

2009  
Ambient Air Monitoring Network Plan

Pima County Department of Environmental Quality  
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AQ 370



# 2009 Ambient Air Monitoring Network Plan

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## I. INTRODUCTION

### 2009 Ambient Air Monitoring Network Plan

This document constitutes the 2009 Ambient Air Monitoring Network Plan for the Pima County air monitoring network. The Pima County Department of Environmental Quality (PDEQ) has prepared this document to be submitted to the U.S. Environmental Protection Agency (USEPA), Region IX. The purpose of the Ambient Air Monitoring Network Plan is to determine if the network is achieving the air monitoring objectives specified in 40 CFR Part 58 Appendix D, which mandate adherence to certain number, type and location requirements of monitoring sites and specific site criteria such as monitoring inlet height. The review should also determine if modifications should be made to the network (e.g. through the termination or relocation of unnecessary stations or addition of new stations). In addition, the review is necessary in order to ensure that the residents of Pima County are provided adequate, representative and useful air quality data, and to provide adequate protection to public health.

The designated ambient air pollutants that are monitored and reported by PDEQ are carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and particulate matter with an aerodynamic diameter of 10 micrometers or less in size (PM<sub>10</sub>) and particulate matter with aerodynamic diameter of 2.5 micrometers or less in size (PM<sub>2.5</sub>). This pollutant data is submitted to the EPA Air Quality System (AQS) database for determination of compliance with National Ambient Air Quality Standards (NAAQS). This report contains statistical data summaries for the 2009 calendar year and provides a site by site assessment of the monitoring network with respect to EPA site criteria.

Pima County monitoring network includes both State or Local Air Monitoring Stations (SLAMS) and Special Purpose monitors (SP). SLAMS monitors comprise the required network monitors that are used for NAAQS comparisons and follow the monitoring objectives listed on page 6. SP monitors are used to conduct special purpose studies and to enhance the network coverage of air quality monitoring data.

#### **Schedule of EPA's review of criteria pollutants in 2009- 2011:**

Primary SO<sub>2</sub> NAAQS- proposal submitted November 2009; final ruling anticipated June 2, 2010.  
Primary NO<sub>2</sub> NAAQS – proposal submitted June 2009; final ruling anticipated January 10, 2010.  
O<sub>3</sub> NAAQS- reconsideration proposal December, 2009; final ruling anticipated August 31, 2010.  
Secondary NO<sub>2</sub> and SO<sub>2</sub> NAAQS- proposal due February, 2010; final ruling anticipated October 19, 2010.  
Primary CO NAAQS – proposal due October, 2010; final ruling anticipated May 13, 2011.  
Particulate Matter NAAQS- proposal due January, 2011; final ruling anticipated October, 2011.

**PDEQ made the following network modifications in 2009:**

- ◆ Pima County changed the Saguaro Park ozone designation from Special Purpose (SP) monitor to a State or Local Air Monitoring Stations (SLAMS).
- ◆ Ozone, MET, trace CO, SO<sub>2</sub> and NO<sub>y</sub> instruments have been installed at the NCore Children's Park site.
- ◆ On 08/13/2009 the Downtown site was closed due to lack of funds to fix equipment needed to run the site, as well as generally having low levels of both CO and O<sub>3</sub>.

**Anticipated modifications to network in 2010:**

- ◆ Install a Lead monitor at the NCore Children's Park location with the intention to begin monitoring in January of 2011.
- ◆ Install a continuous Particulate Matter monitor and Relative Humidity monitor at the NCore Children's Park site.
- ◆ Begin submitting monitor data to EPA from the NCore Children's Park site.

## II. BACKGROUND

Pima County Air Quality Control District met all the National Ambient Air Quality Standards (NAAQS) in 2009. Concentrations of the criteria pollutants have been stable over the past few years with ozone and particulate matter (PM<sub>10</sub>) being the major concern for Pima County. Ozone has been very close to the standard, often within 95% of the standard. EPA has just lowered the standard further, bringing Pima County within 99% of the NAAQS. In 2009, there was one exceedance of the Particulate matter (PM<sub>10</sub>) standard at the South Tucson, Orange Grove and Geronimo locations on July 22<sup>nd</sup>, which did not constitute a violation of the standard. Pima County is submitting documentation for an exceptional event designation for these exceedances. Particulate Matter (PM<sub>10</sub>) levels are elevated during drought conditions and high winds which have caused exceedances of the NAAQS in previous years.

### Regional Evaluation

In order to evaluate existing and proposed monitoring stations and their stated objectives, regional information is used. The regional information consists of the most current values for population, major urban developments and directions of growth, traffic and highway data, major industries and aerial photographs showing topography. Population (census tract) data can act as a guide in evaluation of the representativeness of a site for determining population exposure. The Tucson metropolitan statistical area population is estimated at 1,012,018 for 2008. Tucson Core-Based Statistical Area (CBSA) for 2005 was 946,362. **Figure 1** on page 8 illustrates the Eastern Pima County Tucson Air Planning Area. The various incorporated areas and other agency lands are shown, as well as the named mountain peaks that define the planning area for Eastern Pima County, which includes the Tucson Metropolitan area.

### Average Daily Traffic (ADT)

Traffic data is necessary for site evaluations since a large portion of air pollutants in the Tucson basin are caused by vehicular traffic. Traffic volumes and density maps are used in evaluating the monitoring network. This data is routinely compiled and used by local transportation and planning agencies. An analysis of the most current traffic data indicates that the network continues to meet the requirements for the monitoring site type and corresponding spatial scales as initially established. The Average Daily Traffic (ADT) numbers are 24 - hour, two - way volume of averaged weekday traffic. Updated ADT numbers were not available for years 2008 and 2009.

### Latitude and Longitude

Latitude and Longitude data is also provided for the monitoring sites using Datum WGS84 AZ Central in Decimal.Degrees.

### Local Geography and Meteorology

Tucson, Arizona is a major metropolitan area situated in the Santa Cruz river valley, which is encompassed by the Sonoran Desert at an elevation between 2300 and 2800 feet. Basin and range topography characterizes the region with rugged mountain ranges encircling the valley floor with mountain peak elevations in excess of 9000 feet, thus delineating the Tucson Air Planning Area. The flat or gently rolling valley terrain slopes from the higher south and southeast toward the lower northwest following the Santa Cruz river drainage.

## **2009 Ambient Air Monitoring Network Plan**

The climate of Tucson is characterized by a hot season normally starting in April and ending in October, and a generally mild winter. Maximum daily temperatures from May through September are usually above 90 degrees Fahrenheit. The average rainfall is around eleven inches per year.

Tucson International Airport records show an average of 240 clear days a year (days with less than 50% total cloud cover). The remaining periods include the winter prefrontal situations more common in the north and the prolonged seasons of convective summer storms. Wind velocity and direction changes, associated with the large scale pressure systems, frequently result in localized dust storms.

The mountain-valley circulation, along with surface heating during the day and radiational cooling at night, create a predominantly southeast to northwest wind path in the basin. Airflows generally tend to be downvalley (from the southeast) at night and early morning hours, reversing to the upvalley direction (from the northwest) during the day. These downvalley / upvalley flows are strongly influenced by localized upslope / downslope terrain. The normal upvalley airflow is from the northwest, and parallels the Santa Cruz River, but decays well before sunset. This is followed by an hour of light, erratic flows which turn into the downvalley flow from the southeast, and reach their maximum and stabilized speed in four to six hours. The air temperature drops steadily during this interval until the sun rises. The downvalley direction continues for two to five hours past sunrise and then transforms into a short calm period prior to the change to upvalley flows.

The southeasterly “monsoon” regime that occurs primarily in the months of July and August is a large scale synoptic feature with considerable yearly variation both in intensity and timing. At the Tucson International Airport, the winds become strong, gusty and southeasterly with high relative humidity, cloud cover and frequent thunderstorms. The mountain – valley circulation tends to be suppressed during this time period.

Atmospheric temperature inversions occur almost daily in the Tucson air basin. During the winter months these inversions may become severe with particulate and other pollutants becoming concentrated, remaining near the ground level causing haze. When the sun sets, the ground and surface air cools faster than the air several hundred feet above the surface. Since air temperature normally decreases with increasing altitude, the warm and cool layers are reversed or “inverted”, hence the name ‘temperature inversion’. These temperature inversions are usually strongest on cold, clear winter nights, where there is an absence of cloud cover. Consequently, the inversions “lock” the pollutants near the surface. As the sun causes the cool air layer close to the ground to warm up, vertical mixing and horizontal transport disperse the air pollutants. In the early evening, the low level air inversion begins to form again and often coincides with the evening traffic rush hour.

## 2009 Ambient Air Monitoring Network Plan

### Definition of Monitoring Objectives, Site Types and Spatial Scales

The Pima County ambient air monitoring network is designed to meet three basic monitoring objectives. These objectives listed in **Appendix D, 1.1 of 40 CFR 58** are:

- ◆ To provide in a timely matter air pollution data to the general public;
- ◆ To comply with ambient air quality protocols and standards in order for data to be used for comparison to the NAAQS;
- ◆ To support research studies.

The monitoring stations which comprise the Pima County network are designed to meet at least one of six basic monitoring site types. As listed in **Appendix D, 1.1.1 of 40 CFR 58**, the site types:

- ◆ Determine the area of highest concentrations expected to occur in the network;
- ◆ Determine representative concentrations in areas of high population density;
- ◆ Determine the impact on ambient pollution levels of significant sources or source categories;
- ◆ Determine general background concentration levels;
- ◆ Determine the extent of regional pollution transport among populated areas;
- ◆ Determine the welfare – related impact in more rural and remote areas.

The link between general monitoring objectives, site types and the geographical location of a monitoring station is defined as the spatial scale of representativeness, and the relationship is indicated in **Table 1** (next page). The goal of each station is to represent a specific air parcel throughout which actual pollution concentrations are reasonably homogeneous. The spatial scales are defined in **Appendix D, 1.2 of 40 CFR 58** as follows:

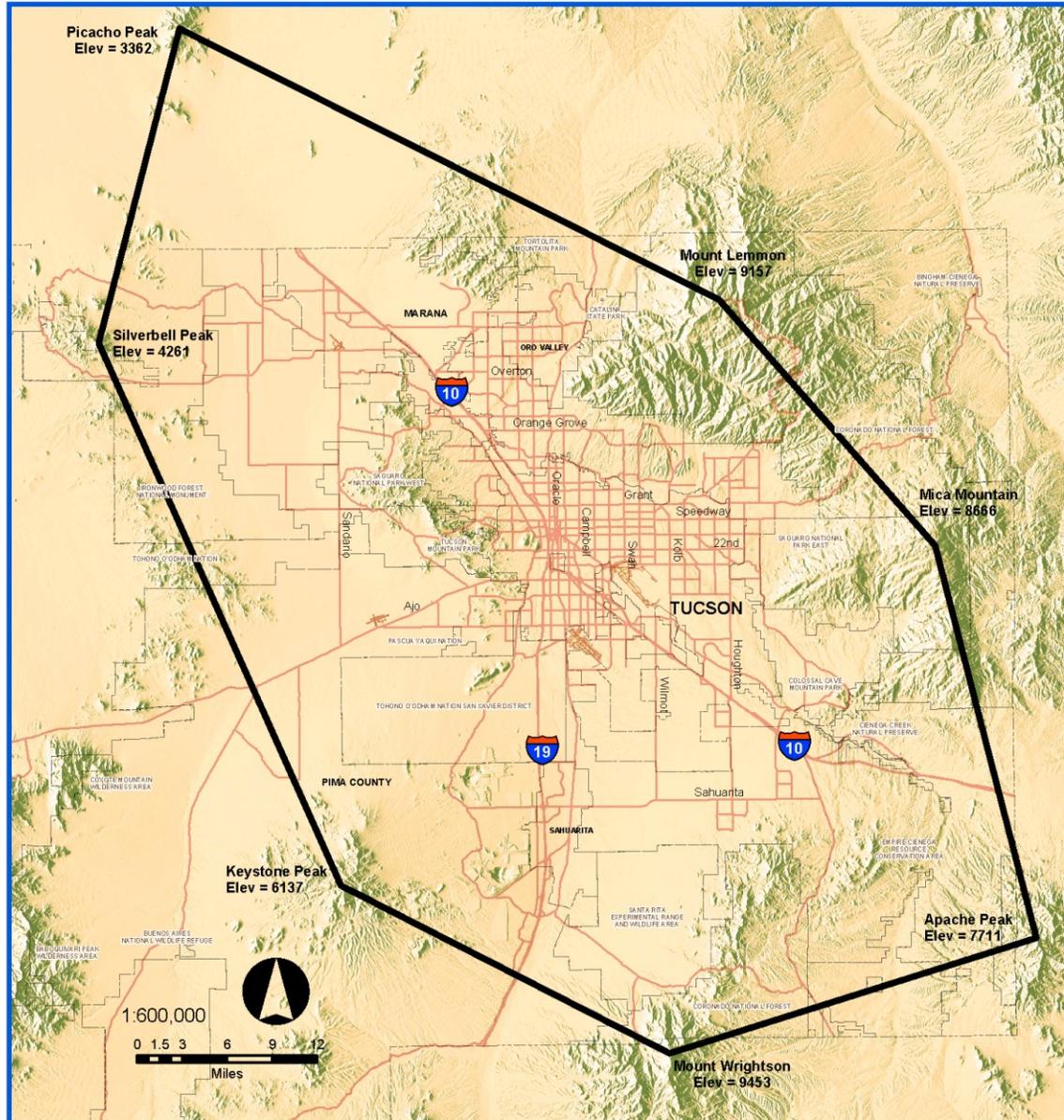
- ◆ *Microscale* defines concentrations in air volumes associated with area dimensions from 1 meter to 100 meters;
- ◆ *Middle Scale* defines concentrations typical of areas from 100 meters to 500 meters;
- ◆ *Neighborhood Scale* defines concentrations typical of areas with dimensions in the 0.5 to 4.0 kilometer range;
- ◆ *Urban Scale* defines the overall, city – wide conditions with dimensions in the 4 to 50 kilometer range;
- ◆ *Regional Scale* usually defines a rural area with dimensions as much as hundreds of kilometers;
- ◆ *National and Global Scales* represent concentrations which characterize nations and the globe as a whole (Pima County does not employ stations under this category).

**Table 1**

Monitoring Site Types	Appropriate Spatial Scales
Highest Concentration	Micro, Middle, Neighborhood, sometimes Urban
Population	Neighborhood, Urban
Source Impact	Micro, Middle, Neighborhood
General / Background	Urban, Regional
Regional Transport	Urban, Regional
Welfare-Related Impacts	Urban, Regional

# Eastern Pima Co. Tucson Air Planning Area

The portion of Pima County within  
the geographical coordinate boundary



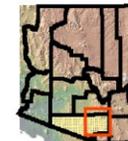
 TAPA Boundary  
 Major Streets

Revised: April 2010

Comments  
 All information is provided as is, with  
 all faults, and without warranty of any  
 kind, expressed or implied, including,  
 but not limited to, the implied warranties  
 of merchantability and fitness for a  
 particular purpose.



