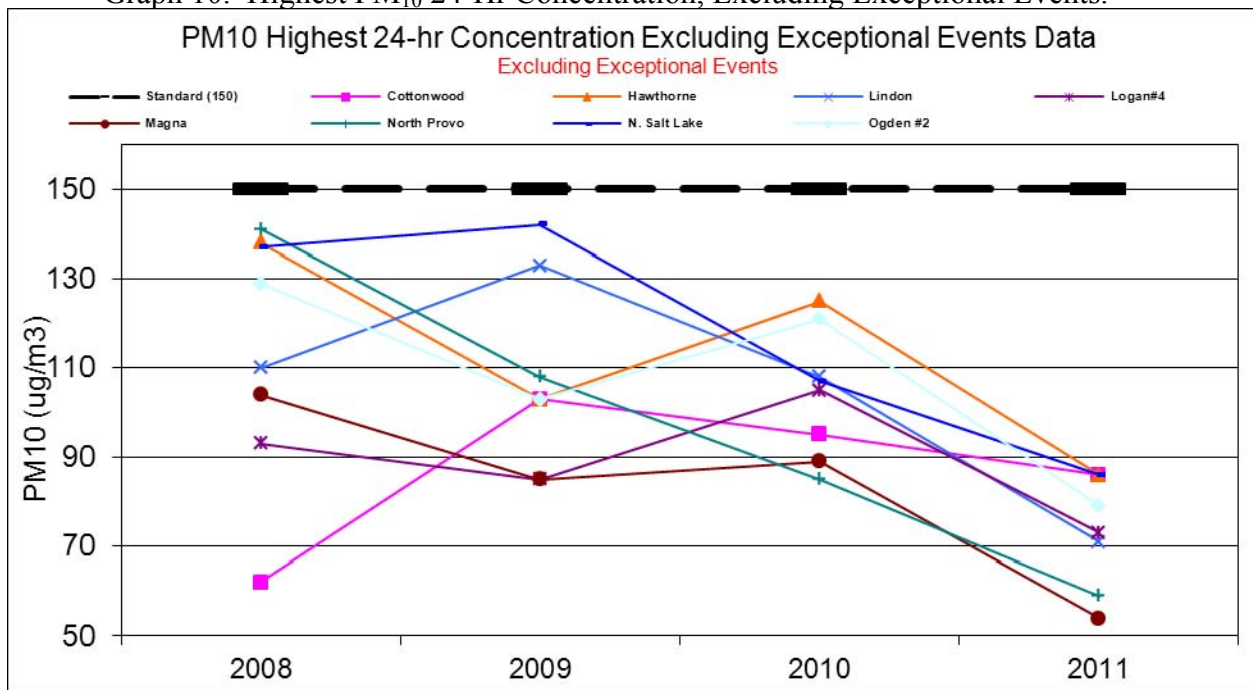
Graph 8 and 9 show the PM₁₀ trends from 1990 through 2010. Although the PM₁₀ concentrations stayed mostly below the NAAQS threshold through 2005, an increasing trend is observed starting 2006. These violations are attributed to high wind gust episodes in the Utah and Salt Lake valleys and resulted in exceptionally high PM₁₀ 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 PM₁₀ concentrations reached a one-hour average of 693 ug/m³. March 30, 2010, was a day of sustained high winds, PM₁₀ concentrations reached the highest concentrations recorded by DAQ with hourly values greater than 1000 ug/m³. High particulate concentrations were recorded from Utah County to Weber County. Graph 9 shows all data, including the windblown dust events while Graph 10 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.

Graph 9. Highest 24-Hr PM₁₀ Concentration.



Graph 10. Highest PM₁₀ 24-Hr Concentration, Excluding Exceptional Events.



Additional Monitoring

No additional PM₁₀ monitoring is necessary at this time.

Special Studies

No special studies are planned for the next year.

Changes To The PM₁₀ Monitoring Network

No changes to the PM₁₀ monitoring network are planned.

2.6 PM_{2.5} (Particulate matter 2.5 micron and smaller in aerodynamic diameter.)

On September 20, 2006, the Environmental Protection Agency promulgated a new NAAQS for particulate matter measured as PM_{2.5}. 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 PM₁₀ 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 PM₁₀ and some limited PM₁₀ saturation sampling also showed that 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

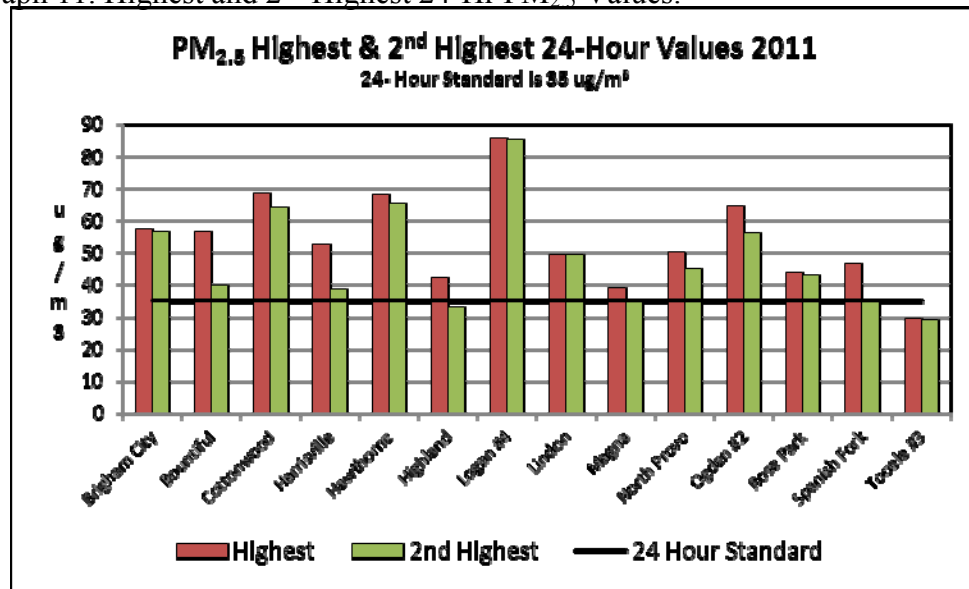
Historically, TSP and PM₁₀ sites were located based on primary particulates, and the PM_{2.5} monitoring sites were located based on concentrations of PM₁₀. The appropriateness of that decision will be reviewed as modeling for PM_{2.5} is performed. To complete the modeling, emission inventory information 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

