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June 27, 2012

Mr. Matthew Lakin  
Air Quality Analysis Office Chief  
U.S. Environmental Protection Agency Region 9  
75 Hawthorne Street  
San Francisco, CA 94105

Dear Mr. Lakin:

In accordance with 40 CFR Part 58, Pima County Department of Environmental Quality has enclosed the 2011 Ambient Air Monitoring Network Plan. The 2011 Ambient Air Monitoring Network Plan was made available for public inspection via the Pima County Department of Environmental Quality web site on May 25, 2012. During the thirty day inspection period, there were no comments received from the public.

If you have any questions, please contact Ted Gould, Environmental Specialist for the Monitoring Division at 520-243-7360.

Sincerely,

A handwritten signature in cursive script that reads "Ursula Kramer".

Ursula Kramer  
Director

Enc.: 2011 Ambient Air Monitoring Network Plan

Cc: Michael Flagg, EPA  
Fletcher Clover, EPA  
Ted Gould, PDEQ  
Tom Coffin, PDEQ  
Deborah Jentoft, PDEQ

2011  
Ambient Air Monitoring Network Plan

Pima County Department of Environmental Quality  
33 North Stone, Suite 700  
Tucson, Arizona 85701  
AQ 379



# 2011 Ambient Air Monitoring Network Plan

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## I. INTRODUCTION

### 2011 Ambient Air Monitoring Network Plan

This document constitutes the 2011 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 2011 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.

Pima County has a designated NCore site at the Children's Park location, which also monitors for reactive oxides of nitrogen (NO<sub>y</sub>), particulate matter coarse (PM<sub>10-2.5</sub>), speciated particulate matter and lead.

#### **Schedule of EPA's review of criteria pollutants:**

Primary SO<sub>2</sub> NAAQS - final ruling June 22, 2010  
Primary NO<sub>2</sub> NAAQS - final ruling February 9, 2010  
O<sub>3</sub> NAAQS- review and proposed rule scheduled for October, 2013  
Secondary NO<sub>2</sub> and SO<sub>2</sub> NAAQS- proposal August 1, 2011  
Primary CO NAAQS final ruling August 15, 2011  
Lead -revised monitoring requirements December 14, 2010  
Particulate Matter NAAQS- under review

**PDEQ made the following network modifications in 2011:**

- ◆ Began reporting data from PM<sub>2.5</sub> continuous Particulate Matter monitor and Relative Humidity sensor at the Children's Park NCore site.
- ◆ Began NO<sub>2</sub> one - point precision checks conforming to 40CFR58 App. A, Section 3.2.1 at the 22<sup>nd</sup> and Craycroft site.
- ◆ 22<sup>nd</sup> and Craycroft SO<sub>2</sub> monitoring was discontinued December 31, 2010 and replaced by SO<sub>2</sub> monitoring at the Children's Park NCore site.

**PDEQ's anticipated modifications to network in 2012:**

- ◆ Begin lead analysis at the Children's Park NCore site.
- ◆ Install a digital data acquisition loggers at the 22<sup>nd</sup> and Craycroft and the 22<sup>nd</sup> and Alvernon sites.
- ◆ Install a dilution calibration system at the 22<sup>nd</sup> and Alvernon site to facilitate CO one - point precision check concentrations contained in 40CFR58 App. A, Section 3.2.1
- ◆ Begin CO one – point precision checks conforming to 40CFR58 App. A, Section 3.2.1 at the 22<sup>nd</sup> and Craycroft site.

## II. BACKGROUND

Pima County Air Quality Control District met all the National Ambient Air Quality Standards (NAAQS) in 2011. 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. 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 2010 census shows Pima County population at 980,263 and the city of Tucson population at 520,116. **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.