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 of  
 Environmental Quality



**III. PIMA COUNTY AIR QUALITY MONITORING NETWORK  
SUMMARY TABLES AND MAP**

**2009 Ambient Air Monitoring Network Plan**

Active Particulate Monitoring Sites for 2009

**Table 2**

<b>Map #</b>	<b>Pollutant</b>		<b>Address</b>	<b>Site Name</b>
4	PM <sub>10</sub>	PM <sub>2.5</sub>	2498 N. Geronimo	Geronimo
5	PM <sub>10</sub>		1601 S. 6 <sup>th</sup> Ave.	South Tucson
6	PM <sub>10</sub>		1016 W. Prince Rd.	Prince Road
7	PM <sub>10</sub>		4625 E. Broadway Blvd.	Broadway & Swan
8	PM <sub>10</sub>		22000 S. Houghton Rd.	Corona de Tucson
9	PM <sub>10</sub>		6910 S. Santa Clara Ave.	Santa Clara School
10	PM <sub>10</sub>	PM <sub>2.5</sub>	601 N. La Canada Dr.	Green Valley
11		PM <sub>2.5</sub>	400 W. River Rd.	Children's Park
12	PM <sub>10</sub>	PM <sub>2.5</sub>	3401 W. Orange Grove Rd.	Orange Grove
13	PM <sub>10</sub>		12101 N. Camino de Oeste	Tangerine
14		PM <sub>2.5</sub>	710 W. Michigan	Rose Elementary
15		PM <sub>2.5</sub>	9597 N. Coachline Blvd.	Coachline
	PM <sub>10</sub>	PM <sub>2.5</sub>	as studies require	Mobile 2

Map located on Page 11

## 2009 Ambient Air Monitoring Network Plan

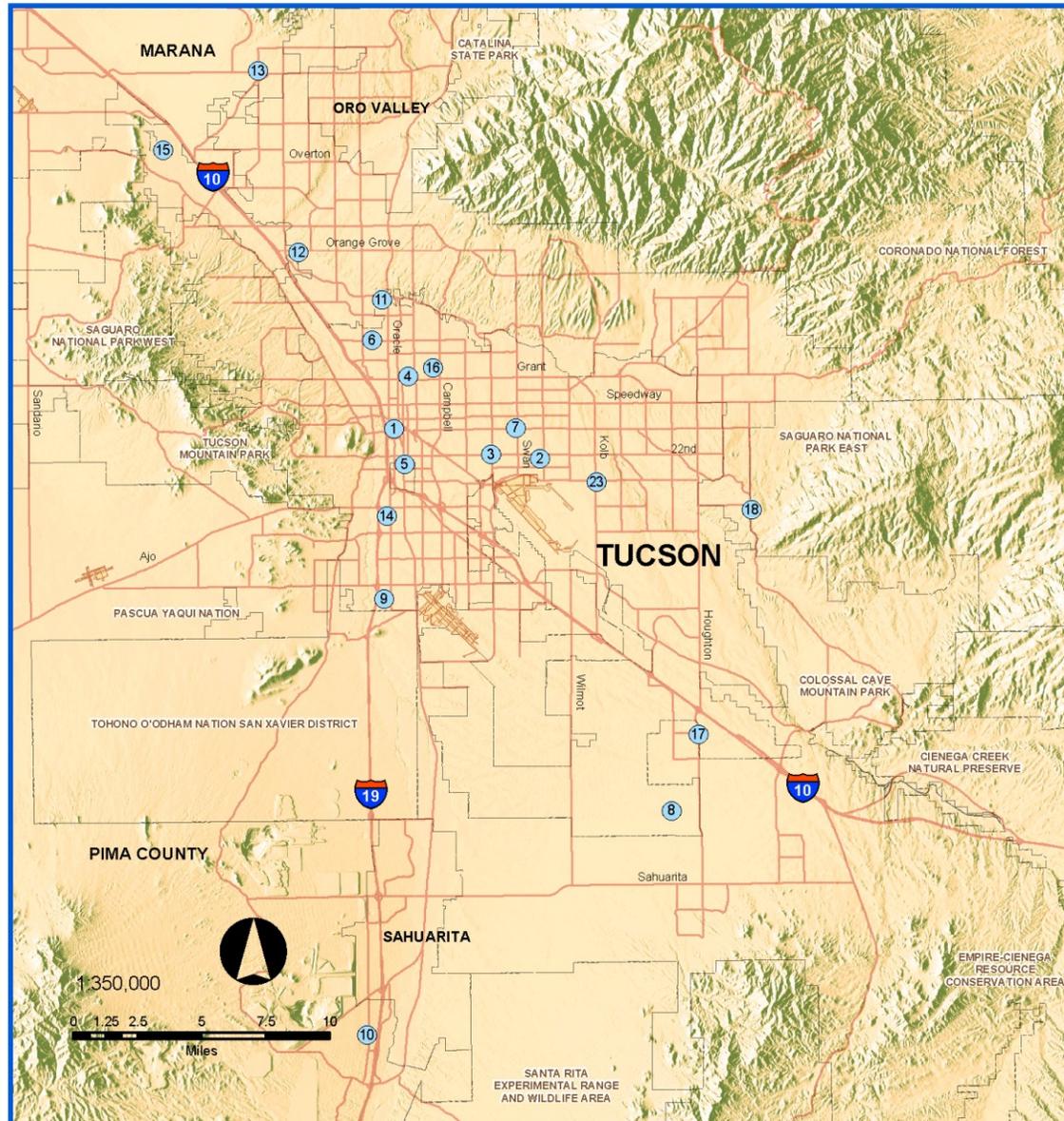
### Active Gaseous Pollutant Monitoring Sites for 2009

**Table 3**

Map #	Pollutant				Address	Site Name
1	CO	O <sub>3</sub>			190 W. Pennington St.	Downtown
2	CO	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	1237 S. Beverly Ave.	22 <sup>nd</sup> & Craycroft
3	CO				3895 E. 22 <sup>nd</sup> St.	22 <sup>nd</sup> & Alvernon
10		O <sub>3</sub>			601 N. La Canada Dr.	Green Valley
11	CO	O <sub>3</sub>		NO <sub>2</sub>	400 W. River Rd.	Children's Park
13		O <sub>3</sub>			12101 N. Camino de Oeste	Tangerine
14		O <sub>3</sub>			710 W. Michigan	Rose Elementary
15		O <sub>3</sub>			9597 N. Coachline Blvd.	Coachline
16	CO				2745 N. Cherry Ave.	Cherry & Glenn
17		O <sub>3</sub>			11330 S. Houghton Rd.	Fairgrounds
18		O <sub>3</sub>			3905 S. Old Spanish Trail	Saguaro National Park, East
23	CO				2601 S. Kolb Rd.	Golf Links & Kolb
	CO	O <sub>3</sub>			as studies require	Mobile 1 & 2

Map located on page 11

# Pima County Monitoring Sites



- 1 - Downtown
- 2 - 22nd / Craycroft
- 3 - 22nd / Alvernon
- 4 - Geronimo
- 5 - South Tucson
- 6 - Prince Road
- 7 - Broadway / Swan
- 8 - Corona de Tucson
- 9 - Santa Clara
- 10 - Green Valley
- 11 - Children's Park
- 12 - Orange Grove
- 13 - Tangerine
- 14 - Rose Elementary
- 15 - Coachline
- 16 - Cherry / Glenn
- 17 - Fairgrounds
- 18 - Saguario National Park East
- 23 - Golf Links / Kolb

- Major Streets
- Monitoring Sites

Revised: April 2010

**Comments**  
 All information is provided as is, with all faults, and without warranty of any kind, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

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 Environmental Quality



## 2009 Ambient Air Monitoring Network Summary Table

Table 4

### CARBON MONOXIDE - PIMA COUNTY MONITORING NETWORK

SITE NAME AND LOCATION	SITE ID (a)	PARAMETER (b)	CLASSIFICATION (c)	DATES (d)	METHOD (e)	ELEV. FEET (f)	SMPL HEIGHT (M) (g)	SPATIAL SCALE (h)	SMPL FREQ (i)	POC (j)	MONITORING SITE TYPE (h)
DOWNTOWN 190 W. PENNINGTON	004-019-0002	42101	SP	Jan-73 Aug-09 CLOSED	54	2365	8.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
22ND & CRAYCROFT 1237 S. BEVERLY AVE.	004-019-1011	42101	SLAMS	Jul-73 PRESENT	54	2582	4.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
22ND & ALVERNON 3895 E.22ND STREET	004-019-1014	42101	SLAMS	Mar-75 PRESENT	54	2516	3.4	MICROSCALE	CONTINUOUS	1	HIGHEST CONCENTRATION
CHILDREN'S PARK 400 W. RIVER ROAD	004-019-1028	42101	SP	Oct-98 PRESENT	088/054/093	2286	4.25	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
CHERRY & GLENN 2745 N. CHERRY AVE.	004-019-1021	42101	SP	Feb-89 March-09 CLOSED	54	2400	4.9	NEIGHBORHOOD	Cont/Seasonal Jan. 1 – March 31 Oct. 1- Dec. 31	1	POPULATION EXPOSURE
GOLF LINKS & KOLB 2601 SOUTH KOLB	004-019-1031	42101	SP	Sept-02 PRESENT	093/054	2661	3	MICROSCALE	Cont/Seasonal Jan. 1 – March31 Oct. 1- Dec. 31	1	HIGHEST CONCENTRATION

### NITROGEN DIOXIDE - PIMA COUNTY MONITORING NETWORK

SITE NAME AND LOCATION	SITE ID (a)	PARAMETER (b)	CLASSIFICATION (c)	DATES (d)	METHOD (e)	ELEV. FEET (f)	SMPL HEIGHT (M) (g)	SPATIAL SCALE (h)	SMPL FREQ (i)	POC (j)	MONITORING SITE TYPE (h)
22ND & CRAYCROFT 1237 S. BEVERLY AVE.	004-019-1011	42602	SLAMS	Jan-73 PRESENT	74	2582	4.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
CHILDREN'S PARK 400 W. RIVER ROAD	004-019-1028	42602	SP	May-98 PRESENT	099	2286	4.25	URBAN	CONTINUOUS	1	HIGHEST CONCENTRATION

Key located on page 15

**2009 Ambient Air Monitoring Network Summary Table  
SULFUR DIOXIDE -PIMA COUNTY MONITORING NETWORK**

SITE NAME AND LOCATION	SITE ID (a)	PARAMETER (b)	CLASSIFICATION (c)	DATES (d)	METHOD (e)	ELEV. FEET (f)	SMPL HEIGHT (M) (g)	SPATIAL SCALE (h)	SMPL FREQ (i)	POC (j)	MONITORING SITE TYPE (h)
22ND & CRAYCROFT 1237 S. BEVERLY AVE.	004-019-1011	42401	SLAMS	Jul-73  PRESENT	60	2582	4.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE

**OZONE - PIMA COUNTY MONITORING NETWORK**

SITE NAME AND LOCATION	SITE ID (a)	PARAMETER (b)	CLASSIFICATION (c)	DATES (d)	METHOD (e)	ELEV. FEET (f)	SMPL HEIGHT (M) (g)	SPATIAL SCALE (h)	SMPL FREQ (i)	POC (j)	MONITORING SITE TYPE (h)
DOWNTOWN 190 W. PENNINGTON ST.	004-019-0002	44201	SP	Jan-72 Aug-09 CLOSED	047 /087	2385	8.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
22ND & CRAYCROFT 1237 S. BEVERLY AVE.	004-019-1011	44201	SLAMS	Jul-73  PRESENT	087	2582	4.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
GREEN VALLEY 601 N. LA CANADA DR.	004-019-1030	44201	SP	July-03  PRESENT	047	2910	3.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
CHILDREN'S PARK 400 W. RIVER ROAD	004-019-1028	44201	SLAMS	Sep-97  PRESENT	047	2286	4.25	URBAN	CONTINUOUS	1	POPULATION EXPOSURE
TANGERINE 12101 N. CAMINO DE OESTE	004-019-1018	44201	SP	Oct-89  PRESENT	047	2638	3.75	URBAN	CONTINUOUS	1	HIGHEST CONCENTRATION
ROSE ELEMENTARY 710 W. MICHIGAN	004-019-1032	44201	SP	July-03  PRESENT	087	2387	4.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
COACHLINE 9597 N. COACHLINE BLVD	004-019-1034	44201	SP	July-03  PRESENT	087	2110	3.1	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
FAIRGROUNDS 11330 S. HOUGHTON RD.	004-019-1020	44201	SP	Oct-89  PRESENT	047	3078	3.6	URBAN	CONTINUOUS	1	NATURAL BACKGROUND
SAGUARO NATIONAL PARK 3905 S. OLD SPANISH TRAIL	004-019-0021	44201	SLAMS	Jun-82  PRESENT	047	3089	4.1	NEIGHBORHOOD	CONTINUOUS	1	HIGHEST CONCENTRATION

Key located on page 15

**2009 Ambient Air Monitoring Network Summary Table**  
**PM10- PIMA COUNTY MONITORING NETWORK**

SITE NAME AND LOCATION	SITE ID (a)	PARAMETER (b)	CLASSIFICATION (c)	DATES (d)	METHOD (e)	ELEV. FEET (f)	SMPL HEIGHT (M) (g)	SPATIAL SCALE (h)	SMPL FREQ (i)	POC (j)	MONITORING SITE TYPE (h)
GERONIMO 2498 N. GERONIMO	04-019-1113	81102	SP	June- 07	079	2452	4.6	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
SOUTH TUCSON 1601 S. 6TH AVE.	04-019-1001	81102	SLAMS	Sep-88 PRESENT	127	2420	6.9	NEIGHBORHOOD	1 DAY collocated every 6 day	1	POPULATION EXPOSURE
PRINCE ROAD 1016 W. PRINCE RD.	04-019-1009	81102	SLAMS	Jul-87 PRESENT	126	2315	4.6	MICROSCALE	6 DAY	1	SOURCE IMPACT
BROADWAY/SWAN 4625 E. BROADWAY BLVD	04-019-1023	81102	SP	Jun-90 PRESENT	126	2532	8.8	NEIGHBORHOOD	6 DAY	1	SOURCE IMPACT
CORONA DE TUCSON 22000 S. HOUGHTON RD.	04-019-0008	81102	SLAMS	Mar-87 PRESENT	126	3078	2.1	REGIONAL	6 DAY	1	BACKGROUND
SANTA CLARA 6910 S. SANTA CLARA AVE.	04-019-1026	81102	SP	Jul-94 PRESENT	126	2540	6.45	NEIGHBORHOOD	6 DAY	1	POPULATION EXPOSURE
GREEN VALLEY 601 N. LA CANADA DR.	04-019-1030	81102	SP	Feb-01 PRESENT	122/079	2910	4.8	NEIGHBORHOOD	CONTINUOUS	1	POPULATION EXPOSURE
ORANGE GROVE 3401 W. ORANGE GROVE RD.	04-019-0011	81102	SLAMS	Jan-85 PRESENT	127	2234	2.65	NEIGHBORHOOD	1 DAY collocated every 6 day	2	HIGHEST CONCENTRATION
TANGERINE 12101 N. CAMINO DE OESTE	04-019-1018	81102	SP	Jan-94 PRESENT	126	2638	4.5	URBAN	6 DAY	1	BACKGROUND