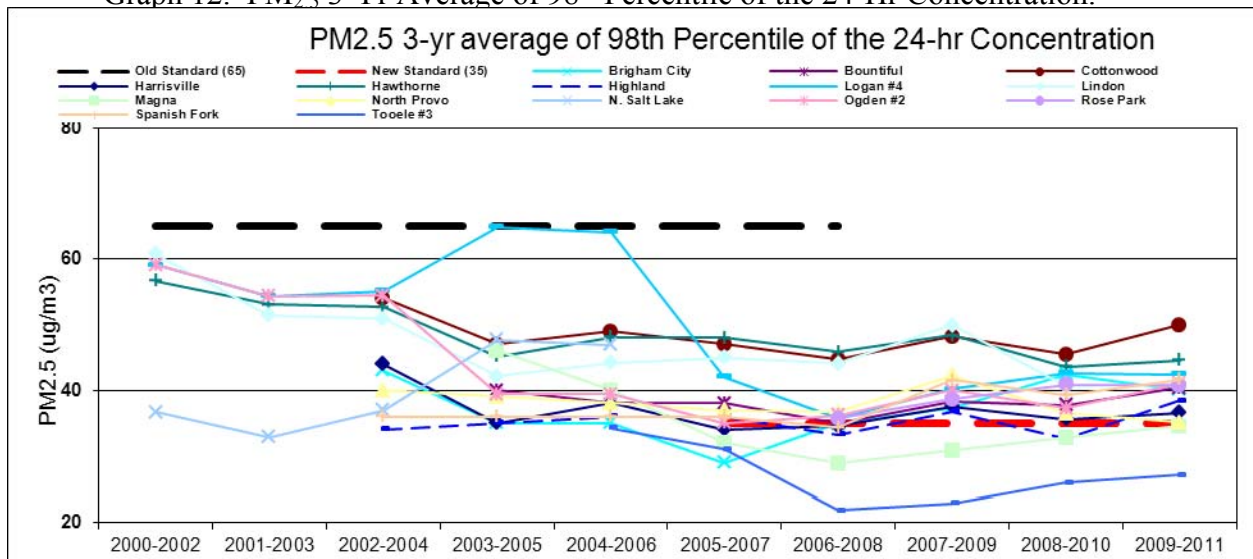
The following graph displays the highest and 2nd highest 24-hour values for the monitoring stations.

Graph 11. Highest and 2nd Highest 24-Hr PM_{2.5} Values.



The following graph shows the historical trend of 3-year rolling average of the PM_{2.5} 98th percentile concentrations measured in Utah. PM_{2.5} concentrations remained steady in violation of the new standard (35 ug/m³) over the last decade.

Graph 12. PM_{2.5} 3-Yr Average of 98th Percentile of the 24-Hr Concentration.



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 received EPA equivalent designation. Real time data is useful for modeling PM_{2.5} concentrations. To support real time notification to the public, we propose 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 PM₁₀. If the regulation is published in the Federal Register, we will incorporate that into the PM monitoring plan. DAQ is in position to generate PM_{coarse} data as we currently meet requirements for the manual collection of that data by subtraction of PM_{2.5} filter based concentrations from PM₁₀ filter concentrations. PM_{coarse} is presently required at NCore sites and is monitored at our NCore site using filter subtraction .

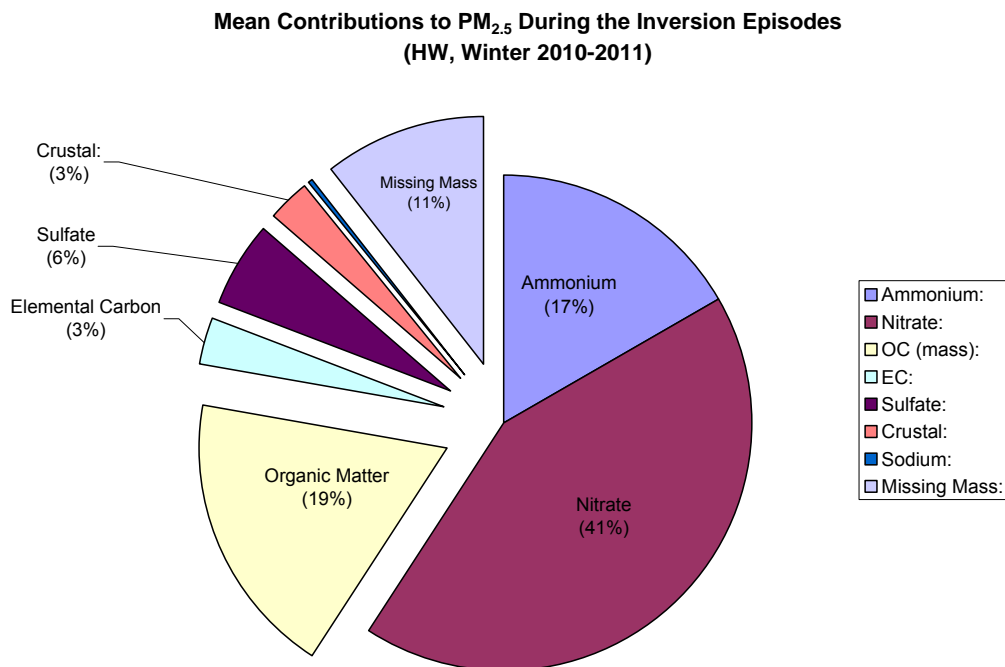
No changes to the PM_{2.5} network are planned for 2012.