### 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.

## **2011 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.

## 2011 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).

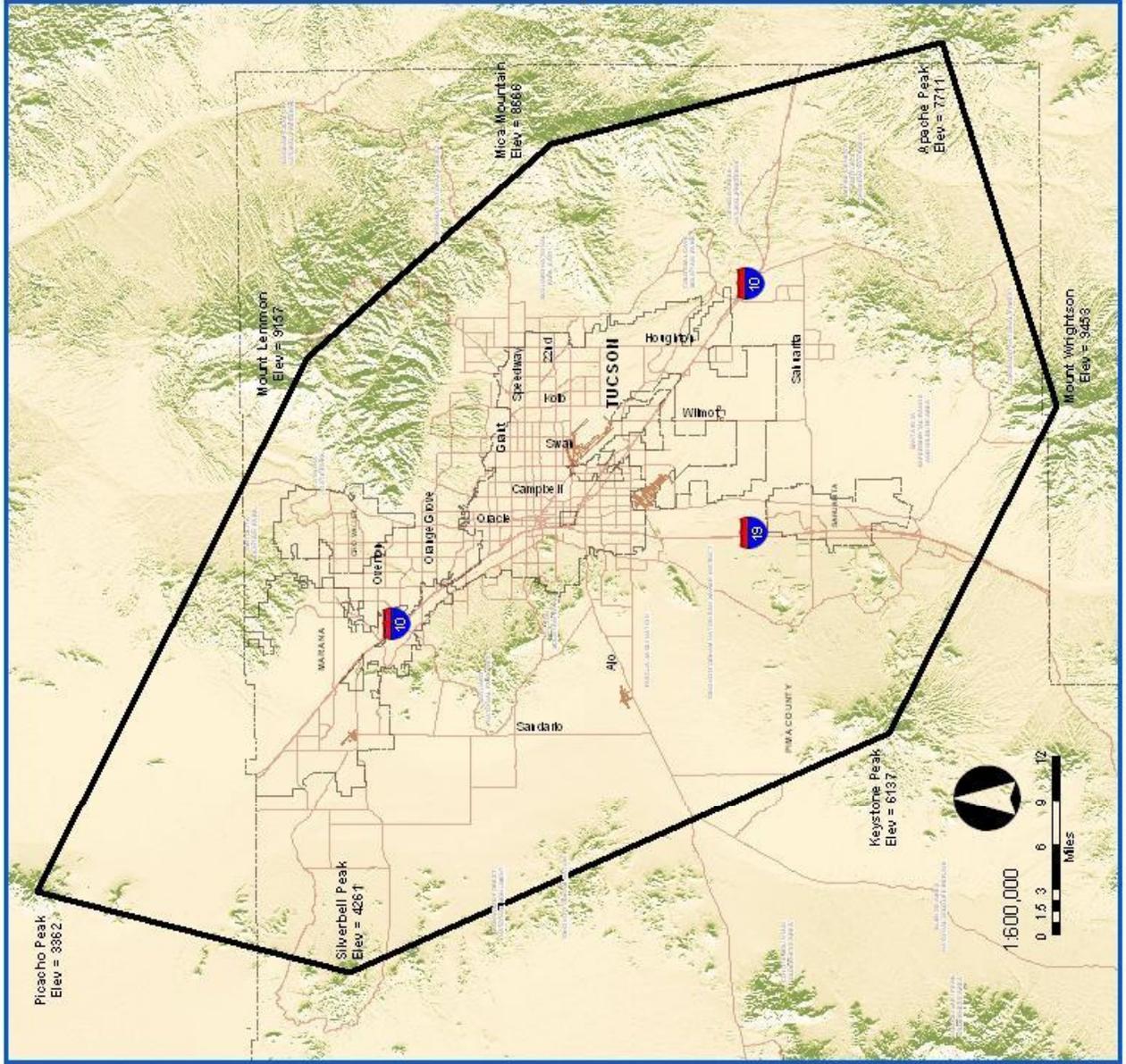
**Table 1**

| 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: March 2012

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.