Key located on page 15

## 2009 Ambient Air Monitoring Network Summary Table

### PM2.5- PIMA COUNTY MONITORING NETWORK

SITE NAME AND LOCATION	SITE ID (a)	PARAMETER (b)	CLASSIFICATION (c)	DATES (d)	METHOD (e)	ELEV. FEET (f)	SMPL HEIGHT (M) (g)	SPATIAL SCALE (h)	SMPL FREQ (i)	POC (j)	MONITORING SITE TYPE (h)
GERONIMO 2498 N. GERONIMO	004-019-1113	88501	SP	July-03 PRESENT	731	2452	4.6	NEIGHBORHOOD	CONTINUOUS	3	POPULATION EXPOSURE
GREEN VALLEY 601 N. LA CANADA DR.	004-019-1030	88501	SP	July-03 PRESENT	731	2910	4.8	NEIGHBORHOOD	CONTINUOUS	3	POPULATION EXPOSURE
CHILDREN'S PARK 400 W. RIVER ROAD	004-019-1028	88101	SLAMS	Jan-99 PRESENT	118	2286	3.1	NEIGHBORHOOD	3 DAY collocated every 12 day	1	POPULATION EXPOSURE
CHILDREN'S PARK 400 W. RIVER ROAD	004-019-1028	88502	SP SPECIATION	Feb-02 PRESENT	810	2286	3.0		6 DAY	5	POPULATION EXPOSURE
ORANGE GROVE 3401 W. ORANGE GROVE RD.	004-019-0011	88101	SLAMS	Jan-99 PRESENT	118	2234	2.65	NEIGHBORHOOD	3 DAY	1	POPULATION EXPOSURE
ROSE ELEMENTARY 710 W. MICHIGAN	004-019-1032	88501	SP	July-03 PRESENT	731	2387	4.9	NEIGHBORHOOD	CONTINUOUS	3	POPULATION EXPOSURE
COACHLINE 9597 N. COACHLINE BLVD	004-019-1034	88501	SP	July-03 PRESENT	731	2100	4.9	NEIGHBORHOOD	CONTINUOUS	3	POPULATION EXPOSURE

Key:

- a - Site ID - site identification code used in the AQS database
- b - Parameter - code used in the AQS database to describe the pollutant monitored
- c - Classification – described on page 2
- d - Dates - dates sampling began and ended
- e - Method - code used in the AQS database indicating the type of instrument used
- f - Elev. feet - site elevation in feet
- g - SPL (M) Height - sample inlet height in meters, specific height range required for uniform collection
- h - Spatial Scale and Monitoring site type - described on page 6
- i - SMPL Freq - frequency of sampling days
- j - POC - parameter occurrence code used to distinguish between two or more instruments measuring the same parameter at the same time

Information provided based on EPA'S 2009 Air Quality System (AQS) data.

## IV. CURRENT MONITORING NETWORK EVALUATIONS

### PM<sub>10</sub> MONITORING NETWORK

#### 2009 Ambient Air Monitoring Network Plan

The PDEQ PM<sub>10</sub> network consists of nine monitoring sites in eastern Pima County, Arizona. The 2009 network used several different types of PM<sub>10</sub> samplers: R& P Partisol 2000, R& P Partisol-Plus 2025 Sequential, TEOM 1400 and the Met One Beta Attenuation 1020. **40 CFR 58, app. D, 4.6** Particulate matter (PM<sub>10</sub>) design criteria, provided guidance in determining the minimum number of required PM<sub>10</sub> SLAMS sites for 2009. The population is 843,746 for the Tucson, Arizona Metropolitan Statistical Area (MSA). The estimated population for 2008 was 1,012,018.

#### 2009 PM<sub>10</sub> Design Criteria

Table 5

MSA Population Category	Medium Concentration Area <sup>1</sup>	# of PM <sub>10</sub> Monitors
500,000 – 1,000,000	Requires 2-4 SLAMS monitors	4 SLAMS monitors
500,000 – 1,000,000	No requirement for SP	5 SP monitors

<sup>1</sup> Medium concentration ambient PM<sub>10</sub> data show ambient concentrations less than 80 % of the PM<sub>10</sub> NAAQS.

#### Violation History

The PM<sub>10</sub> 24 hour standard remains at 150 µg/m<sup>3</sup>. Since the promulgation of the PM<sub>10</sub> standard, July 31, 1987, exceedances of the 24 hour standard have been recorded at monitoring sites in the PDEQ PM<sub>10</sub> network. The Orange Grove site recorded two exceedances of the NAAQS during the 4<sup>th</sup> quarter of 1988 and the Downtown site recorded three during the 2<sup>nd</sup> quarter of 1989 (Downtown site was discontinued, September 1999). In 1999, the PM<sub>10</sub> standard was violated with four recorded exceedances at the Orange Grove location and two exceedances at the South Tucson location. Subsequently, the monitoring schedules for the Orange Grove and South Tucson locations have been changed from every six day sampling to every day sampling, as indicated in **40 CFR 50, app. K** and **40 CFR 58.13**. In 2002 and 2003 there were a total of two exceedances at the Orange Grove location and two exceedances at the South Tucson location. These exceedances do not constitute a violation of the standard. In 2008, there was one exceedance of the standard at the Santa Clara site, which is in the process of an Exceptional Event designation dependant on approval from EPA. In 2009 there was one exceedance at the Orange Grove, South Tucson and Geronimo locations on July 22<sup>nd</sup>, these exceedances may also be considered as an Exceptional Event dependant on approval from EPA.

#### Quality Assurance for Particulate Matter PM<sub>10</sub>

All data quality assessment requirements, as outlined in **40 CFR 58, app. A**, have been met for 2009. The precision of PM<sub>10</sub> data is derived from the co-located PM<sub>10</sub> samplers at the South Tucson and Orange Grove sites; the difference in concentration between the two samplers running side-by-side is used to calculate the precision of the data. At the end of each calendar quarter, a combined precision probability interval for monitors is calculated by EPA.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

The accuracy of PM<sub>10</sub> sampling is assessed by auditing the flow rate of at least 25% of the samplers each calendar quarter, such that each sampler is audited at least once per year. The difference in the flow rate between the audit flow measurement and the flow indicated by the sampler is used to calculate accuracy.

A combined accuracy probability interval is calculated for PM<sub>10</sub> along with separate probability limits for each audit concentration level for automated analyzers, and reported to EPA quarterly.

**Table 6**

<b>Protocol</b>	<b>Instrument</b>	<b>Frequency</b>	<b>Date Completed 2009</b>
Flow rate verification	Met One BAM 1020 <b>R&amp;P TEOM 1400</b>	Weekly	
Flow Rate Audit	Met One BAM 1020	Quarterly	Green Valley 02/03, 06/23, 09/02, 12/14 <b>Geronimo 02/04, 06/22, 09/01, 12/10</b>
Flow rate verification	R& P Partisol 2000, R& P Partisol-Plus 2025 Sequential	Monthly	
Flow Rate Audit	R& P Partisol 2000, R& P Partisol-Plus 2025 Sequential	Quarterly	Broadway & Swan 03/06, 06/26, 09/23, 12/07 <b>Corona de Tucson 03/06, 06/19, 08/31, 11/10</b> Santa Clara 02/03, 05/05, 09/02, 12/14 Prince Road 03/18, 05/04, 09/01, 12/10 Tangerine 02/09, 06/22, 09/01, 12/22 South Tucson 02/03, 05/29, 09/04, 12/11 South Tucson (co-located) 02/03, 05/29, 09/04, 12/11 Orange Grove 02/09, 05/04, 09/02, 12/11 Orange Grove (co-located) 02/09, 05/04, 09/02, 12/11

#### Particulate Matter Weigh Lab

Pima County Department of Environmental Quality operates a filter weigh lab for the processing of Pima County's PM<sub>10</sub> and PM<sub>2.5</sub> network filters, excluding PM<sub>2.5</sub> speciation filters. This weigh lab follows all requirements set forth in **Appendix L of 40 CFR 50**.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>GREEN VALLEY</b>	
<b>AQS code:</b>	040191030	
<b>Address:</b>	601 N. La Canada Drive, Green Valley, AZ	
<b>Latitude/ Longitude:</b>	31.87952 / -110.996440	
<b>Elevation:</b>	2910	
<b>Method:</b>	122 ; 079	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Met One Beta Attenuation 1020 ; Thermo Scientific TEOM 1400AB	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	354	
<b>Annual arithmetic mean:</b>	17.2 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0	
<b>Sampling frequency:</b>	Every day	
<b>Probe height:</b>	4.25 meters above the ground of the Pima County Government Center.	
<b>Surrounding landscape:</b>	Dirt, sparse desert vegetation	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a residential / commercial area. Open pit copper mines and tailings ponds are located four kilometers to the west of the community.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	100 meters west of La Canada /2006 ADT of 15,200
	<b>2</b>	0.5 kilometers west of Interstate 19 /2006 ADT of 30,000
<b>Site meets 40 CFR 58, Appx.</b>	Yes	

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### GREEN VALLEY: AIRS # 040191030



**Annual summary statistics:** NAAQS: 150  $\mu\text{g}/\text{m}^3$  24- Hour Average.

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>14</b>	<b>18</b>	<b>18</b>	<b>20</b>	<b>17.2</b>	<b>84</b>	<b>78</b>

**Comments:** This site is fifty kilometers south of Downtown Tucson in the retirement community of Green Valley. PM<sub>10</sub> monitoring commenced in September 1989 at the established TSP site there. ASARCO and Freeport-McMoRan operate several open pit mines and tailings ponds just west of the community. The monitoring objective is to monitor the impact of this potentially significant source of airborne particulates. The monitor was relocated in February 2001, approximately 1 kilometer north of the original Esperanza site, to the Pima County Government Center at 601 N. La Canada Drive. The move was necessitated by warranty requirements of the new roof at the original site and a request by the property management firm to vacate. The new site is considered a continuation of the original site. PM<sub>10</sub> levels were below the health standards in the years 1989 through 2009.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>CORONA de TUCSON</b>		
<b>AQS code:</b>	040190008		
<b>Address:</b>	22001 S. Houghton Road, Tucson, AZ		
<b>Latitude/ Longitude:</b>	32.00474 / -110.79260		
<b>Elevation:</b>	3078		
<b>Method:</b>	126		
<b>Number of monitors:</b>	1		
<b>Type of monitor:</b>	R&P 2000		
<b>Monitoring site type:</b>	Determine natural desert (background) concentrations		
<b>Classification:</b>	SLAMS		
<b>Scale:</b>	Regional		
<b>Number of daily observations:</b>	60		
<b>Annual arithmetic mean:</b>	18.4 µg/m <sup>3</sup>		
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0		
<b>Sampling frequency:</b>	Every sixth day		
<b>Probe height:</b>	2.1 meters		
<b>Surrounding landscape:</b>	Gravel within enclosure; dirt, sparse desert vegetation surrounding		
<b>Degrees of unrestricted air flow:</b>	360		
<b>Location description:</b>	This site is situated in an undisturbed natural desert area.		
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	1.6 kilometers west of Houghton Road with a 2006 ADT of 8,000.	
	<b>2</b>		
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes		

**Annual summary statistics: NAAQS: 150 µg/m<sup>3</sup> 24- Hour Average.**

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>18</b>	<b>23</b>	<b>15</b>	<b>17</b>	<b>18.4</b>	<b>85</b>	<b>52</b>

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**CORONA de TUCSON: AIRS # 040190008**



**Comments:** This site is the only regional scale monitor in the network. PM<sub>10</sub> sampling was started here in September 1988, in conjunction with existing total suspended particulates (TSP) sampling. This site exhibits the lowest network concentrations. TSP sampling was discontinued in May 1989. Hi - Vol sampling for PM<sub>10</sub> was substituted with dichotomous sampling during the last quarter of 1989 in support of the state sponsored Tucson PM<sub>10</sub> Source Apportionment Study. Hi - Vol PM<sub>10</sub> sampling resumed in January 1990. Low -Vol PM<sub>10</sub> R& P 2000 sampling began in March, 2006.

**PM<sub>10</sub> MONITORING NETWORK**  
**2009 Ambient Air Monitoring Network Plan**

<b>Site Name:</b>	<b>ORANGE GROVE</b>	
<b>AQS code:</b>	040190011	
<b>Address:</b>	3401 W. Orange Grove Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.32255 / -111.037700	
<b>Elevation:</b>	2234	
<b>Method:</b>	127	
<b>Number of monitors:</b>	2	
<b>Type of monitor:</b>	R&P 2025 Sequential	
<b>Monitoring site type:</b>	Highest Concentration	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	362	
<b>Annual arithmetic mean:</b>	27.0 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	One exceedance on 07/22/2009	
<b>Historical exceedances:</b>	Exceedances of the 24 – hour standard: two in 1988, four in 1999, one in 2002, one in 2003, one in 2009	
<b>Sampling frequency:</b>	The sampling frequency started out with every other day sampling. It was changed to daily after the exceedance in July 1985. The sampling frequency remained as daily until the end of 1986. Every other day sampling was resumed until the two exceedances were recorded in the fourth quarter 1988. Every day sampling was immediately initiated and continued until April 1991 when every other day sampling was resumed. The site was placed on every sixth day sampling in October 1993. The exceedances of the NAAQS in 1999 commenced everyday sampling on September 9, 1999.	
<b>Collocated Monitor:</b>	Every day ; reported every 6 <sup>th</sup> day	
<b>Probe height:</b>	2.65 meters above the ground in a city water well site	
<b>Distance between collocated monitors:</b>	1.2m	
<b>Surrounding landscape:</b>	Gravel in fenced compound, dirt road shoulders, weeds	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	This site is situated in a residential area with light commerce and industry. There is an asphalt batch plant with a large gravel pit less than three kilometers to the west of the site in the Santa Cruz River bed area.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	37 meters west of Camino de la Tierra and 70 meters south of Orange Grove Road with a 2007 ADT of 22,000
	<b>2</b>	2 kilometers east of Interstate 10 with a 2006 ADT of 105,000
<b>Site meets 40 CFR 58, Appx. A.C.D.E</b>	Yes	

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### ORANGE GROVE: AIRS # 040190011



**Annual summary statistics:** NAAQS:150  $\mu\text{g}/\text{m}^3$  24- Hour Average.

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>26</b>	<b>24</b>	<b>24</b>	<b>34</b>	<b>27.0</b>	<b>270</b>	<b>97</b>

**Comments:** Established in February 1985, this site is the oldest of the PM<sub>10</sub> monitoring sites in the network. Orange Grove was chosen as the initial PM<sub>10</sub> monitoring site and the design value site for Group II in the Tucson air planning area based on historically high TSP data. This neighborhood scale site is located near the confluence of the Santa Cruz, Rillito, and Canada del Oro Rivers in the Tucson Valley. This site is situated near the freeway and railway tracks, and in the vicinity of major construction projects, therefore high PM<sub>10</sub> values are expected here. Dichotomous sampling was started at this site in July of 1993. The dichotomous ran in co-location with a HI-VOL- SA/1200 model from 1993 to 1996. The site was converted to dichotomous only operations on October 1, 1996 continuing until December 1998. Hi-Vol sampling resumed in January 1999, but was replaced with co-located low volume sequential samplers in 2004.