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 sites (STN) 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, major cation and anions, 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 dependent on the specific compounds of interest. Data undergoes level one and two review and data checks by the contract laboratory. The data is 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 shows 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 has identified the contribution of soils during high wind events.

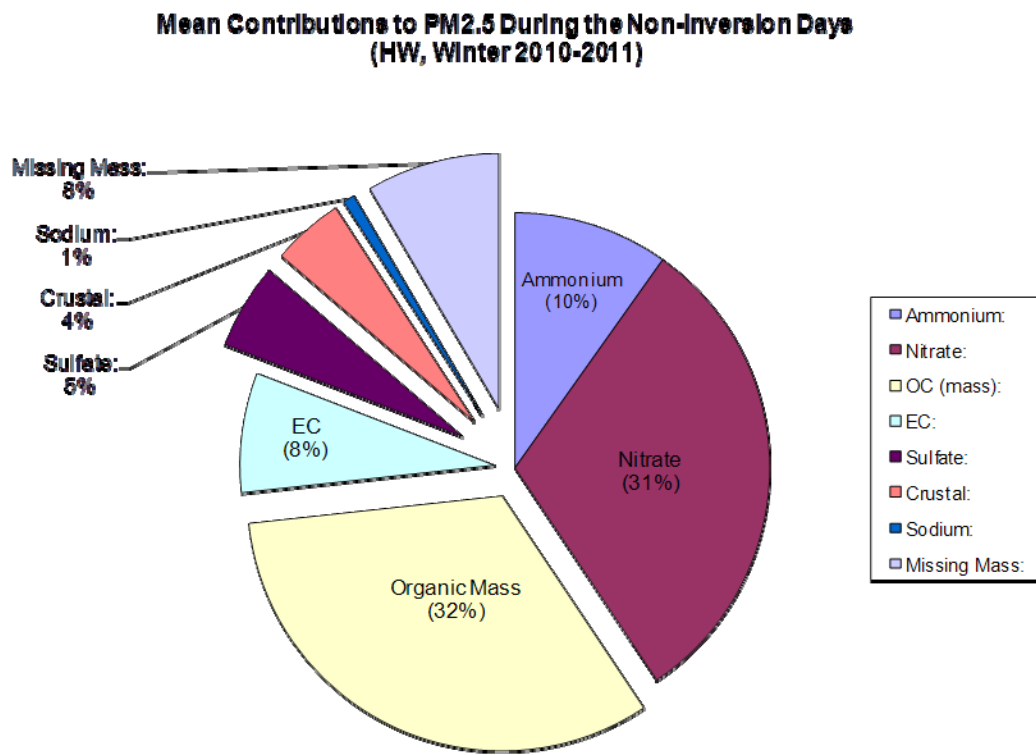
Graph 13 shows the contribution of the identified compounds from the speciation sampler during a winter atmospheric inversion period. Graph 16 shows the contribution of identified compounds from the speciation sampler during a clear winter period.

Graph 13. Mean Contributions to PM_{2.5} During Inversion Episodes.



Average concentration 37.4 ug/m³ n = 11

Graph 14. Mean Contribution to PM_{2.5} During the Non-Inversion Days.