Prepared By  
Pima County Department  
of  
Environmental Quality



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

**2011 Ambient Air Monitoring Network Plan**

Active Particulate Monitoring Sites for 2011

**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              |
| 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<br>NCore |
| 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

## 2011 Ambient Air Monitoring Network Plan

Active Gaseous Pollutant Monitoring Sites for 2011

**Table 3**

| Map # | Pollutant |                |                 |                 |                 | Address                      | Site Name                      |
|-------|-----------|----------------|-----------------|-----------------|-----------------|------------------------------|--------------------------------|
| 2     | CO        | O <sub>3</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> | SO <sub>2</sub> | NO <sub>2</sub> | NO <sub>Y</sub> | 400 W. River Rd.             | Children's Park NCore          |
| 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,<br>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

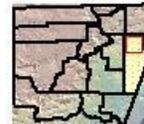
# Pima County Monitoring Sites

- 2 - 22nd / Craycroft
- 3 - 22nd / Alvimon
- 4 - Geronimo
- 5 - South Tucson
- 6 - Prince Road
- 8 - Corona de Tucson
- 9 - Santa Clara
- 10 - Green Valley
- 11 - Children's Park NCore
- 12 - Orange Grove
- 13 - Tangerine
- 14 - Rose Elementary
- 15 - Coachline
- 16 - Cherry / Glenn
- 17 - Fairgrounds
- 18 - Saguaro National Park East
- 23 - Golf Links / Kolb
- 24 - Green Valley Fire District

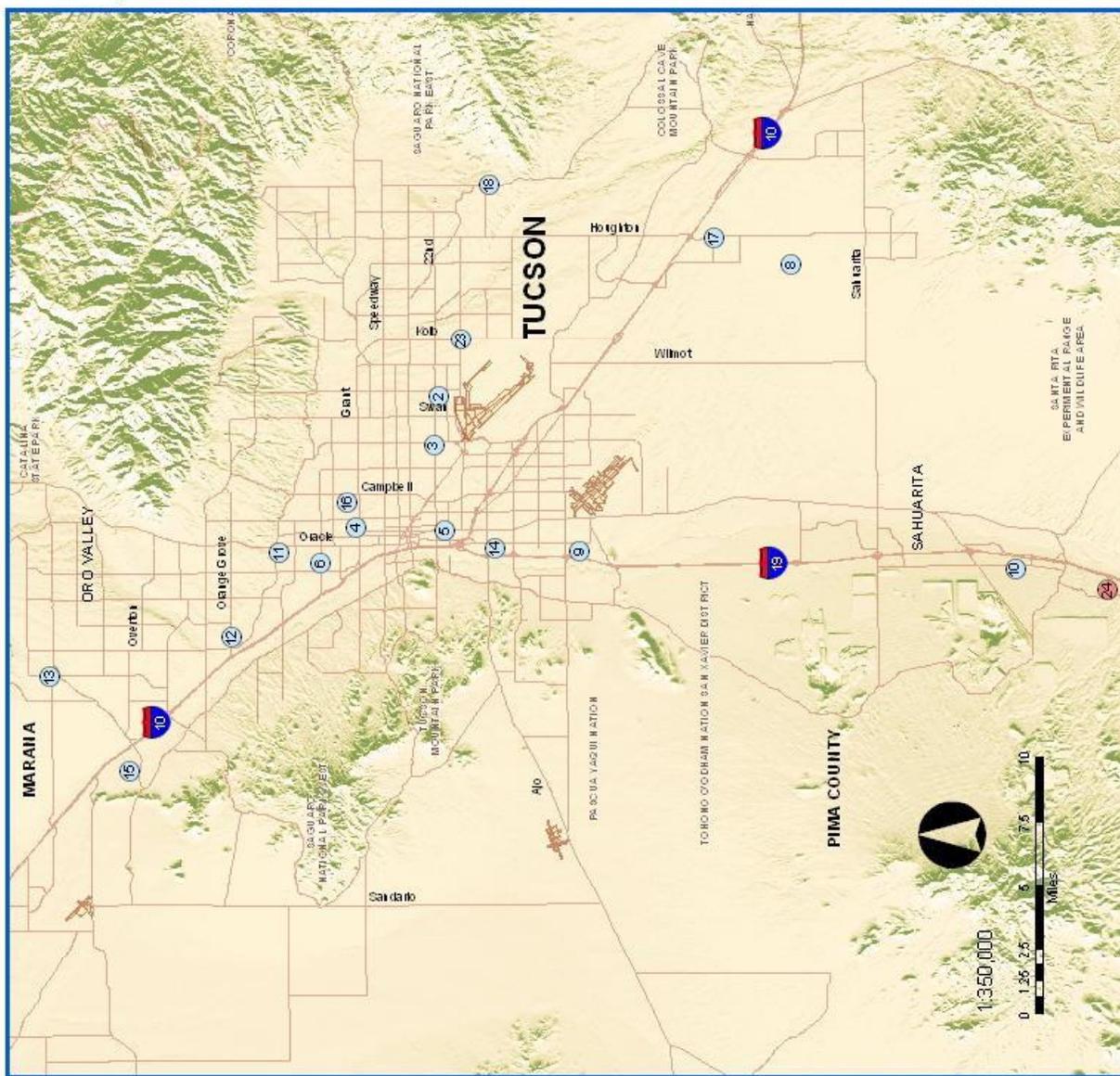
-  PDEQ Monitoring Sites
-  Green Valley Community Site
-  Major Streets