**PM<sub>10</sub> MONITORING NETWORK**

**2009 Ambient Air Monitoring Network Plan**

<b>Site Name:</b>	<b>SOUTH TUCSON</b>	
<b>AQS code:</b>	040191001	
<b>Address:</b>	1601 S. 6 <sup>th</sup> Avenue, South Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.20195 / -110.967900	
<b>Elevation:</b>	2420	
<b>Method:</b>	127	
<b>Number of monitors:</b>	2	
<b>Type of monitor:</b>	R&P 2025 Sequential	
<b>Monitoring objective:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	357	
<b>Annual arithmetic mean:</b>	30.1 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	One exceedance on 07/22/2009	
<b>Historical exceedances:</b>	Exceedances of the 24 – hour standard: two in 1999; two in 2002; one in 2009	
<b>Sampling frequency:</b>	The exceedances of the NAAQS in 1999 commenced everyday sampling on June 23, 1999.	
<b>Collocated Monitor:</b>	Every day; reported every 6 <sup>th</sup> day	
<b>Probe height:</b>	6.9 meters above the ground on the roof of the South Tucson Governmental Complex Building.	
<b>Distance between collocated monitors:</b>	1.7m	
<b>Surrounding landscape:</b>	Roof, gravel and desert landscaping surrounding building	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a dense residential / commercial area. There are numerous unpaved alleys and lots in the vicinity.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	41 meters east of South 6 <sup>th</sup> Avenue with a 2005 ADT of 21,000
	<b>2</b>	south of 22 <sup>nd</sup> Street with a 2004 ADT of 34,000
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### SOUTH TUCSON: AIRS # 040191001



**Annual summary statistics:** NAAQS: 150 µg/m<sup>3</sup> 24- Hour Average.

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>30</b>	<b>28</b>	<b>25</b>	<b>37</b>	<b>30.1</b>	<b>184</b>	<b>127</b>

**Comments:** From January 1985 to September 1988 this site approached or exceeded TSP standards. PM<sub>10</sub> sampling began here in September 1988. On March 8, 1993, the samplers were relocated from the original site to the new South Tucson Governmental Complex, which is less than two blocks north and across S. 6<sup>th</sup> Avenue. Levels at this location are representative of area - wide emissions patterns with high population exposure. The annual means for 1989 through 1999 were below the health standard. The 24 - hour NAAQS was exceeded twice in 1999 and 2002. Two co-located PM<sub>10</sub> samplers have been operational at this site from June 1991 to June 1999. Co-location of the PM<sub>10</sub> samplers was discontinued when a third sampler was added and everyday sampling began on June 23, 1999. In March, 2004, the Hi - Vol samplers were replaced with co-located Low -Vol sequential samplers.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>PRINCE ROAD</b>	
<b>AQS code:</b>	040191009	
<b>Address:</b>	1016 W. Prince Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.272300 / -110.989100	
<b>Elevation:</b>	2315	
<b>Method:</b>	126	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	R&P 2000	
<b>Monitoring objective:</b>	Source Impact	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Microscale	
<b>Number of daily observations:</b>	61	
<b>Annual arithmetic mean:</b>	32.6 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2006:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Every sixth day	
<b>Probe height:</b>	4.6 meters above the ground on the roof of a small commercial building.	
<b>Surrounding landscape:</b>	Roof, paved parking lots street surrounding building	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a dense residential / commercial area. Numerous unpaved alleys and lots are in the vicinity.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	14.1 meters north of Prince Road with a 2007 ADT of 24,000
	<b>2</b>	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics:** NAAQS: 150 µg/m<sup>3</sup> 24- Hour Average.

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>37</b>	<b>33</b>	<b>21</b>	<b>40</b>	<b>32.6</b>	<b>81</b>	<b>75</b>

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### PRINCE ROAD: AIRS # 040191009



**Comments:** This site is located in a homogenous, dense, residential / commercial area in north central Tucson. PM<sub>10</sub> sampling began here in August 1987. The site is representative of a neighborhood scale in the north central region of the air planning area where particulate levels are generally higher due to the low altitude and the prevailing southeasterly winds. The annual standard was exceeded in 1989. Power problems within the building resulted in an unusually low data recovery during the fourth quarter of 1990. Data recovery was again compromised by power problems in the 1<sup>st</sup> and 3<sup>rd</sup> quarters of 1997 and by damage to the sampler due to a storm in July, 2005. In March, 2006, the Hi -Vol sampler was replaced with a Low -Vol PM<sub>10</sub> R& P 2000 sampler.

**PM<sub>10</sub> MONITORING NETWORK**

**2009 Ambient Air Monitoring Network Plan**

<b>Site Name:</b>	<b>BROADWAY &amp; SWAN</b>	
<b>AQS code:</b>	040191023	
<b>Address:</b>	4625 E. Broadway Boulevard, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.222100 / -110.893800	
<b>Elevation:</b>	2532	
<b>Method:</b>	126	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	HI-VOL-SA/GMW-1200 ; R&P 2000	
<b>Monitoring objective:</b>	Source Impact	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	59	
<b>Annual arithmetic mean:</b>	23.9 $\mu\text{g}/\text{m}^3$	
<b>Number /dates of 24-hour standard exceedances in 2006:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Every sixth day	
<b>Probe height:</b>	This sampler inlet is 8.8 meters above the ground on the roof of the office building at 4625 E. Broadway Blvd	
<b>Surrounding landscape:</b>	Roof, paved parking lots and streets surrounding building	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a dense residential / commercial area	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	41 meters north of East Broadway Boulevard with a 2004 ADT of 49,500
	<b>2</b>	114 meters west of Swan Road with a 2004 ADT of 42,500
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics: NAAQS: 150  $\mu\text{g}/\text{m}^3$  24- Hour Average.**

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>24</b>	<b>21</b>	<b>21</b>	<b>29</b>	<b>23.9</b>	<b>67</b>	<b>52</b>

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**BROADWAY & SWAN: AIRS # 040191023**



**Comments:** In August of 1990 this site was relocated from an adjacent building. In May 2006, the co-located sampler was retired and the Hi-Vol sampler was replaced with a Low-Vol R&P 2000 sampler.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>SANTA CLARA SCHOOL</b>	
<b>AQS code:</b>	040191026	
<b>Address:</b>	6910 S. Santa Clara Avenue, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.125950 / -110.982600	
<b>Elevation:</b>	2540	
<b>Method:</b>	126	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	R&P 2000	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	61	
<b>Annual arithmetic mean:</b>	26.5 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	Exceedances of the 24 – hour standard: One on 10/27/2008	
<b>Sampling frequency:</b>	Every sixth day	
<b>Probe height:</b>	6.45 meters above the ground on the roof of the Santa Clara Elementary School.	
<b>Surrounding landscape:</b>	Roof, paved parking lots and streets, grass playground	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a Southwest Tucson residential district.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	1	450 meters east of Interstate 19 with a 2006 ADT of 60,000
	2	800 meters south of Valencia Road with a 2005 ADT of 51,600
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics:** NAAQS: 150 µg/m<sup>3</sup> 24-Hour Average.

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>27</b>	<b>27</b>	<b>22</b>	<b>30</b>	<b>26.5</b>	<b>90</b>	<b>48</b>

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**SANTA CLARA SCHOOL: AIRS # 040191026**



**Comments:** This site is located south of Interstate 10 and east of Interstate 19 and provides a representative neighborhood scale site on Tucson's south side. Being near the fringe of the city limits, this site should track transport values that develop with a southerly wind from a combination of desert, agricultural land, and silt flood plain that is found on the Tohono O'Odham Indian Reservation (San Xavier district) 500 meters south of the site. The Hi- Vol sampler was replaced in April, 2006, with a Low- Vol sampler.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>TANGERINE</b>	
<b>AQS code:</b>	040191018	
<b>Address:</b>	12101 N. Camino de Oeste, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.425250 / -111.063500	
<b>Elevation:</b>	2638	
<b>Method:</b>	126	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	R&P 2000	
<b>Monitoring site type:</b>	Background	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Urban	
<b>Number of daily observations:</b>	60	
<b>Annual arithmetic mean:</b>	18.1 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Every sixth day	
<b>Probe height:</b>	4.5 meters above the ground on a shelter on Tucson's far northwest side	
<b>Surrounding landscape:</b>	Dirt, sparse desert vegetation	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site has been situated in a relatively undisturbed natural desert area for most of it's existence, but residential development in recent years have been built to within 2 kilometers to the northwest, and low density residential developments are encroaching from the south, east and north to within 3 kilometers to 5 kilometers.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	Tangerine Road runs approximately east – west 70 meters south of the site with a 2005 ADT of 8,000
	<b>2</b>	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics: NAAQS: 150 µg/m<sup>3</sup> 24- Hour Average.**

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>14</b>	<b>19</b>	<b>16</b>	<b>23</b>	<b>18.1</b>	<b>101</b>	<b>41</b>

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**TANGERINE:** AIRS # 040191018



**Comments:** The primary objective of this site is to assess background concentrations and to assess transport impact from outlying sources during exceptional wind events. As part of the urban haze/visibility study, dichotomous samplers were installed at this site in July 1993. PM<sub>10</sub> data from these samplers was used to supplement the existing PM<sub>10</sub> network from October 1996 to December 1998, when the dichotomous samplers were relocated and a Hi-Vol sampler was installed to continue PM<sub>10</sub> monitoring. In 2005, the Hi-Vol PM<sub>10</sub> sampler was replaced with a Low –Vol R& P 2000 sampler.

## PM<sub>10</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>GERONIMO</b>	
<b>AQS code:</b>	040191113	
<b>Address:</b>	2498 N. Geronimo Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.251840 / -110.965300	
<b>Elevation:</b>	2452	
<b>Method:</b>	079	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	R & P TEOM	
<b>Monitoring site type:</b>	Special Purpose	
<b>Classification:</b>	Population Exposure	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	360	
<b>Annual arithmetic mean:</b>	31.3 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	One exceedance on 7/22/2009	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Every day; Hourly	
<b>Probe height:</b>	4.6m	
<b>Surrounding landscape:</b>	Dirt, dead shrubs, unpaved road shoulders	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a residential area in a City of Tucson water well site.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	1	one block south of Grant Road (2006 ADT 43,000)
	2	three blocks east of Stone Avenue (2007 ADT 24,700)
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics: NAAQS: 150 µg/m<sup>3</sup> 24- Hour Average.**

Year	1 <sup>st</sup> Quarter Average	2 <sup>nd</sup> Quarter Average	3 <sup>rd</sup> Quarter Average	4 <sup>th</sup> Quarter Average	Annual Average	24-Hour Max. Value	24-Hour 2 <sup>nd</sup> Max. Value
<b>2009</b>	<b>32</b>	<b>30</b>	<b>28</b>	<b>37</b>	<b>31.3</b>	<b>237</b>	<b>124</b>

## **PM<sub>10</sub> MONITORING NETWORK**

### **2009 Ambient Air Monitoring Network Plan**

**GERONIMO: AIRS # 040191113**



**Comments:** PM<sub>10</sub> Sampling began July 1, 2007.

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

The PDEQ PM<sub>2.5</sub> network consists of six monitoring sites in eastern Pima County, Arizona. **40 CFR 58.20, app. D. 4.7** PM<sub>2.5</sub> design criteria, provided guidance on the required number of SLAMS monitors. Two SLAMS Federal Reference Method (FRM) monitors were initiated in January, 1999 at the Orange Grove and Children's Park sites. In addition to two SLAMS monitors, Pima County has four Special Purpose hourly monitors. **The population is 843,746 for the Tucson, Arizona Metropolitan Statistical Area (MSA). The estimated population for 2008 was 1,012,018.**

#### 2009 PM<sub>2.5</sub> Design Criteria

Table 7

MSA Population Category	Design Value <85% <sup>1</sup>	# of Required PM <sub>2.5</sub> Monitors	# of PM <sub>2.5</sub> Monitors
500,000 – 1,000,000	yes	Requires 1 SLAMS Monitor	2 SLAMS Monitors
500,000 – 1,000,000	No requirement for SP	No requirement for SP	4 SP Monitors

<sup>1</sup> Most recent 3 – year design value <85% of any PM<sub>2.5</sub> NAAQS

General Statement regarding changes to the PM<sub>2.5</sub> network:

PDEQ does not have any violating monitors or proposals to move or change any monitors at this time. In the event of changes to the PM<sub>2.5</sub> network or violating monitors, PDEQ would detail all information and present it to the public for comment and would forward all comments and information to EPA for approval. After approval, PDEQ would then initiate any changes.

The SLAMS FRM monitors are filter-based low-volume samplers that collect a sample for 24 hours on a 1 in 3 day cycle. A co-located sampler at the Children's Park site runs on a 1 in 12 day cycle for precision assessment.

Continuous PM<sub>2.5</sub> monitoring was initiated in May, 2000 at the Green Valley site using Beta Mass Attenuation and a sharp-cut cyclone downstream of the PM<sub>10</sub> inlet to achieve the 2.5 cut-point, allowing only the fine particulates to pass on to the sample collection substrate. This installation was a pilot project and was followed by similar installations at the Rose Elementary and Coachline monitoring sites. All three sites were a part of the EMPACT project (Environmental Monitoring for Public Access and Community Tracking), designed to provide near real-time data to the public via the internet and PDEQ web pages. A fourth monitor was added at the Geronimo site to provide fine particulate data for AQI reporting. The Met One BAM 1020 monitors provide automatic concentration measurement on an hourly basis, and output the reading to the site data logger, which is then polled every hour, and the data posted on the PDEQ website. The data obtained by both FRM and continuous PM<sub>2.5</sub> monitors in Tucson are submitted quarterly to the EPA's Air Quality System (AQS) database.