Average concentration 10.2 ug/m³ n = 23

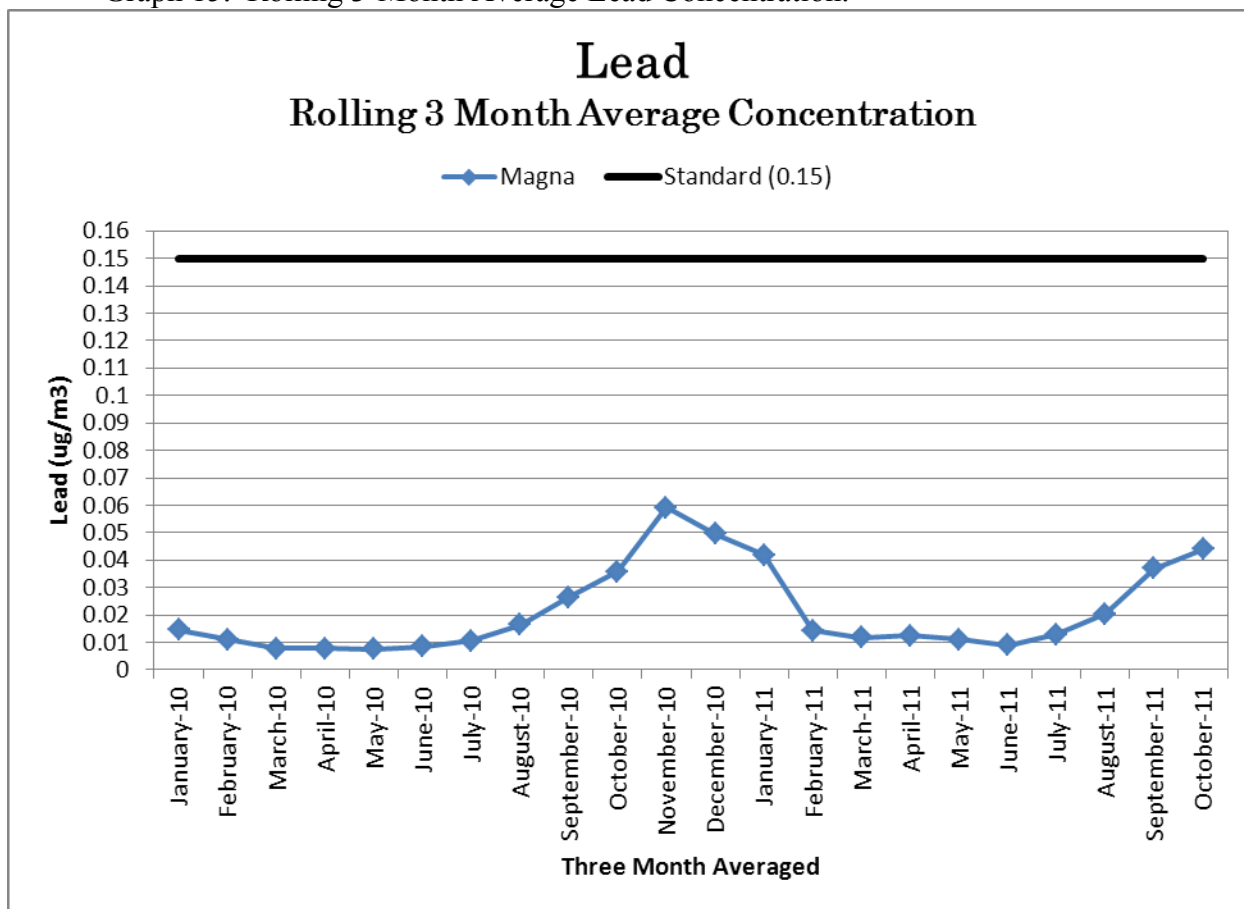
2.7 TOTAL SUSPENDED PARTICULATE, LEAD

Starting in 2009, DAQ began operating a particulate lead (Pb) sampler at the Magna site. Source oriented, year around 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.

One hundred twelve samples were collected and analyzed for lead in 2010 and 2011. The average 24-hour concentration was $0.022\mu\text{g}/\text{m}^3$, the maximum concentration measured was $0.14\mu\text{g}/\text{m}^3$, January 27, 2011. The maximum three-month-rolling average was $0.06\mu\text{g}/\text{m}^3$. The lead NAAQS level is set at $0.15\mu\text{g}/\text{m}^3$ over a three-month-rolling average. Our maximum 3-month monitored concentration is 39% of the standard. Graph 15 shows the rolling 3-month average concentration.

2010, DAQ discovered a problem with quality assurance checks, which could lead to invalidation of the year data. Alternately we have entered the data into the AQS database with a qualifier flag indicating the QA problem. The error may have caused at most an increase in our measured concentration of 12%, bringing the maximum rolling average to $0.067\mu\text{g}/\text{m}^3$ or 45% of the NAAQS. DAQ feels the data has 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.

Graph 15. Rolling 3-Month Average Lead Concentration.



Additional Monitoring

Lead monitoring began at the Hawthorne site December 2011.

Special Studies

No special studies are planned for the next year.

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 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.

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 33 toxic air pollutants to focus on 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 in May 2007, began monitoring for mercury in the ambient air.

Sampling Locations

Specific sources of toxic pollutants have been identified using SARA 313 information and a toxic air pollution survey conducted by Radian for DAQ. Toxic monitoring at these sources was not conducted for the initial sampling phase of the program; rather a general survey of the air contaminants was initiated. Monitoring near specific sources is being performed based on identified need. Historic sampling has been performed at 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. In West Valley, 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. Table 5 shows the last calculation of Bountiful toxics data compared to cancer and non-cancer risks summaries. The data, from 2007, is shown as the more current raw data would not be readily comparable without reference to national standards.

Abbreviations used in Table 5:

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

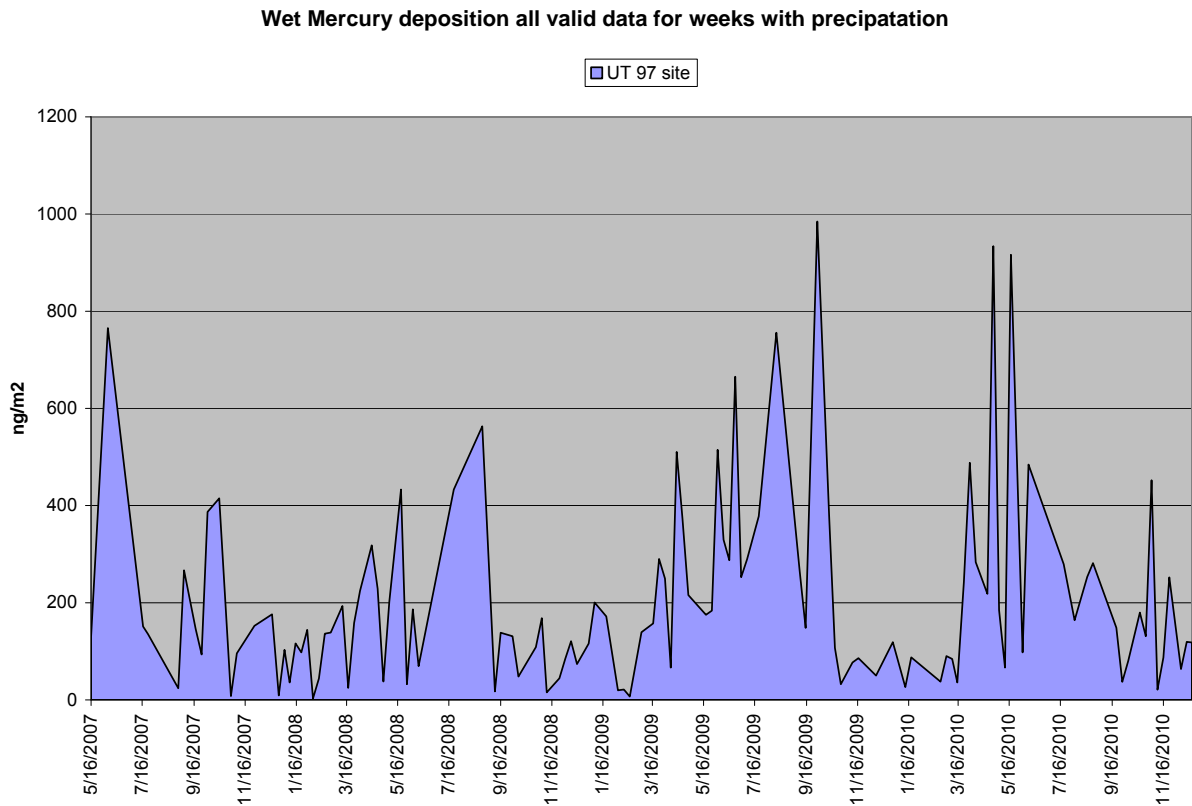
Table 5. Monitored Toxics Data at Bountiful Compared to Cancer and Non-Cancer Risks.