Revised: March 2012

**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.



Prepared By  
Pima County Department  
of  
Environmental Quality



## 2011 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) | SMPL SPATIAL SCALE (h) | SMPL FREQ (i)   | POC (j) MONITORING SITE TYPE (h) |
|--|--------------|---------------|--------------------|--------------------|------------|----------------|---------------------|------------------------|---|----------------------------------|
| 22ND & CRAYCROFT<br>1237 S. BEVERLY AVE.   | 004-019-1011 | 42101         | SLAMS              | Jul-73<br>PRESENT  | 54         | 2582           | 4.1                 | NEIGHBORHOOD           | CONTINUOUS  | 1 POPULATION EXPOSURE            |
| 22ND & ALVERNON<br>3895 E. 22ND STREET     | 004-019-1014 | 42101         | SLAMS              | Mar-75<br>PRESENT  | 54         | 2516           | 3.4                 | MICROSCALE             | CONTINUOUS  | 1 HIGHEST CONCENTRATION          |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 42101         | SP<br>NCore        | Oct-98<br>PRESENT  | 554        | 2286           | 4.25                | NEIGHBORHOOD           | CONTINUOUS  | 1 POPULATION EXPOSURE            |
| CHERRY & GLENN<br>2745 N. CHERRY AVE.      | 004-019-1021 | 42101         | SP                 | Feb-89<br>PRESENT  | 54         | 2400           | 4.9                 | NEIGHBORHOOD           | Cont/Seasonal<br>Jan. 1 – March 31<br>Oct. 1- Dec. 31 | 1 POPULATION EXPOSURE            |
| GOLF LINKS & KOLB<br>2601 SOUTH KOLB       | 004-019-1031 | 42101         | SP                 | Sept-02<br>PRESENT | 093        | 2561           | 3                   | MICROSCALE             | Cont/Seasonal<br>Jan. 1 – March 31<br>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) | SMPL SPATIAL SCALE (h) | SMPL FREQ (i) | POC (j) MONITORING SITE TYPE (h) |
|--|--------------|---------------|--------------------|-------------------|------------|----------------|---------------------|------------------------|---------------|----------------------------------|
| 22ND & CRAYCROFT<br>1237 S. BEVERLY AVE.   | 004-019-1011 | 42602         | SLAMS              | Jan-73<br>PRESENT | 74         | 2582           | 4.1                 | NEIGHBORHOOD           | CONTINUOUS    | 1 POPULATION EXPOSURE            |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 42602         | Proposed<br>NCore  | May-98<br>PRESENT | 099/090    | 2286           | 4.25                | NEIGHBORHOOD           | CONTINUOUS    | 1 HIGHEST CONCENTRATION          |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 42600         | Proposed<br>NCore  | Oct-10<br>PRESENT | 574        | 2286           | 4.25                | NEIGHBORHOOD           | CONTINUOUS    | 1 POPULATION EXPOSURE            |