Pima County Department of Environmental Quality operates a filter weigh lab for the processing of Pima County's PM<sub>10</sub> and PM<sub>2.5</sub> network filters, excluding PM<sub>2.5</sub> speciation filters. This weigh lab follows all requirements set forth in **40 CFR 50, App. L.**

The PM<sub>2.5</sub> Chemical Speciation Trends Network was established by EPA in 1999 to determine the chemical speciation of fine particulates. PM<sub>2.5</sub> speciation monitoring began in Pima County at the Children’s Park location in February, 2002. The samples are analyzed for total mass, forty eight elements, cations, nitrate, sulfate, organic and elemental carbon. Analysis and reporting is completed by RTI International. Summary PM<sub>2.5</sub> data for 2009 is included in this report.

### Violation History

The PM<sub>2.5</sub> standards (effective December 17, 2006): the annual PM<sub>2.5</sub> standard is met when the three year average of the spatially averaged annual mean is less than or equal to 15ug/m<sup>3</sup> and the 24 hour standard is met when the three year average of the 98<sup>th</sup> percentile value at each site is less than or equal to 35ug/m<sup>3</sup>. No exceedances of the annual or 24 - hour NAAQS were recorded in Tucson in 2009.

### Quality Assurance for Particulate Matter PM<sub>2.5</sub>

All data quality assessment requirements as outlined in **40 CFR 58, app. A** have been met in 2009, and include both internal and EPA PEP audits, and the co-located sampler at the Children’s Park site.

The accuracy of PM<sub>2.5</sub> sampling is assessed by auditing the flow rate each calendar quarter. The difference in the flow rate between the audit flow measurement and the flow indicated by the sampler is used to calculate accuracy. A combined accuracy probability interval is calculated for PM<sub>2.5</sub> along with separate probability limits for each audit concentration level for automated analyzers. Pima County reports the results of all valid precision and accuracy tests on a quarterly basis to the Air Quality System (AQS) database.

**Table 8**

Protocol	Instrument	Frequency	Date Completed 2009
Flow rate verification	Met One BAM 1020	Weekly	
Flow Rate Audit	Met One BAM 1020	Quarterly	Green Valley 02/03, 06/23, 09/02, 12/14 Geronimo 02/04, 06/22, 09/01, 12/10 Rose Elementary 02/03, 06/26, 09/02,12/14 Coachline 02/09, 06/22, 09/01, 12/22
Flow rate verification	R& P Partisol-Plus 2025 Sequential R & P 2000	Monthly	
Flow Rate Audit	R& P Partisol-Plus 2025 Sequential R& P 2000 (Co- located) Met One SASS (Speciation)	Quarterly	Orange Grove 02/09, 05/04, 09/02, 12/11 Children’s Park 02/09, 05/04, 09/23, 09/17, 12/11 Children’s Park (Co-located) 02/09,05/04,09/23,12/11 Children’s Park (Speciation) 03/11,05/04, 09/23,12/22

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>ORANGE GROVE</b>	
<b>AQS code:</b>	040190011	
<b>Address:</b>	4301 West Orange Grove Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.322550 / -111.037700	
<b>Elevation:</b>	2234	
<b>Method:</b>	118	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	R&P Partisol-Plus 2025	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	120	
<b>Annual arithmetic mean:</b>	5.27 µg/m <sup>3</sup>	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Every three days sampling	
<b>Probe height:</b>	2.65 meters above the ground in a city water well site	
<b>Surrounding landscape:</b>	Gravel in fenced compound, dirt road shoulders, weeds	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	This site is situated in a residential area with light commerce and industry. There is an asphalt batch plant with a large gravel pit less than three kilometers to the west of the site in the Santa Cruz River bed area.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	37 meters west of Camino de la Tierra and 70 meters south of Orange Grove Road with a 2007 ADT of 22,000
	<b>2</b>	2 kilometers east of Interstate 10 with a 2006 ADT of 105,000
<b>Suitable for comparison to NAAQS:</b>	Yes	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### ORANGE GROVE: AIRS # 040190011



**Comments:** PM<sub>2.5</sub> sampling began at this neighborhood scale site in January, 1999. It is located near the confluence of the Santa Cruz, Rillito and Canada del Oro Rivers in the Tucson Valley, toward the northwest end of the air planning area. The site is situated near a freeway and railroad tracks.

**Annual summary statistics:** NAAQS: 15 µg/m<sup>3</sup> Annual Average, 35 µg/m<sup>3</sup> 24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	98 <sup>th</sup> % Value	Annual Average
2009	13.9	11.6	10.8	10.5	10.8	5.27

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>CHILDREN'S PARK</b>	
<b>AQS code:</b>	040191028	
<b>Address:</b>	400 W. River Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.295150 / -110.982300	
<b>Elevation:</b>	2286	
<b>Method:</b>	118	
<b>Number of monitors:</b>	2	
<b>Type of monitor:</b>	R& P Partisol-Plus 2025	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of daily observations:</b>	121	
<b>Annual arithmetic mean:</b>	5.46 µg/m <sup>3</sup>	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Every three days; every twelve days for co-located sampler	
<b>Probe height:</b>	3.1 meters above the ground on a platform located in a city water well site.	
<b>Distance between collocated monitors:</b>	1.2m	
<b>Surrounding landscape:</b>	Gravel in walled compound, dirt parking lot, dry river bed	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	This site is located at the confluence of the Rillito River and Pima Wash, a natural low spot in the local topography. Single - family residences and a popular county park with exercise trails extend to the north, northwest, and west, respectively. Heavy commercial usage dominates to the south and east, including large shopping malls and automobile dealerships.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2006 ADT of 52,000.
	<b>2</b>	River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400.
<b>Suitable for comparison to NAAQS:</b>	Yes	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### CHILDREN'S PARK: AIRS # 040191028



**Comments:** PM<sub>2.5</sub> sampling began at this neighborhood scale site in January, 1999.

**Annual summary statistics:** NAAQS: 15 µg/m<sup>3</sup> Annual Average, 35 µg/m<sup>3</sup> 24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	98 <sup>th</sup> % Value	Annual Average
<b>2009</b>	<b>15.8</b>	<b>12.3</b>	<b>12.0</b>	<b>10.2</b>	<b>12.0</b>	<b>5.46</b>

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>ROSE ELEMENTARY</b>	
<b>AQS code:</b>	040191032	
<b>Address:</b>	710 W. Michigan, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.172950 / -110.980050	
<b>Elevation:</b>	2387	
<b>Method:</b>	731	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Met-One Beta Attenuation 1020	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8613	
<b>Annual arithmetic mean:</b>	5.44 µg/m <sup>3</sup>	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.9 meters above the ground on the roof of a shelter located on the grounds of Rose Elementary School	
<b>Surrounding landscape:</b>	Grass playground	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	The site is located in a residential neighborhood with light commercial enterprises. The Santa Cruz River, with several sand and gravel operations, parallels the interstate one kilometer to the west.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	12 <sup>th</sup> Avenue to the east with a 2006 ADT of 21,000
	<b>2</b>	Ajo Way to the north with a 2006 ADT of 31,100
		Interstate 19 runs north-south half a kilometer to the west with a 2006 ADT 83,800
<b>Suitable for comparison to NAAQS:</b>	No	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### ROSE ELEMENTARY: AIRS # 040191032



**Comments:** This monitor was initially installed in October of 2000 as part of the Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. This area was identified as having higher than normal number of pediatric asthma cases. Pima County began reporting the PM<sub>2.5</sub> data to EPA July, 2003.

**Annual summary statistics:** NAAQS: 15 µg/m<sup>3</sup> Annual Average, 35 µg/m<sup>3</sup> 24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	98 <sup>th</sup> % Value	Annual Average
<b>2009</b>	<b>22.3</b>	<b>16.2</b>	<b>16.0</b>	<b>15.8</b>	<b>12.0</b>	<b>5.44</b>

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>COACHLINE</b>	
<b>AQS code:</b>	040191034	
<b>Address:</b>	9597 N. Coachline, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.380820 / -111.127160	
<b>Elevation:</b>	2228	
<b>Method:</b>	731	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Met-One Beta Attenuation 1020	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8406	
<b>Annual arithmetic mean:</b>	5.54 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.9 meters above the ground on a shelter on Tucson's far northwest side	
<b>Surrounding landscape:</b>	Dirt within walled compound, residential neighborhood	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	The site is situated in a residential neighborhood. The normally dry Santa Cruz River runs northwest between the Interstate and the neighborhood and contributes to airborne dust through previous deposition of fine clay soils throughout the floodplain. This area has previously been used for farming and ranching, and sand and gravel operations are still in operation five to ten kilometers upstream to the southwest. Considerable new construction of roads, homes and businesses throughout this burgeoning area exacerbate entrainment of the fine soils.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	approximately 1.25 kilometers west of Interstate 10 with a 2006 ADT of 49,000
	<b>2</b>	.5 kilometer north of Silverbell Road 2006 ADT of 27,900
<b>Suitable for comparison to NAAQS:</b>	No	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**COACHLINE: AIRS # 040191034**



**Annual summary statistics:** NAAQS: 15 µg/m<sup>3</sup> Annual Average, 35 µg/m<sup>3</sup> 24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	98 <sup>th</sup> % Value	Annual Average
<b>2009</b>	<b>29.0</b>	<b>14.5</b>	<b>13.8</b>	<b>13.2</b>	<b>12.0</b>	<b>5.54</b>

**Comments:** This monitor was initially installed in March of 2001 as part of the Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. This area was identified as having higher than normal number of pediatric asthma cases. Pima County began reporting the PM<sub>2.5</sub> data to EPA July, 2003.

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>GREEN VALLEY</b>	
<b>AQS code:</b>	040191030	
<b>Address:</b>	601 N. La Canada Drive, Green Valley, AZ	
<b>Latitude/ Longitude:</b>	31.87952 / -110.996440	
<b>Elevation:</b>	2638	
<b>Method:</b>	731	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Met-One Beta Attenuation 1020	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8609	
<b>Annual arithmetic mean:</b>	4.04 µg/m <sup>3</sup>	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.8 meters above the ground on a shelter	
<b>Surrounding landscape:</b>	Dirt, sparse desert vegetation	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a residential / commercial area. Open pit copper mines and tailings ponds are located four kilometers to the west of the community.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	100 meters west of La Canada (2006 ADT of 15,200)
	<b>2</b>	0.5 kilometers west of Interstate 19 (2006 ADT of 30,000)
<b>Suitable for comparison to NAAQS:</b>	No	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics:** NAAQS: 15 µg/m<sup>3</sup> Annual Average, 35 µg/m<sup>3</sup> 24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	98 <sup>th</sup> % Value	Annual Average
<b>2009</b>	<b>12.3</b>	<b>11.9</b>	<b>10.0</b>	<b>9.4</b>	<b>9.0</b>	<b>4.04</b>

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### GREEN VALLEY: AIRS # 040191030



**Comments:** This site is fifty kilometers south of Downtown Tucson in the retirement community of Green Valley. This monitor was initially installed in May of 2000 as part of the Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. Pima County began reporting the PM<sub>2.5</sub> data to EPA July, 2003.

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>GERONIMO</b>	
<b>AQS code:</b>	040191113	
<b>Address:</b>	2498 N. Geronimo, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.251840 / -110.965300	
<b>Elevation:</b>	2452	
<b>Method:</b>	731	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Met-One Beta Attenuation 1020	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8265	
<b>Annual arithmetic mean:</b>	8.22 $\mu\text{g}/\text{m}^3$	
<b>Number /dates of 24-hour standard exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.6 meters	
<b>Surrounding landscape:</b>	Dirt, dead shrubs, unpaved road shoulder	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a residential area in a City of Tucson water well site.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	one block south of Grant Road (2006 ADT 43,000)
	<b>2</b>	and three blocks east of Stone Avenue (2007 ADT 24,700)
<b>Suitable for comparison to NAAQS:</b>	No	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics:** NAAQS: 15  $\mu\text{g}/\text{m}^3$  Annual Average, 35  $\mu\text{g}/\text{m}^3$  24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	98 <sup>th</sup> % Value	Annual Average
<b>2009</b>	<b>30.8</b>	<b>18.8</b>	<b>18.5</b>	<b>18.5</b>	<b>18.0</b>	<b>8.22</b>

## PM<sub>2.5</sub> MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**GERONIMO: AIRS # 040191113**



**Comments:** This monitor was initially installed in July of 2001 for Air Quality Index reporting using a continuous monitor. Pima County began reporting the PM<sub>2.5</sub> data to EPA July, 2003.

## PM<sub>2.5</sub> SPECIATION

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>CHILDREN'S PARK (Speciation)</b>	
<b>AQS code:</b>	040191028 POC 5	
<b>Address:</b>	400 W. River Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.295150 / -110.982300	
<b>Elevation:</b>	2286	
<b>Method:</b>	810	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Met One SASS	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose PM <sub>2.5</sub> Speciation	
<b>Analyzing &amp; Reporting Org</b>	<b>RTP</b>	
<b>Collecting Org</b>	<b>Pima County Department of Environmental Quality</b>	
<b>Number of daily observations:</b>	50	
<b>Annual arithmetic mean:</b>	6.33 µg/m <sup>3</sup>	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Every 6 <sup>th</sup> day	
<b>Probe height:</b>	3 meters above the ground on a platform located in a city water well site.	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Surrounding landscape:</b>	Gravel in walled compound, dirt parking lot, dry river bed	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2005 ADT of 49,900.
	<b>2</b>	River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400.
<b>Suitable for comparison to NAAQS:</b>	No	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Annual summary statistics:** NAAQS: 15 µg/m<sup>3</sup> Annual Average, 35 µg/m<sup>3</sup> 24 Hour Average.

Year	Highest 24 Hr Value	2 <sup>nd</sup> Highest Value	3 <sup>rd</sup> Highest Value	4 <sup>th</sup> Highest Value	Annual Average
<b>2009</b>	<b>19.9</b>	<b>12.4</b>	<b>11.0</b>	<b>10.7</b>	<b>6.33</b>

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

Motor vehicles are the primary source of carbon monoxide (CO) in the Tucson area. Data and reports from the Arizona Department of Transportation (MVD) show that there were 925,549 vehicles registered in Pima County in 2009 compared with 585,636 in 2000. In spite of increased vehicular traffic, CO levels have dropped considerably since the county began monitoring in 1973. The dramatic decrease can primarily be contributed to the progress made by automobile manufacturers in meeting federally mandated tailpipe emissions standards and to the state vehicle inspection / maintenance programs.

Carbon Monoxide is monitored at six locations throughout the Pima County air quality control district. The revised requirements for Carbon Monoxide **40 CFR 58, app. D, 4.2** state that there is no minimum number of CO monitoring sites required. Pima County is operating under the auspices of the CO Limited Maintenance Plan (LMP) and has maintained the same number of sites in order to meet and exceed the requirements of the LMP.