	Cancer URE ($\mu\text{g}/\text{m}^3$)	Noncancer RfC (mg/m^3)	1999 NATA			2007 NATTS/UATMP		
			Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Cancer Risk (in-a- million)	Noncancer Risk (HQ)	Annual Average ₁ ($\mu\text{g}/\text{m}^3$)	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 \pm <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 \pm <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	$0.04 \pm <0.01$	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 \pm <0.01	0.37	<0.01
Manganese (PM ₁₀)	--	0.00005	<0.01	--	0.01	$0.01 \pm <0.01$	--	0.20
Nickel (PM ₁₀)	0.00016	0.000065	<0.01	0.05	<0.01	<0.01 \pm <0.01	0.31	0.03
1,1,2,2-Tetrachloroethane	0.000058	--	0.04	2.40	--	$0.05 \pm <0.01$	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

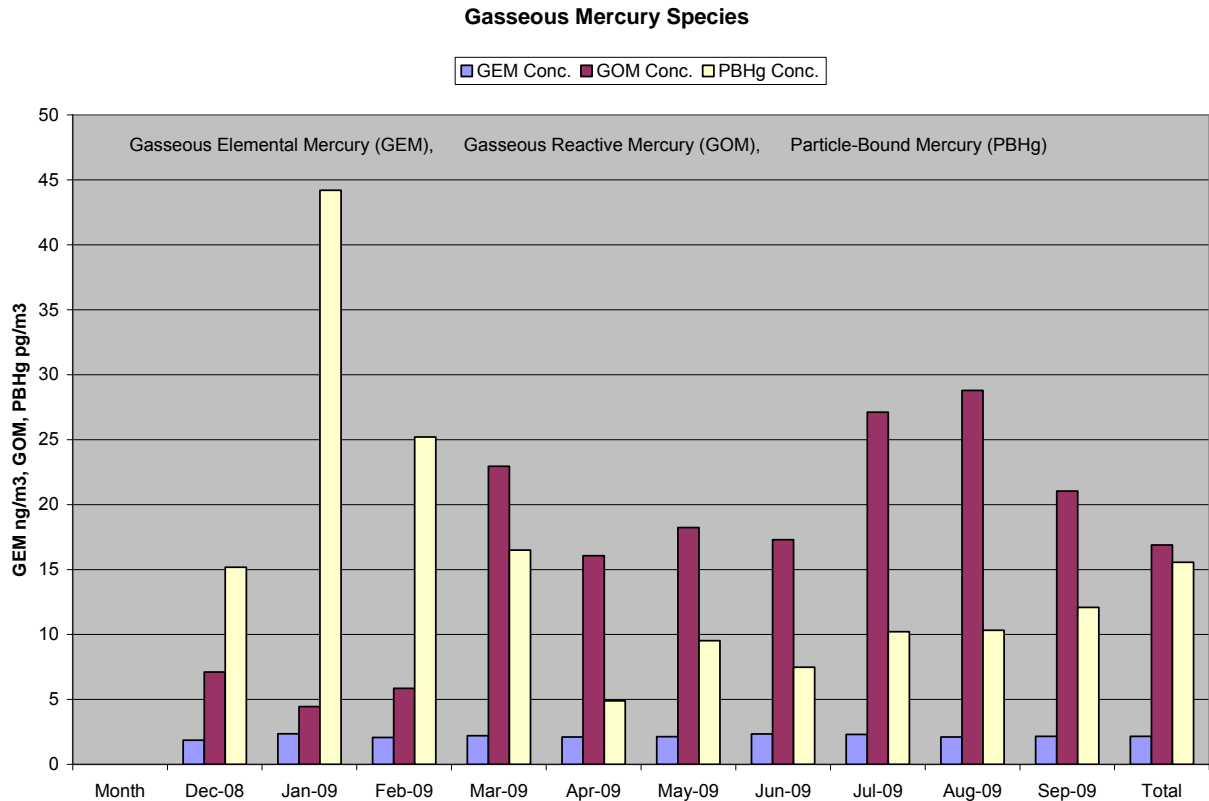
The wet Mercury Deposition Network sampler is located on the roof of the Air Monitoring Center (AMC) in the western Salt Lake City suburb of West Valley City. Monitoring for mercury began in May 2007. Graph 16 shows the valid data for the wet deposition site. Gaseous, particulate bound and reactive mercury is also monitored at the AMC site.

Graph 16. Wet Mercury Deposition all Valid data for weeks with Precipitation.