Key located on page 15

**2011 Ambient Air Monitoring Network Summary Table  
SULFUR DIOXIDE -PIMA COUNTY MONITORING NETWORK**

| SITE NAME AND LOCATION                     | SITE ID (a)  | PARAMETER CLASSIFICATION (b) | DATES             | METHOD (e) | ELEV. FEET (f) | SMPH HEIGHT (M) (g) | SPATIAL SCALE (h) | SMPH FREQ (i) | POC (j) MONITORING SITE TYPE (h) |
|--|--------------|------------------------------|-------------------|------------|----------------|---------------------|-------------------|---------------|----------------------------------|
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 44201<br>Proposed NCore      | Oct-10<br>PRESENT | 560        | 2286           | 4.25                | NEIGHBORHOOD      | CONTINUOUS    | 1<br>POPULATION EXPOSURE         |

**OZONE -PIMA COUNTY MONITORING NETWORK**

| SITE NAME AND LOCATION                             | SITE ID (a)  | PARAMETER CLASSIFICATION (b) | DATES              | METHOD (e) | ELEV. FEET (f) | SMPH HEIGHT (M) (g) | SPATIAL SCALE (h) | SMPH FREQ (i) | POC (j) MONITORING SITE TYPE (h) |
|--|--------------|------------------------------|--------------------|------------|----------------|---------------------|-------------------|---------------|----------------------------------|
| 22ND & CRAYCROFT<br>1237 S. BEVERLY AVE.           | 004-019-1011 | 44201<br>SLAMS               | July-73<br>PRESENT | 087        | 2582           | 4.1                 | NEIGHBORHOOD      | CONTINUOUS    | 1<br>POPULATION EXPOSURE         |
| GREEN VALLEY<br>601 N. LA CANADA DR.               | 004-019-1030 | 44201<br>SP                  | July-03<br>PRESENT | 047        | 2910           | 3.1                 | NEIGHBORHOOD      | CONTINUOUS    | 1<br>POPULATION EXPOSURE         |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD         | 004-019-1028 | 44201<br>SLAMS NCore         | Sep-87<br>PRESENT  | 047        | 2286           | 4.25                | NEIGHBORHOOD      | CONTINUOUS    | 1<br>POPULATION EXPOSURE         |
| TANGERINE<br>12101 N. CAMINO DE OESTE              | 004-019-1018 | 44201<br>SP                  | Oct-89<br>PRESENT  | 047        | 2638           | 3.75                | URBAN             | CONTINUOUS    | 1<br>HIGHEST CONCENTRATION       |
| ROSE ELEMENTARY<br>710 W. MICHIGAN                 | 004-019-1032 | 44201<br>SP                  | July-03<br>PRESENT | 087        | 2387           | 4.1                 | NEIGHBORHOOD      | CONTINUOUS    | 1<br>POPULATION EXPOSURE         |
| COACHLINE<br>9597 N. COACHLINE BLVD                | 004-019-1034 | 44201<br>SP                  | July-03<br>PRESENT | 087        | 2110           | 3.1                 | NEIGHBORHOOD      | CONTINUOUS    | 1<br>POPULATION EXPOSURE         |
| FAIRGROUNDS<br>11330 S. HOUGHTON RD.               | 004-019-1020 | 44201<br>SP                  | Oct-89<br>PRESENT  | 047/087    | 3078           | 3.6                 | URBAN             | CONTINUOUS    | 1<br>NATURAL BACKGROUND          |
| SAGUARO NATIONAL PARK<br>3905 S. OLD SPANISH TRAIL | 004-019-0021 | 44201<br>SLAMS               | June-82<br>PRESENT | 047        | 3089           | 4.1                 | NEIGHBORHOOD      | CONTINUOUS    | 1<br>HIGHEST CONCENTRATION       |