**2009 CO Design Criteria  
Table 9**

<b>MSA Population Category</b>	<b># of Required CO Monitors</b>	<b># of CO Monitors</b>
500,000 – 1,000,000	No Specific Requirement	2 SLAMS Monitors
		4 SP Monitors

#### Violation History

No exceedances of the National Ambient Air Quality Standards for CO were recorded in Tucson in 1989 through 2009. In January 1988, the eight - hour health standard of nine parts per million was exceeded once at two monitoring sites on the same day. The last exceedance of the eight - hour standard prior to 1988 occurred in December 1986 at a special purpose microscale location (Broadway / Craycroft). Pima County's status for CO was reclassified to attainment with the implementation of a Limited Maintenance Plan on April 25, 2000 by the EPA. The Carbon Monoxide Limited Maintenance Plan was developed in conjunction with Pima Association of Governments and approved by EPA to help mitigate any future violations. The plan allows for additional mobile monitoring of CO at high volume intersections, and a microscale site located at Golf Links & Kolb established, September, 2002.

#### Quality Assurance for Carbon Monoxide

All data quality assessment requirements as outlined in **40 CFR 58, app. A**, have been met in 2009. The precision of SLAMS automated analyzers is based on one-point precision checks conducted every two weeks, when each analyzer is challenged by a known concentration of a check gas. For CO the concentrations are between 8.0 and 10.0 ppm. The requirements include annual audits performed in-house for accuracy. The CO audit point level 1 is 3-8 ppm, level 2 is 15- 20 ppm and level 3 is 35-45 ppm. All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 10**

<b>Carbon Monoxide Audit Dates 2009</b>	
Craycroft & 22 <sup>nd</sup> St.	6/17, 12/30
Children's Park	03/11, 09/17
Downtown	01/26, 08/13
Cherry & Glenn ; Seasonal	03/31
Alvernon & 22 <sup>nd</sup> St.	03/12, 09/29
Golf Links & Kolb ; Seasonal	03/31

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>DOWNTOWN MONITOR CLOSED 8/13/2009</b>	
<b>AQS code:</b>	040190002	
<b>Address:</b>	190 W. Pennington Street, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.222050 / -110.974850	
<b>Elevation:</b>	2365	
<b>Method:</b>	054	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental non-dispersive infrared	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	5366	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	Years: 1976, 1977, 1983 and 1988	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	8.1 meters above the ground on the roof of the PDEQ laboratory building	
<b>Probe material / Residence time:</b>	FEP Teflon/ 12.63 seconds	
<b>Surrounding landscape:</b>	Roof, paved streets and parking areas	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in the downtown commercial district. Sources are from vehicular emissions along the street corridors.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	49.5 Meters north of Congress Street (2006 ADT of 36,800)
	<b>2</b>	14.2 Meters south of Pennington Street (2004 ADT of 2,000)
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This Downtown monitor was closed 8-13-2009 due to budget restraints and generally low levels of carbon monoxide. This site had been monitored continuously since 1973. In July, 2004 the probe was relocated to eliminate persistent biased readings from maintenance vehicles and construction equipment parking directly under it with engines running. It was relocated to the roof of the Air Monitoring lab, adjacent to the ozone probe.

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**DOWNTOWN:** AIRS # 040190002



**Annual summary statistics:** NAAQS: 35ppm 1-Hour Average, 9ppm 8- Hour Average.

One – hour average concentrations	ppm	Date	Hour
Highest	1.8	01/19	0800
Second Highest	1.5	01/16	2200

Eight – hour average concentrations	ppm	Date	Hour
Highest	1.0	01/17	0100
Second Highest	1.0	01/19	1000

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>	
<b>AQS code:</b>	040191011	
<b>Address:</b>	1237 S. Beverly Avenue, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.204420 / -110.878150	
<b>Elevation:</b>	2582	
<b>Method:</b>	054	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental non-dispersive infrared	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8715	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.1 meters above the ground on the roof of a shelter located in a city water well site.	
<b>Probe material / Residence time:</b>	FEP Teflon / 2.5 seconds	
<b>Surrounding landscape:</b>	Dirt, ephemeral weeds	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a predominately residential eastside area with commercial activity lining nearby arterial routes. There is a large covered water reservoir north of the location.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	260 meters west is Craycroft Road with 2006 ADT of 33,800
	<b>2</b>	260 meters north is 22 <sup>nd</sup> Street with a 2004 ADT of 52,400
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site is one of the oldest in the monitoring network, originally established in 1973, and has operated continuously to the present.

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**22<sup>ND</sup> STREET & CRAYCROFT: AIRS # 040191011**



**Annual summary statistics: NAAQS: 35ppm 1-Hour Average, 9ppm 8- Hour Average**

One – hour average concentrations	ppm	Date	Hour
Highest	1.9	01/08	2000
Second Highest	1.8	01/12	0700

Eight – hour average concentrations	ppm	Date	Hour
Highest	1.0	01/08	2200
Second Highest	0.8	01/05	2200

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>22<sup>ND</sup> STREET &amp; ALVERNON</b>	
<b>AQS code:</b>	040191014	
<b>Address:</b>	3895 E. 22 <sup>nd</sup> Street, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.207390 / -110.910650	
<b>Elevation:</b>	2516	
<b>Method:</b>	054	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental non-dispersive infrared	
<b>Monitoring site type:</b>	Highest Concentration	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Microscale	
<b>Number of hourly observations:</b>	8717	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	Years: 1975 - 1986 and 1988	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	3.4 meters above the ground attached to a wall near 22 <sup>nd</sup> Street at a Tucson Water well site	
<b>Probe material / Residence time:</b>	FEP Teflon / 19.4 seconds	
<b>Surrounding landscape:</b>	Gravel in walled compound, paved streets and sidewalks	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	This site is situated in a commercial area. A large regional park is located to the northwest of the site.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	60 meters west of Alvernon Way with a 2004 ADT of 36,900
	<b>2</b>	10 meters north of 22 <sup>nd</sup> Street with a 2006 ADT of 44,800
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** The site was relocated in October, 2001 to a Tucson Water well site 50 meters west of the original location. The move was necessitated by an intersection improvement project and anticipated construction on the northwest corner. The shelter was moved again in January, 2004, to a different corner within the well site, and the probe was attached to a wall in virtually the same location as before the shelter was moved, so airflow from the intersection would remain unrestricted. 22<sup>nd</sup> & Alvernon continues to measure the highest CO concentrations in the network. The prevailing morning- hour southeasterly winds usually disperse CO generated in the intersection. During stagnant conditions, especially during the winter inversion formation, CO generated in the intersection has a longer residence time. Although population exposure is limited at this location, 22<sup>nd</sup> & Alvernon is representative of worst-case intersections in Tucson. This site has been operating continuously since 1975. No exceedances of the eight-hour health standard were recorded in 1989 through 2009.

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**22<sup>ND</sup> STREET & ALVERNON: AIRS # 040191014**



**Annual summary statistics:** NAAQS: 35ppm 1-Hour Average, 9ppm 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	2.3	01/13	0800
Second Highest	2.2	01/12	0700

Eight – hour average concentrations	ppm	Date	Hour
Highest	1.2	01/08	2200
Second Highest	1.1	01/08	1200

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

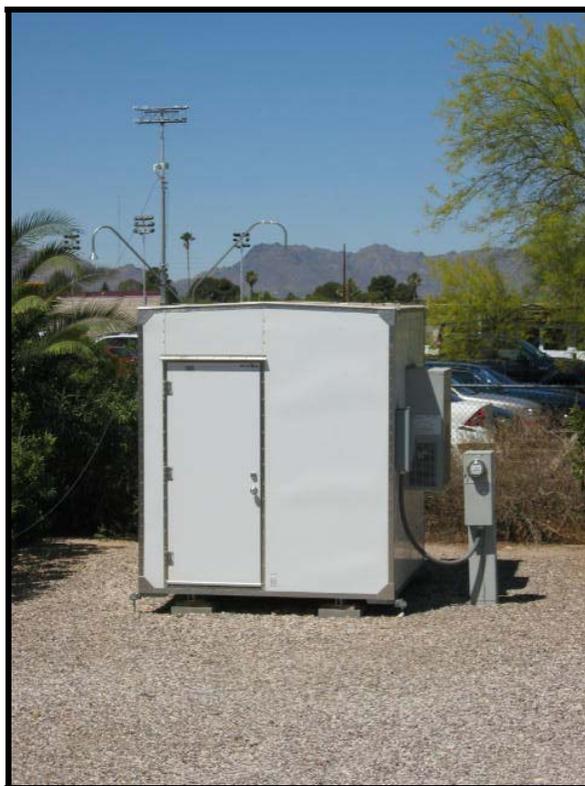
<b>Site Name:</b>	<b>CHERRY &amp; GLENN</b>	
<b>AQS code:</b>	040191021	
<b>Address:</b>	2745 N. Cherry Avenue, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.25658 / -110.948650	
<b>Elevation:</b>	2400	
<b>Method:</b>	054	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental non-dispersive infrared	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	3158; Seasonal monitor operation from Jan 1- March 31 and Oct.1 – Dec. 31	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.9 meters above the ground on a shelter in a city water well site.	
<b>Probe material / Residence time:</b>	FEP Teflon / 2.7 seconds	
<b>Surrounding landscape:</b>	Gravel in fenced compound, paved parking lot, streets	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>		
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	0.8 kilometers north of Grant Road with a 2006 ADT of 41,400
	<b>2</b>	0.5 kilometers west of Campbell Avenue with a 2006 ADT of 39,800.
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** Cherry & Glenn was established as a special purpose site in February 1989, in order to assess the CO levels at a distance (less than 1 kilometer) from a typical high-volume intersection. This site has historically recorded very low levels of CO during the summer months. Consequently, in 2001, seasonal monitoring began with sampling from October through April.

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### CHERRY & GLENN: AIRS # 040191021



**Annual summary statistics:** NAAQS: 35ppm 1-Hour Average, 9ppm 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	2.2	10/30	2200
Second Highest	1.9	01/08	2200

Eight – hour average concentrations	ppm	Date	Hour
Highest	1.3	01/01	0500
Second Highest	1.2	01/09	2400

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>CHILDREN'S PARK</b>	
<b>AQS code:</b>	040191028	
<b>Address:</b>	400 W. River Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.295150 / -110.982300	
<b>Elevation:</b>	2286	
<b>Method:</b>	054 / 093	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental non-dispersive infrared	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8338	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.25 meters above the ground on a shelter in a city water well site	
<b>Probe material / Residence time:</b>	FEP Teflon/ 3.1 seconds	
<b>Surrounding landscape:</b>	Gravel in walled compound, dirt parking lot, dry river bed	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	This site is located at the confluence of the Rillito River and Pima Wash, a natural low spot in the local topography. Single - family residences and a popular county park with exercise trails extend to the north, northwest, and west, respectively. Heavy commercial usage dominates to the south and east, including large shopping malls and automobile dealerships.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	State Route 77 runs north – south 0.5 kilometers to the east with a 2006 ADT of 52,000
	<b>2</b>	River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site began monitoring for Carbon Monoxide in October, 1998.

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### CHILDREN'S PARK: AIRS # 040191028



**Annual summary statistics:** NAAQS: 35ppm 1-Hour Average, 9ppm 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	1.6	12/28	1000
Second Highest	1.2	01/12	0900

Eight – hour average concentrations	ppm	Date	Hour
Highest	1.0	12/28	1100
Second Highest	0.9	12/26	0200

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>GOLF LINKS &amp; KOLB</b>	
<b>AQS code:</b>	040191031	
<b>Address:</b>	2601 South Kolb Road	
<b>Latitude/ Longitude:</b>	32.191180 / -110.840550	
<b>Elevation:</b>	2661	
<b>Method:</b>	054 / 093	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental non-dispersive infrared	
<b>Monitoring site type:</b>	Highest Concentration	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Microscale	
<b>Number of hourly observations:</b>	4351 ; Seasonal Monitor operating Jan. 1- April 30 and Oct. 1 – Dec. 31	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>	0	
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	3.0 meters above the ground on a pole located next to Kolb road	
<b>Probe material / Residence time:</b>	FEP Teflon / 34.9 seconds	
<b>Surrounding landscape:</b>	Dirt lot and easement, paved street	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is located near the southeast corner of Golf Links and Kolb roads in a City of Tucson water reservoir site. Light commercial enterprises occupy all four corners and separate the intersection from residential neighborhoods.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	100 meters south of Golf Links, with a 2006 ADT of 38,500
	<b>2</b>	2 meters east of Kolb Road, with a 2007 ADT of 42,000.
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** Golf Links & Kolb was established as a special purpose site in September 2002, as part of the Carbon Monoxide Limited Maintenance Plan. Inlet placement qualifies it as a microscale site, and sighting it on the southeastern quarter of the intersection provides an opposite wind direction compliment to the 22/Alvernon site. This site is operated seasonally, from October through March.

## CARBON MONOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### GOLF LINKS & KOLB: AIRS # 040191031



**Annual summary statistics:** NAAQS: 35ppm 1-Hour Average, 9ppm 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	1.7	01/06	1700
Second Highest	1.7	11/05	1800

Eight – hour average concentrations	ppm	Date	Hour
Highest	1.1	01/05	2100
Second Highest	1.0	01/06	2000

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

Ozone (O<sub>3</sub>) is currently being monitored at eight locations in Tucson and one location in Green Valley. EPA has revised the minimum monitoring requirements for ozone. The design criteria for ozone monitoring is described in **40 CFR 58, app. D, Table D-2**.

#### 2009 O<sub>3</sub> Design Criteria

Table 11

MSA (8520)	Design Value <sup>1</sup>	# of O <sub>3</sub> Monitors
500,000 – 1,000,000	Requires 2 SLAMS Monitors	2 SLAMS Monitors
500,000 – 1,000,000	No Requirement for SP	7 SP Monitors

<sup>1</sup> Most recent 3- year design value concentration of  $\geq$  85% of any O<sub>3</sub> NAAQS.

#### Violation History

On March 12, 2008, EPA strengthened the ground level ozone standard, effective May 27, 2008. The primary standard of 0.08 ppm has been lowered to 0.075 ppm, keeping the form of the standard as the three year average of the fourth –highest daily maximum eight hour average ozone concentration. The secondary standard is identical to the primary standard. Pima County's final designation of compliance of this standard is still in review. Pima County will be in compliance of the standard if years 2006, 2007 and 2008 are used with our highest average being 0.074 ppm at the Saguaro Park location. While higher maximum one - hour and second high one - hour ozone values tend to be measured near the urban core, the more suburban and rural sites measure higher overall average ozone concentrations. In general the east side (Saguaro National Park East) is the area with the highest average ozone levels. The situation may be caused by the topography of the valley and the way air flows within it. The precursor pollutants are emitted, and in conjunction with sunlight and heat, will form ozone, which is typically transported by air currents to outlying areas.