Graph 17 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.

Graph 17. Gaseous Mercury Species.



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, 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.

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 foot shelters were placed as far away from the trees in neighboring yards as could be arranged with the School District. Monitoring for NOY, trace level SO₂, trace level CO, real time PM₁₀, PM_{2.5}, PM_{10-2.5}, and PM_{2.5} speciation began in the fourth-quarter of 2010. In addition, filter-based PM₁₀, filter based PM_{2.5}, NO₂, and real time OC/EC, are monitored. Intensive monitoring periods for secondary particulates and NMHC can be monitored at this site. The site has a full complement of meteorological equipment as detailed in the site description form. Since the start of the NCore site we have started monitoring for lead using the PM₁₀ filters. This analysis started December 2011.

All the required paperwork and recommendations have been submitted to National EPA for assignment of Hawthorne as Utah's NCore site. We have been

assured that the modifications completed to the site will result in approval by EPA.

B.0 APPENDIX B- Near Road Monitoring Proposal

To comply with the new near roadway NO₂ requirements in CFR 40 Part 58 Appendix D 4.3.2., Utah will need three near road monitoring sites in the three CBSA's along the Wasatch Front. The siting of these monitors should be at the location of highest annual average daily traffic count (AADT) adjusted for heavy duty trucks, modified AADT. The monitor should be located as near the outside lane as possible with the inlet two to seven meters above ground level. Sound walls and the elevation of the freeway above the surrounding areas complicate the siting.

The two proposed locations for the Salt Lake/Summit/Tooele MSA monitor were located at the high modified AADT ranked locations, Table 6, with no sound wall and with an elevation even with the road.

Table 6. Salt Lake/Summit/Tooele CBSA Monitor Locations Ranking.

Ranked by 2009 AADT

Modified AADT 6-13 Rank	Bmp	AADT	3 thru 6 % single	9 thru 12 %combo	Modified AADT	Location	# lanes	Congestion
1	304.72	244525	5	3	420583	I80 201 interchange	10	24453
2	297.94	224879	8	4	467748	7200 S	12	18740
3	305.23	223514	3	3	344212	2100 S	10	22351
5	295.64	193595	6	4	367831	9000 S	10	19360
4	303.44	206586	6	3	373921	3300 S	12	17216
6	306.35	198448	4	3	323470	1300 S	10	19845
7	301.67	199101	8	3	396211	4500 S	12	16592
8	300.33	194794	9	3	405172	5300 S	12	16233
10	293.63	150156	4	5	271782	10600 S	10	15016
9	298.99	168179	11	3	380085	I 215 interchange	12	14015
11	291.37	140146	13	6	379796	12300 S	10	14015
13	289.83	130855	9	6	307509	Bangerter	10	13086
12	307.49	157307	4	3	256410	500 / 600 S	10	15731
14	288.29	130251	15	5	364703	14600 S	10	13025
23	312.25	129107	2	4	198825	2400 N	8	16138

Ranked by modified AADT

Modified AADT 6-13 Rank	Bmp	AADT	3 thru 6 % single	9 thru 12 %combo	Modified AADT	Location	# lanes	Congestion
2	297.94	224879	8	4	467748	7200 S	12	18740
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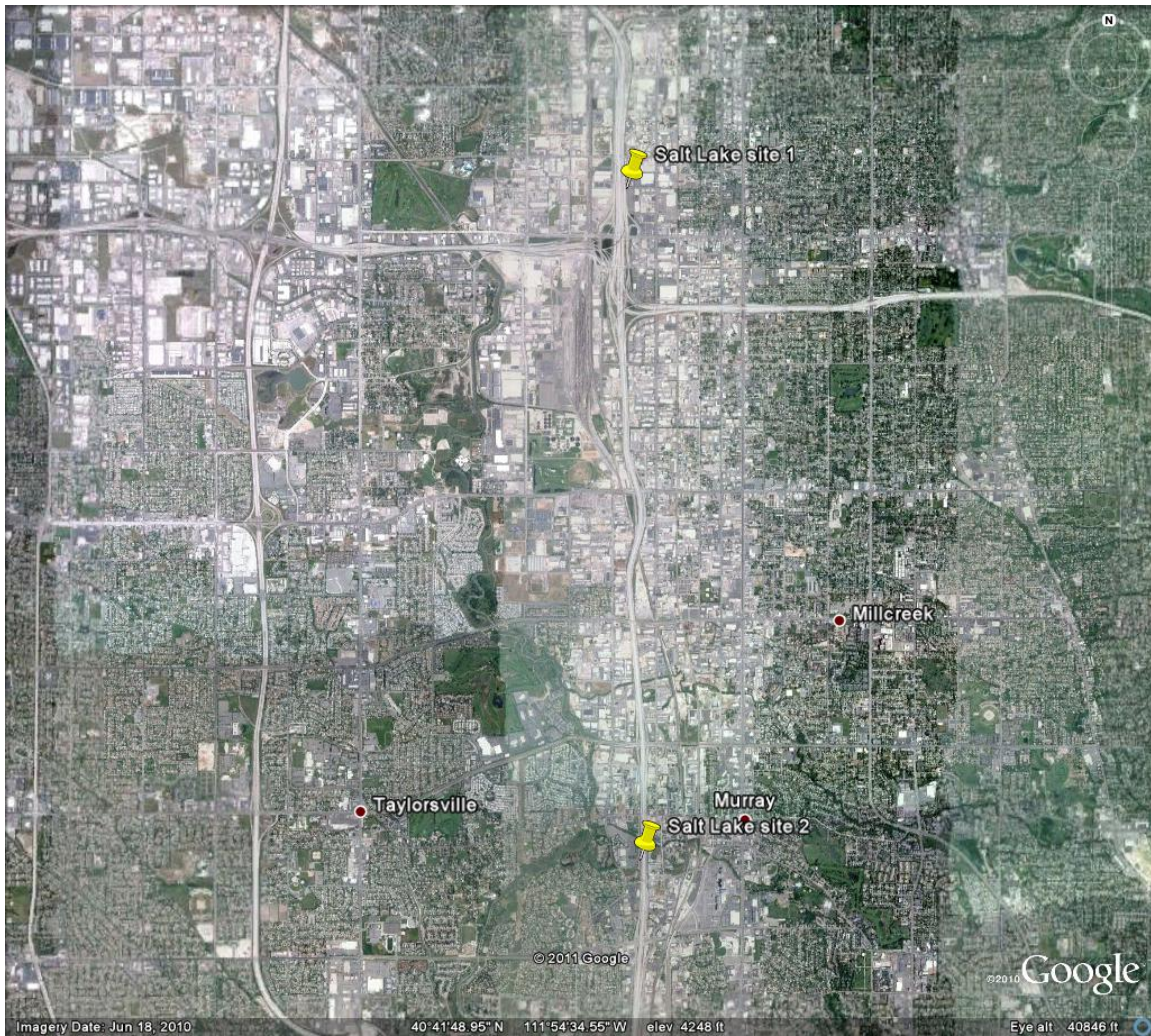