Key located on page 15

## 2011 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) | SMPH (M) (g) | SPATIAL SCALE (h) | SMPL FREQ (i)                      | POC (j) | MONITORING SITE TYPE (h) |
|--|--------------|---------------|-------------------------------|--------------------|------------|----------------|--------------|-------------------|------------------------------------|---------|--------------------------|
| GERONIMO<br>2498 N. GERONIMO               | 04-019-1113  | 81102         | SP                            | June-07<br>PRESENT | 079        | 2452           | 4.6          | NEIGHBORHOOD      | CONTINUOUS                         | 1       | POPULATION EXPOSURE      |
| SOUTH TUCSON<br>1601 S. 6TH AVE.           | 04-019-1001  | 81102         | SLAMS                         | Sep-88<br>PRESENT  | 127        | 2420           | 6.9          | NEIGHBORHOOD      | 1 DAY<br>collocated every<br>6 day | 1       | POPULATION EXPOSURE      |
| PRINCE ROAD<br>1016 W. PRINCE RD.          | 04-019-1009  | 81102         | SLAMS                         | JUL-87<br>PRESENT  | 126        | 2315           | 4.6          | MICROSCALE        | 6 DAY                              | 1       | SOURCE IMPACT            |
| CORONA DE TUCSON<br>22000 S. HOUGHTON RD.  | 04-019-0008  | 81102         | SLAMS                         | Mar-87<br>PRESENT  | 126        | 3078           | 2.1          | REGIONAL          | 6 DAY                              | 1       | BACKGROUND               |
| SANTA CLARA<br>6910 S. SANTA CLARA AVE.    | 04-019-1026  | 81102         | SP                            | JUL-94<br>PRESENT  | 126        | 2540           | 6.45         | NEIGHBORHOOD      | 6 DAY                              | 1       | POPULATION EXPOSURE      |
| GREEN VALLEY<br>601 N. LA CANADA DR.       | 04-019-1030  | 81102         | SP                            | Feb-01<br>PRESENT  | 079        | 2910           | 4.8          | NEIGHBORHOOD      | CONTINUOUS                         | 1       | POPULATION EXPOSURE      |
| ORANGE GROVE<br>3401 W. ORANGE GROVE RD.   | 04-019-0011  | 81102         | SLAMS                         | Jan-85<br>PRESENT  | 127        | 2234           | 2.65         | NEIGHBORHOOD      | 1 DAY<br>collocated every<br>6 day | 2       | HIGHEST CONCENTRATION    |
| TANGERINE<br>12101 N. CAMINO DE OESTE      | 04-019-1018  | 81102         | SP                            | Jan-84<br>PRESENT  | 126        | 2638           | 4.5          | URBAN             | 6 DAY                              | 1       | BACKGROUND               |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 86101         | Proposed<br>NCore<br>PM10-2.5 | Jan-11<br>PRESENT  | 176        | 2286           | 3.1          | NEIGHBORHOOD      | 3 DAY                              | 1       | POPULATION EXPOSURE      |