#### Quality Assurance for Ozone

All data quality assessment requirements outlined in **40 CFR 58, app. A**, have been met in 2009. The requirements include precision checks every other week with a check gas range between 0.01 and 0.10 ppm with Pima County performing the precision check at 0.075 ppm, representing the highest level we are likely to achieve. The annual internal audits for accuracy are performed with four point check levels at zero, 0.035ppm, 0.080ppm, and 0.140ppm. Pima County maintains an ozone primary standard which is verified for accuracy by the California Air Resources Board in Sacramento. All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 12**

<b>Ozone Audit Dates 2009</b>	
Craycroft & 22 <sup>nd</sup> St.	06/17, 12/30
Children's Park	03/11, 09/17
Downtown	01/26, 08/13
Fairgrounds	06/12, 11/10
Tangerine	06/12, 11/10
Saguaro Park	06/12, 11/10
Coachline	02/09, 09/01
Rose Elementary	06/23, 12/14
Green Valley	06/23, 12/14

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>DOWNTOWN</b> <b>MONITOR CLOSED 08/13/2009</b>	
<b>AQS code:</b>	040190002	
<b>Address:</b>	190 W. Pennington Street, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.222020 / -110.974850	
<b>Elevation:</b>	2365	
<b>Method:</b>	047/ 087	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	5365	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	8.1 meters above the ground on the roof of the PDEQ laboratory building	
<b>Probe material / Residence time:</b>	FEP Teflon / 12.63 seconds	
<b>Surrounding landscape:</b>	Roof, paved streets and parking areas	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in the downtown commercial district. Vehicular emissions along the street corridors produce ozone precursors.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	49.5 Meters north of Congress Street with a 2006 ADT of 36,800
	<b>2</b>	14.2 meters south of Pennington Street with a 2004 ADT of 2,000
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** The Downtown site was relocated in October, 1991 from the fifth floor of the Health and Welfare building to a building approximately 50 meters to the west. This relocation placed the inlet probe closer to street level with unrestricted airflow, a significant improvement over the previous location. Data from this site, uninterrupted since 1973, has been useful in tracking high population exposure to ozone levels in the downtown area. Ozone levels recorded here have been consistently lower than in the outlying areas of the valley. This Downtown monitor was closed 8-13-2009 due to budget restraints and generally low levels of ozone.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**DOWNTOWN:** AIRS # 040190002



**Annual summary statistics:** NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	.082	08/05	1300
Second Highest	.079	07/11	1300

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.071	04/05	1100
Second Highest	.069	08/05	1100
Third Highest	.066	05/19	0900
Fourth Highest	.066	07/02	1100

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

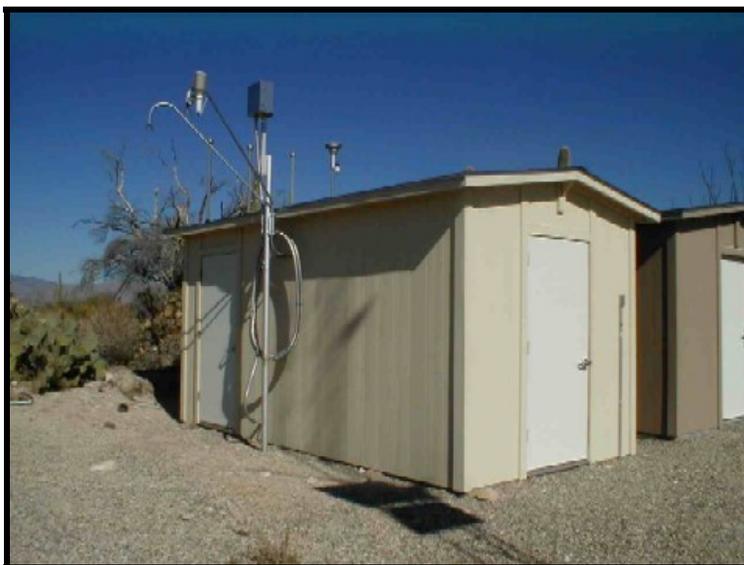
<b>Site Name:</b>	<b>SAGUARO PARK EAST</b>	
<b>AQS code:</b>	040190021	
<b>Address:</b>	3905 South Old Spanish Trail, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.174520 / -110.737160	
<b>Elevation:</b>	2286	
<b>Method:</b>	047	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Highest Concentration	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8741	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.1 meters above the ground in Saguaro National Park East on the roof of a shelter that is one kilometer south of the administration building.	
<b>Probe material / Residence time:</b>	FEP Teflon / 3.5 seconds	
<b>Surrounding landscape:</b>	Natural desert	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in the National Park. The nearby light residential area has no significant local sources of ozone precursors.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	80 meters east to Old Spanish Trail with a 2006 ADT of 6,200
	<b>2</b>	105 meters south of Escalante with a 2006 ADT of 4,000
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** The Saguaro National Park site has been active since 1982. The operation of the site was taken over by the National Park Service in 1987. The Park Service returned operation of the site to Pima County in 1993. Geographically, Saguaro National Park is on the eastern edge of the Tucson metropolitan area. Ozone data from this site has been used to study how the levels of ozone affect natural vegetation.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### SAGUARO PARK EAST: AIRS # 040190021



**Annual summary statistics:** NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	.075	05/06	1500
Second Highest	.074	04/30	1500

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.069	04/05	1100
Second Highest	.067	04/26	0900
Third Highest	.067	04/30	1100
Fourth Highest	.067	08/05	1000

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>	
<b>AQS code:</b>	040191011	
<b>Address:</b>	1237 S. Beverly Avenue, Tucson, AZ.	
<b>Latitude/ Longitude:</b>	32.204420 / -110878150	
<b>Elevation:</b>	2582	
<b>Method:</b>	087	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8731	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.1 meters above the ground on the roof of a shelter located in a city water well site.	
<b>Probe material / Residence time:</b>	FEP Teflon / 4.3 seconds	
<b>Surrounding landscape:</b>	Dirt, ephemeral weeds	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a predominately residential eastside area with commercial activity lining nearby arterial routes. There is a large covered water reservoir north of the location.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	260 meters west is Craycroft Road with 2006 ADT of 33,800
	<b>2</b>	260 meters north is 22 <sup>nd</sup> Street with a 2004 ADT of 52,400
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site is one of the oldest in the monitoring network, originally established in 1973, and operated continuously to the present.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**22<sup>ND</sup> STREET & CRAYCROFT: AIRS # 040191011**



**Annual summary statistics: NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average**

One – hour average concentrations	ppm	Date	Hour
Highest	.079	08/05	1600
Second Highest	.077	07/02	1600

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.068	08/05	1000
Second Highest	.064	04/05	1000
Third Highest	.063	05/19	0900
Fourth Highest	.063	07/02	1100

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>TANGERINE</b>
<b>AQS code:</b>	040191018
<b>Address:</b>	12101 N. Camino de Oeste, Tucson, AZ
<b>Latitude/ Longitude:</b>	32.425250 / -111.063500
<b>Elevation:</b>	2638
<b>Method:</b>	047
<b>Number of monitors:</b>	1
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption
<b>Monitoring site type:</b>	Highest Concentration
<b>Classification:</b>	Special Purpose
<b>Scale:</b>	Urban
<b>Number of hourly observations:</b>	8629
<b>Number /dates of exceedances in 2009:</b>	0
<b>Historical exceedances:</b>	
<b>Sampling frequency:</b>	Continuous
<b>Probe height:</b>	3.75 meters above the ground on a shelter on Tucson's far northwest side.
<b>Probe material / Residence time:</b>	FEP Teflon / 4.2 seconds
<b>Surrounding landscape:</b>	Dirt, sparse desert vegetation
<b>Degrees of unrestricted air flow:</b>	360
<b>Location description:</b>	This site has been situated in a relatively undisturbed natural desert area for most of it's existence, but residential developments in recent years have been built to within 2 kilometers to the north west, and low density residential developments are encroaching from the south, east and north to within 3 kilometers to 5 kilometers.
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>   Tangerine Road runs approximately east - west 70 meters south of the site with a 2005 ADT of 8,000.
	<b>2</b>
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes

**Comments:** Tangerine was established in November 1989. Ozone concentrations at this site have been the highest in the network on occasion. This may be due to the prevailing southeasterly winds transporting ozone from the urban area. Concentrations remain high well into the night and early morning.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**TANGERINE: AIRS # 040191018**



**Annual summary statistics: NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average**

One – hour average concentrations	ppm	Date	Hour
Highest	.084	04/05	1700
Second Highest	.082	07/17	1500

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.077	04/05	1100
Second Highest	.069	04/30	1200
Third Highest	.069	07/02	1100
Fourth Highest	.068	07/17	1000

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

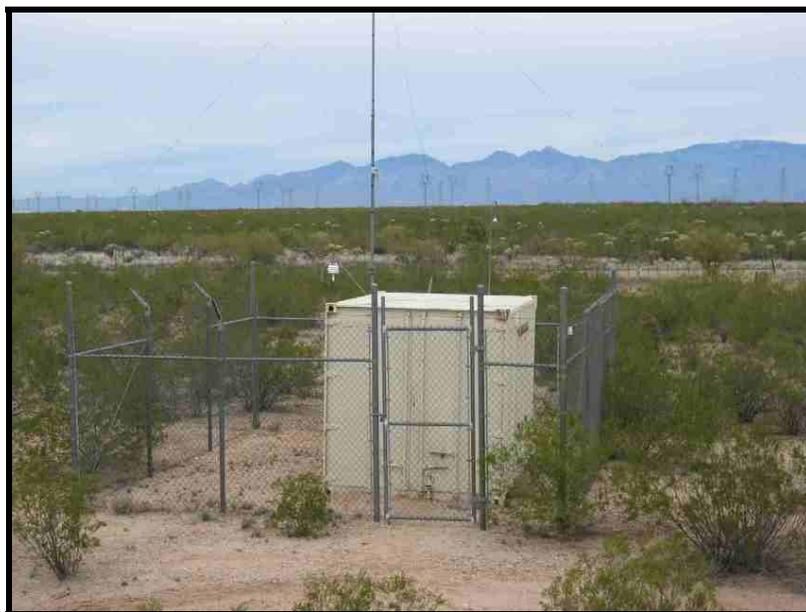
<b>Site Name:</b>	<b>FAIRGROUNDS</b>	
<b>AQS code:</b>	040191020	
<b>Address:</b>	11330 S. Houghton Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.047650 / -110.774350	
<b>Elevation:</b>	3078	
<b>Method:</b>	047	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Natural Background	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Urban	
<b>Number of hourly observations:</b>	8655	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	3.6 meters above the ground on a shelter on Tucson's far southeast side	
<b>Probe material / Residence time:</b>	FEP Teflon / 3.5 seconds	
<b>Surrounding landscape:</b>	Natural desert vegetation on lag gravel	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in an undisturbed natural desert area to the north and east. The Pima County Fairgrounds and drag strip are located directly southwest of the site.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	53 meters west of Houghton road with a 2006 ADT of 8,000
	<b>2</b>	
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** Fairgrounds was established in October 1989. Ozone concentrations at this site have been the highest in the network on occasion. This may be due to the afternoon wind shift that takes place almost daily in the Tucson basin. The wind may be transporting urban ozone precursors or stable ozone to the far east end of the Tucson air planning area.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**FAIRGROUNDS: AIRS # 040191020**



**Annual summary statistics: NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average**

One – hour average concentrations	ppm	Date	Hour
Highest	.079	03/23	1400
Second Highest	.074	07/15	1300

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.068	03/23	1000
Second Highest	.066	04/26	0900
Third Highest	.065	08/05	1000
Fourth Highest	.064	04/05	0900

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>CHILDREN'S PARK</b>	
<b>AQS code:</b>	040191028	
<b>Address:</b>	400 W. River Road, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.295150 / -110.982300	
<b>Elevation:</b>	2286	
<b>Method:</b>	047	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Urban	
<b>Number of hourly observations:</b>	8726	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.25 meters above the ground on a shelter located in a city water well site.	
<b>Probe material / Residence time:</b>	FEP Teflon / 5.3 seconds	
<b>Surrounding landscape:</b>	Gravel in walled compound, dirt parking lot, dry river bed	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	This site is located at the confluence of the Rillito River and Pima Wash, a natural low spot in the local topography. Single - family residences and a popular county park with exercise trails extend to the north, northwest, and west, respectively. Heavy commercial usage dominates to the south and east, including large shopping malls and automobile dealerships.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	State Route 77 runs north – south 0.5 kilometers to the east with a 2006 ADT of 52,000
	<b>2</b>	River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site began August of 1997 and is a relocation (1.5 kilometers, northeast) of the Pomona site. This site is representative of a neighborhood scale in the north central region of the air planning area where ozone levels are generally expected to be high due to the low altitude and the prevailing southeasterly winds.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### CHILDREN'S PARK: AIRS # 040191028



**Annual summary statistics:** NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	.080	07/02	1400
Second Highest	.079	04/05	1500

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.073	04/05	1100
Second Highest	.070	08/05	1000
Third Highest	.069	07/17	1000
Fourth Highest	.067	07/02	1100

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>ROSE ELEMENTARY</b>	
<b>AQS code:</b>	040191032	
<b>Address:</b>	710 W. Michigan, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.172950 / -110.980050	
<b>Elevation:</b>	2387	
<b>Method:</b>	087	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8669	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.1 meters above the ground on the roof of a shelter located on the grounds of Rose Elementary School.	
<b>Probe material / Residence time:</b>	FEP Teflon / 4.6 seconds	
<b>Surrounding landscape:</b>	Grass playground	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	The site is located in a residential neighborhood with light commercial enterprises bordering to the east, and the Santa Cruz River, with several sand and gravel operations, parallels the interstate another half kilometer to the west.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	12 <sup>th</sup> Avenue to the east with a 2006 ADT of 21,000
	<b>2</b>	Ajo Way to the north with a 2006 ADT of 31,100
	<b>3</b>	Interstate 19 runs north-south half a kilometer to the west with a 2006 ADT 80,000
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site was initially established in October of 2000 as part of the Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. This area was identified as having higher than normal number of pediatric asthma cases. Pima County began reporting the ozone data to EPA July, 2003.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**ROSE ELEMENTARY: AIRS # 040191032**



**Annual summary statistics:** NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average

One – hour average concentrations	ppm	Date	Hour
Highest	.076	08/05	1300
Second Highest	.071	04/05	1400

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.066	04/05	1000
Second Highest	.066	08/05	1000
Third Highest	.063	03/23	1100
Fourth Highest	.061	04/26	0900

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>COACHLINE</b>	
<b>AQS code:</b>	040191034	
<b>Address:</b>	9597 N. Coachline Blvd. Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.380820 / -111.127160	
<b>Elevation:</b>	2228	
<b>Method:</b>	087	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8712	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	3.1 meters above the ground on a shelter on Tucson's far northwest side	
<b>Probe material / Residence time:</b>	FEP Teflon / 4.6 seconds	
<b>Surrounding landscape:</b>	Dirt within walled compound, residential neighborhood	
<b>Degrees of unrestricted air flow:</b>	270	
<b>Location description:</b>	The site is situated in a residential neighborhood.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	approximately 1.25 kilometers west of Interstate 10 with a 2006 ADT of 49,000
	<b>2</b>	.5 kilometer north of Silverbell Road 2006 ADT of 27,900
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site was initially established in April of 2001 as part of the Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. This area was identified as having higher than normal number of pediatric asthma cases. Pima County began reporting the ozone data to EPA July, 2003.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**COACHLINE: AIRS # 040191034**



**Annual summary statistics: NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average**

One – hour average concentrations	ppm	Date	Hour
Highest	.082	04/05	1500
Second Highest	.072	07/01	1500

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.075	04/05	1100
Second Highest	.065	04/30	1100
Third Highest	.063	05/18	1000
Fourth Highest	.062	05/01	1000

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>GREEN VALLEY</b>	
<b>AQS code:</b>	040191030	
<b>Address:</b>	601 N. La Canada Drive	
<b>Latitude/ Longitude:</b>	31.87952 / -110.996440	
<b>Elevation:</b>	2638	
<b>Method:</b>	047	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental ultra violet radiation absorption	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	Special Purpose	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8692	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	3.1 meters above the ground on a shelter	
<b>Probe material / Residence time:</b>	FEP Teflon / 3.5 seconds	
<b>Surrounding landscape:</b>	Dirt, sparse desert vegetation	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a residential / commercial area. Open pit copper mines and tailings ponds are located four kilometers to the west of the community.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	100 meters west of La Canada (2006 ADT of 15,200)
	<b>2</b>	0.5 kilometers west of Interstate 19 (2006 ADT of 32,000).
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site is fifty kilometers south of Downtown Tucson in the retirement community of Green Valley. This site was initially established in April of 2002 as part of the Environmental Monitoring for Public Access and Community Tracking (EMPACT) program. Pima County began reporting the ozone data to EPA July, 2003.