Figure 2. Map of 2 Proposed Near Road Monitor Locations.

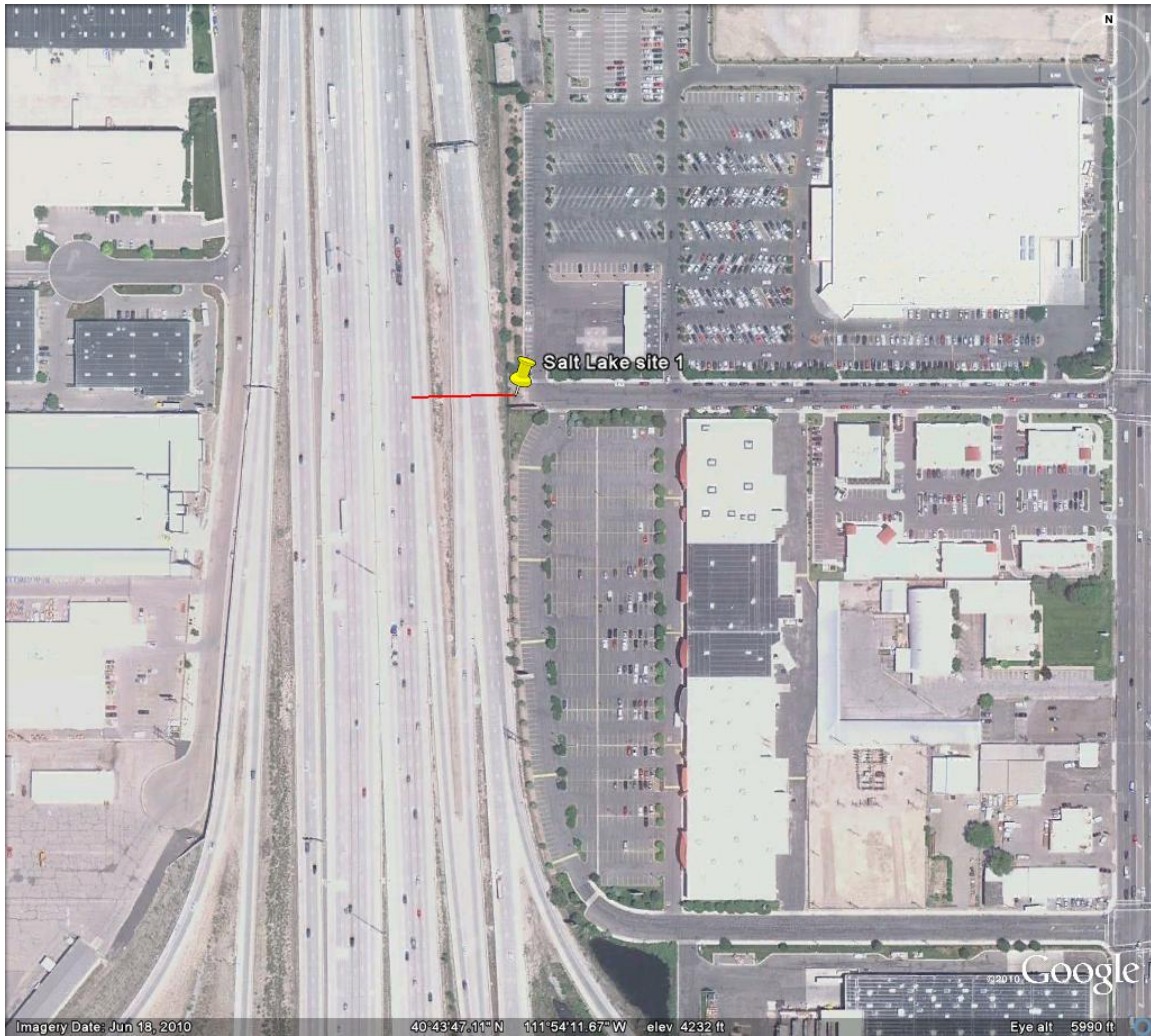


Figure 3. Site 1 Location.

Site 1 is as near the second ranked modified AADT as possible while staying at grade to the freeway. The site is located at the end of the road between Costco and a shopping development parking lot to the south. Power is possible at the sign. The nearest lane is a collector road for the freeway. The distance to the nearest freeway lane is 49 meters.

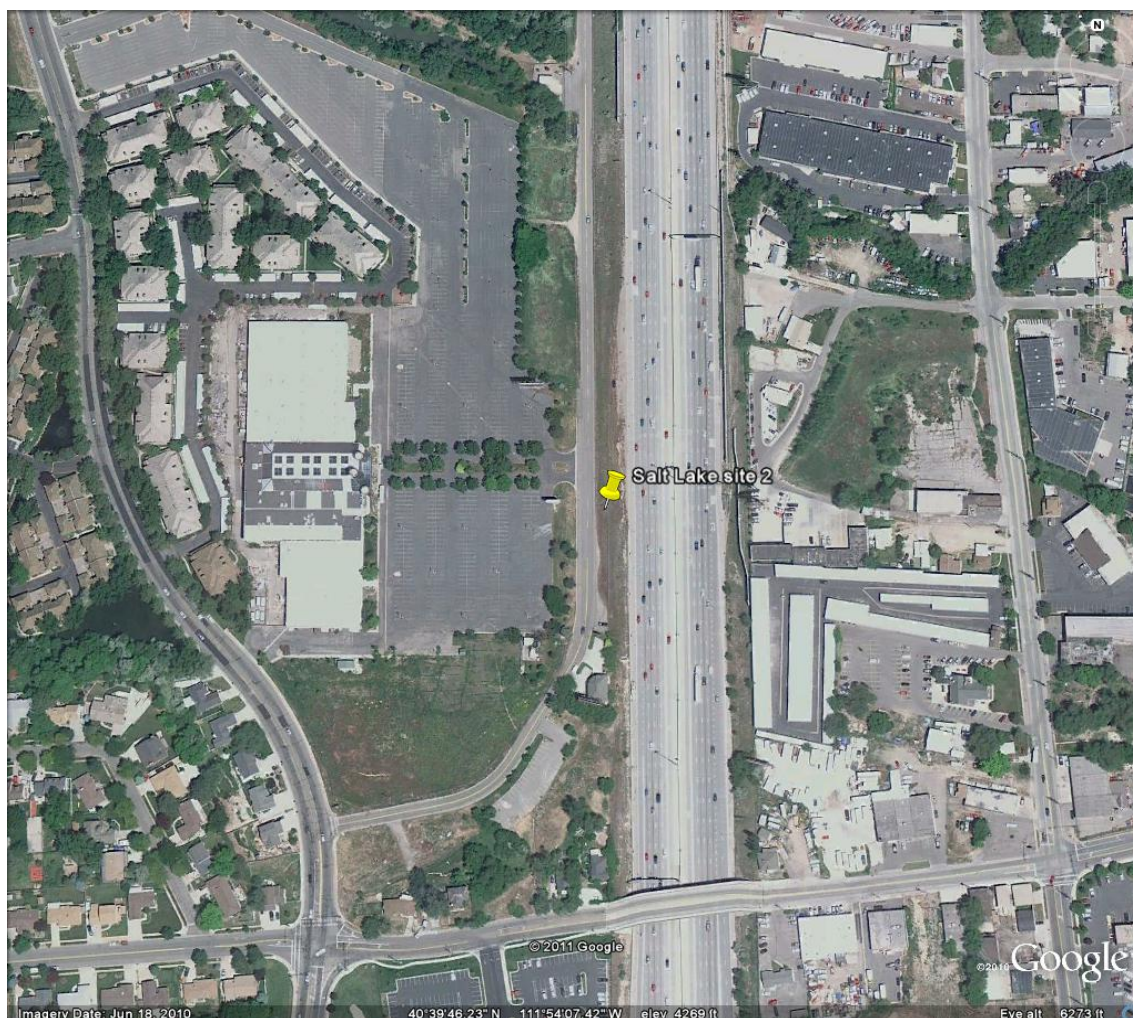


Figure 4. Site 2 Location.

Site 2 is near “49th Street Galleria,” and ranked between the third and fourth highest modified AADT. This site has no sound wall on the west side of the road, and is level with the road. Distance from the fence to the nearest lane is 19 meters.

REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/04)						
DATE: 5-30-2012		CITY: Salt Lake City			STATE: Utah	
AQ5 SITE ID:		SITE NAME: Salt Lake Near Road Site				
PROPOSED MODIFICATION/REASON WHY: A monitoring site is planned 4804 South 360 West to monitor for the new one hour NO ₂ standard. The site will be located within 50 meters of the roadway.						
AIR QUALITY PARAMETER (PM10, SO ₂ , CO, NO ₂ , ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
NO ₂	SLAMS	X		X		Thermo 42i TL
CO	SLAMS	X		X		Thermo 48i TLE
PROPOSED SAMPLING START OR REMOVAL DATE OR DATE STARTED OR REMOVED: Sampling to start in January 2013 2014						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:						
LOCATION (LAT./LONG. OR UTM=S): 40° 39.772' N 111° 54.112' W						
SITE ELEVATION (M. MSL): 1303				PROBE HEIGHT (M. AGL): 4		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
28 m	Southeast	146 m	West	6 m		
UNRESTRICTED AIR FLOW:		>270 DEG. X	>180 DEG.	<CRITERIA _____ DEG.		
DISTANCE TO FLUES/INCINERATORS (M): 939 m						
DISTANCE TO INTERSECTIONS (M): 308 m			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. _____ HORIZ. _____			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
		NORTH				
20.76 m	Interstate 15	EAST	198,300	2010	Freeway	
		SOUTH				
		WEST				
DISTANCE TO NEAREST POINT SOURCES (MILES)		DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS
.58 miles		SSE				
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.						

C.0 APPENDIX C- PUBLIC COMMENTS ON MONITORING PLAN

The comments received during the public inspection of the monitoring plan will be evaluated and the plan may 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