## OZONE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### GREEN VALLEY: AIRS # 040191030



**Annual summary statistics: NAAQS: 0.075 ppm 4<sup>th</sup> highest 8- Hour Average**

One – hour average concentrations	ppm	Date	Hour
Highest	.080	03/23	1400
Second Highest	.073	04/05	2000

Eight – hour average concentrations	ppm	Date	Hour (begin)
Highest	.067	03/23	1100
Second Highest	.066	04/26	0900
Third Highest	.065	04/05	1300
Fourth Highest	.065	05/18	1000

## NITROGEN DIOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

Nitrogen dioxide (NO<sub>2</sub>) is currently measured at two locations in Tucson. The Environmental Protection Agency has revised the NO<sub>2</sub> requirements. **40 CFR 58, app. D, 4.3**, design criteria states that there are no minimum requirements for the number of NO<sub>2</sub> monitoring sites.

**2009 NO<sub>2</sub> Design Criteria  
Table 13**

<b>MSA Population Category</b>	<b># of Required NO<sub>2</sub> Monitors</b>	<b># of NO<sub>2</sub> Monitors</b>
500,000 – 1,000,000	No Requirement	1 SLAMS Monitor
500,000 – 1,000,000	No Requirement	1 SP Monitor

#### Historical Nitrogen Dioxide Monitoring

Nitrogen dioxide levels remain well within federal standards. The Craycroft and 22<sup>nd</sup> St. monitor has been operational since 1973, measuring typical neighborhood NO<sub>2</sub> concentrations. Much of the data has been used in studies measuring the effects of NO<sub>2</sub> as a precursor to ozone formation.

A NO<sub>x</sub> analyzer was operating at the Pomona site from 1988 until 1996, when the site was closed. The re-establishment of the site at the Children’s Park location in May, 1998, allows for monitoring on the north side of Tucson and in the lower valley area.

A NO<sub>x</sub> analyzer was operating at the Downtown site until early 1989. From 1995 to December 2001, NO<sub>x</sub> monitoring was conducted at Saguaro National Park East to establish baseline conditions in a Class I Wilderness Area.

#### Quality Assurance for NO<sub>2</sub>

All data quality assessment requirements outlined in **40 CFR 58, app. A**, have been met for 2009. The requirements include precision checks every other week with a check gas range between 0.08 and 0.10 ppm and annual internal audits for accuracy with three point check levels between 0.03 - 0.08 ppm, 0.15 – 0.20 ppm and 0.35 – 0.45ppm . All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 14**

<b>Nitrogen Dioxide Audit Dates 2009</b>	
Craycroft & 22 <sup>nd</sup> St.	06/17, 12/30
Children’s Park	03/11, 09/17

NITROGEN DIOXIDE MONITORING NETWORK

2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>	
<b>AQS code:</b>	040191011	
<b>Address:</b>	1237 S. Beverly Avenue, Tucson, AZ.	
<b>Latitude/ Longitude:</b>	32.204420 / -110878150	
<b>Elevation:</b>	2582	
<b>Method:</b>	074	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental chemiluminescence	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8674	
<b>Number /dates of exceedances in 2009:</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.1 meters above the ground on the roof of a shelter located in a city water well site	
<b>Probe material / Residence time:</b>	FEP Teflon / 4.4 seconds	
<b>Surrounding landscape:</b>	Dirt, ephemeral weeds	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a predominately residential eastside area with commercial activity lining nearby arterial routes. There is a large covered water reservoir north of the location.	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	260 meters west is Craycroft Road with 2006 ADT of 33,800
	<b>2</b>	260 meters north is 22 <sup>nd</sup> Street with a 2004 ADT of 52,400
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site is one of the oldest in the monitoring network, originally established in 1973, and operated continuously to the present.

# NITROGEN DIOXIDE MONITORING NETWORK

## 2009 Ambient Air Monitoring Network Plan

**22<sup>ND</sup> STREET & CRAYCROFT: AIRS # 040191011**



**Annual summary statistics:** NAAQS: 0.100 ppm 1- Hour Average, 0.053 ppm Annual Average

One – hour average concentrations	ppm	Date	Hour
Highest	.050	02/02	2000
Second Highest	.047	01/30	2200

NITROGEN DIOXIDE MONITORING NETWORK

**2009 Ambient Air Monitoring Network Plan**

<b>Site Name:</b>	<b>CHILDREN'S PARK</b>						
<b>AQS code:</b>	040191028						
<b>Address:</b>	400 W. River Road, Tucson, AZ						
<b>Latitude/ Longitude:</b>	32.295150 / -110.982300						
<b>Elevation:</b>	2286						
<b>Method:</b>	099						
<b>Number of monitors:</b>	1						
<b>Type of monitor:</b>	Instrumental chemiluminescence						
<b>Monitoring site type:</b>	Highest Concentration						
<b>Classification:</b>	Special Purpose						
<b>Scale:</b>	Urban						
<b>Number of hourly observations:</b>	8383						
<b>Number /dates of exceedances in 2009:</b>	0						
<b>Historical exceedances:</b>							
<b>Sampling frequency:</b>	Continuous						
<b>Probe height:</b>	4.25 meters above the ground on a shelter located in a city water well site						
<b>Probe material / Residence time:</b>	FEP Teflon / 5.1 seconds						
<b>Surrounding landscape:</b>	Gravel in walled compound, dirt parking lot, dry river bed						
<b>Degrees of unrestricted air flow:</b>	270						
<b>Location description:</b>	This site is located at the confluence of the Rillito River and Pima Wash, a natural low spot in the local topography. Single - family residences and a popular county park with exercise trails extend to the north, northwest, and west, respectively. Heavy commercial usage dominates to the south and east, including large shopping malls and automobile dealerships						
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<table border="1"> <tr> <td>1</td> <td>State Route 77 runs north – south 0.5 kilometers to the east with a 2006 ADT of 52,000</td> </tr> <tr> <td>2</td> <td>River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400</td> </tr> <tr> <td></td> <td></td> </tr> </table>	1	State Route 77 runs north – south 0.5 kilometers to the east with a 2006 ADT of 52,000	2	River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400		
1	State Route 77 runs north – south 0.5 kilometers to the east with a 2006 ADT of 52,000						
2	River Road runs east – west 0.5 kilometers to the north, with a 2006 ADT of 34,400						
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes						

**Comments:** The site began monitoring for Nitrogen Dioxide in May, 1998, and is a relocation (1.5 kilometers, northeast) of the Pomona site.

## NITROGEN DIOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

#### **CHILDREN'S PARK: AIRS # 040191028**



**Annual summary statistics:** NAAQS: 0.100 ppm 1- Hour Average, 0.053 ppm Annual Average

One – hour average concentrations	ppm	Date	Hour
Highest	.043	11/10	1800
Second Highest	.042	03/25	2200

## SULFUR DIOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

Sulfur Dioxide (SO<sub>2</sub>) is currently being monitored at one location in Pima County. The Environmental Protection Agency has revised the SO<sub>2</sub> requirements. The design criteria indicated in **40 CFR 58, app. D, 4.4**, states that there are no minimum requirements for the number of SO<sub>2</sub> monitoring sites.

**2009 SO<sub>2</sub> Design Criteria  
Table 15**

MSA Population Category	# of Required SO <sub>2</sub> Monitors	# of SO <sub>2</sub> Monitors
500,000 – 1,000,000	No Requirement	1 SLAMS Monitor

### Historical Sulfur Dioxide Monitoring

Ambient concentrations of sulfur dioxide (SO<sub>2</sub>) in Tucson have historically remained well below all federal standards, and in recent years have been extremely low (approaching the noise level of the instrumentation). SO<sub>2</sub> is not considered a problem in Pima County. The only major stationary sources of SO<sub>2</sub> possibly affecting ambient concentrations in the Tucson air planning area are the coal burning generators at the Irvington Road power plant operated by Tucson Electric Power.

#### Quality Assurance for SO<sub>2</sub>

All data quality assessment requirements outlined in **40 CFR 58, app. A**, have been met for 2009. The requirements include precision checks every other week with a check gas range between 0.08 and 0.10 ppm and annual internal audits for accuracy with three point check levels between 0.03 - 0.08 ppm, 0.15 – 0.20 ppm and 0.35 – 0.45ppm . All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 16**

<b>Sulfure Dioxide Audit Dates 2009</b>
Craycroft & 22 <sup>nd</sup> St. 06/17, 12/30

## SULFUR DIOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

<b>Site Name:</b>	<b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>	
<b>AQS code:</b>	040191011	
<b>Address:</b>	1237 S. Beverly Avenue, Tucson, AZ	
<b>Latitude/ Longitude:</b>	32.204420 / -110878150	
<b>Elevation:</b>	2582	
<b>Method:</b>	060	
<b>Number of monitors:</b>	1	
<b>Type of monitor:</b>	Instrumental Pulsed Fluorescent	
<b>Monitoring site type:</b>	Population Exposure	
<b>Classification:</b>	SLAMS	
<b>Scale:</b>	Neighborhood	
<b>Number of hourly observations:</b>	8702	
<b>Number /dates of exceedances in 2009 :</b>	0	
<b>Historical exceedances:</b>		
<b>Sampling frequency:</b>	Continuous	
<b>Probe height:</b>	4.1 meters above the ground on the roof of a shelter located in a city water well site	
<b>Probe material / Residence time:</b>	FEP Teflon / 7.3 seconds	
<b>Surrounding landscape:</b>	Dirt, ephemeral weeds	
<b>Degrees of unrestricted air flow:</b>	360	
<b>Location description:</b>	This site is situated in a predominately residential eastside area with commercial activity lining nearby arterial routes. There is a large covered water reservoir north of the location. There are no significant local sources of SO <sub>2</sub> in the area	
<b>Nearest roads distance &amp; direction to monitor /ADT:</b>	<b>1</b>	260 meters west is Craycroft Road with 2006 ADT of 33,800
	<b>2</b>	260 meters north is 22 <sup>nd</sup> Street with a 2004 ADT of 52,400
<b>Site meets 40 CFR 58, Appx. A,C,D,E</b>	Yes	

**Comments:** This site is one of the oldest in the monitoring network, originally established in 1973, and operated continuously to the present.

## SULFUR DIOXIDE MONITORING NETWORK

### 2009 Ambient Air Monitoring Network Plan

**22<sup>ND</sup> STREET & CRAYCROFT: AIRS # 040191011**



**Annual summary statistics:** NAAQS: 0.14 ppm 24- Hour Average, 0.5ppm 3-Hour Average

Twenty Four – hour average concentrations	ppm	Date	Hour
Highest	.002	01/08	2300
Second Highest	.002	10/27	2300

Three – hour average concentrations	ppm	Date	Hour
Highest	.005	10/27	2000
Second Highest	.004	11/12	2000

## **LEAD MONITORING NETWORK**

### **2009 Ambient Air Monitoring Network Plan**

Lead sampling and analysis was discontinued at the end of March, 1997, in Pima County. The Environmental Protection Agency regulations allowing for the cessation of ambient lead monitoring in most areas of the country, except in areas with stationary sources of lead. Most urban areas have seen a dramatic decrease in ambient lead levels since the phase out and ban of lead in gasoline.

On October 15, 2008 EPA strengthened the lead standard. Research and technology has shown that adverse health effects occur at much lower levels of lead in blood than previously thought. Children are particularly vulnerable to the effects of lead. The primary standard of 1.5 ug/m<sup>3</sup> has been lowered to 0.15ug/m<sup>3</sup>, measured as total suspended particles (TSP). The secondary standard is identical to the primary standard. According to the 2005 National Air Emissions Inventory (NEI) from EPA, Pima County has no sources of lead of one ton or more. This means that Pima County will be required to perform area monitoring only, which will be done at the Children's Park location. Monitoring is anticipated to commence prior to January 2011.

#### **Historical Lead Monitoring**

Lead concentrations are extremely low in Tucson. Lead monitoring began in Pima County in 1975 at eight TSP sampling locations. In August, 1978, lead analyses were discontinued at all but two sites. Magnetic Observatory (University of Arizona) and Prince Road were selected to represent a neighborhood site and roadway site, respectively. Lead sampling was started at a third site (Broadway & Swan) in January 1983.

Lead analysis at Magnetic Observatory was discontinued in 1983 due to lack of detectable levels of lead. A TSP sampler was installed at South Tucson in 1991 for purposes of lead analysis. This site, along with the other two remaining sites, (Prince Road and Broadway & Swan) adequately fulfilled the siting criteria for measuring potential highest urban concentrations of lead in the particulate monitoring network.

In March of 1992 the Broadway & Swan lead analysis was discontinued and the TSP samplers from the South Tucson and the University of Arizona sites were moved to the 22<sup>nd</sup> & Craycroft site. 22<sup>nd</sup> & Craycroft and Prince Road sites remained until March of 1997.