Key located on page 15

## 2011 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) | SMPH HEIGHT (M) (g) | SPATIAL SCALE (h) | SMPH FREQ (i)                       | POC (j) | MONITORING SITE TYPE (h) |
|--|--------------|---------------|---------------------|--------------------|------------|----------------|---------------------|-------------------|-------------------------------------|---------|--------------------------|
| GERONIMO<br>2498 N. GERONIMO               | 004-019-1113 | 88501         | SP                  | July-03<br>PRESENT | 733        | 2452           | 4.6                 | NEIGHBORHOOD      | CONTINUOUS                          | 3       | POPULATION EXPOSURE      |
| GREEN VALLEY<br>601 N. LA CANADA DR.       | 004-019-1030 | 88501         | SP                  | July-03<br>PRESENT | 733        | 2910           | 4.8                 | NEIGHBORHOOD      | CONTINUOUS                          | 3       | POPULATION EXPOSURE      |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 88101         | SLAMS NCore         | Jan-99<br>PRESENT  | 118        | 2286           | 3.1                 | NEIGHBORHOOD      | 3 DAY<br>collocated every<br>12 day | 1       | POPULATION EXPOSURE      |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 88502         | NCore<br>SPECIATION | Feb-02<br>PRESENT  | 810        | 2286           | 3.0                 |                   | 3 DAY                               | 5       | POPULATION EXPOSURE      |
| CHILDREN'S PARK NCore<br>400 W. RIVER ROAD | 004-019-1028 | 88101         | Proposed NCore      | Jan-11<br>PRESENT  | 170        | 2286           | 3.1                 | NEIGHBORHOOD      | CONTINUOUS                          | 3       | POPULATION EXPOSURE      |
| ORANGE GROVE<br>3401 W. ORANGE GROVE RD.   | 004-019-0011 | 88101         | SLAMS               | Jan-99<br>PRESENT  | 118        | 2234           | 2.65                | NEIGHBORHOOD      | 3 DAY                               | 1       | POPULATION EXPOSURE      |
| ROSE ELEMENTARY<br>710 W. MICHIGAN         | 004-019-1032 | 88501         | SP                  | July-03<br>PRESENT | 733        | 2387           | 4.9                 | NEIGHBORHOOD      | CONTINUOUS                          | 3       | POPULATION EXPOSURE      |
| COACHLINE<br>9597 N. COACHLINE BLVD        | 004-019-1034 | 88501         | SP                  | July-03<br>PRESENT | 733        | 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 - SMPH 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 2011 Air Quality System (AQS) data.

## IV. CURRENT MONITORING NETWORK EVALUATIONS

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

#### 2011 Ambient Air Monitoring Network Plan

The PDEQ PM<sub>10</sub> network consists of nine monitoring sites in eastern Pima County, Arizona. The 2011 network used several different types of PM<sub>10</sub> samplers: R& P Partisol 2000, R& P Partisol-Plus 2025 Sequential, and TEOM 1400. **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 2011.

**2011 PM<sub>10</sub> Design Criteria**  
**Table 5**

| Population Pima County 2010 Census | MSA Tucson Population Category | Design Value (2009-2011) | PM <sub>10</sub> Monitors # Required | PM <sub>10</sub> Monitors # Operating | Max Concentration site | Max Concentration (µg/m <sup>3</sup> ) |
|------------------------------------|--------------------------------|--------------------------|--------------------------------------|---------------------------------------|------------------------|--|
| 980,263                            | 500,000 – 1,000,000            | 0.3                      | Requires 2-4 SLAMS monitors          | 4 SLAMS monitors                      | Orange Grove 040190011 | 270                                    |
|                                    |                                |                          |                                      |                                       | South Tucson 040191001 | 184                                    |
|                                    |                                |                          |                                      |                                       | Geronimo 040191113     | 237                                    |
|                                    |                                |                          |                                      |                                       |                        |  |
|                                    |                                |                          | No requirement for SP                | 4 SP monitors                         |                        |  |

#### Considering Flagged Exceptional Events

| Population Pima County 2010 Census | MSA Tucson Population Category | Design Value (2009-2011) | PM <sub>10</sub> Monitors # Required | PM <sub>10</sub> Monitors # Operating | Max Concentration site | Max Concentration (µg/m <sup>3</sup> ) |
|------------------------------------|--------------------------------|--------------------------|--------------------------------------|---------------------------------------|------------------------|--|
| 980,263                            | 500,000 – 1,000,000            | 0                        | Requires 2-4 SLAMS monitors          | 4 SLAMS monitors                      | South Tucson 040191001 | 127                                    |

#### 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

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

### 2011 Ambient Air Monitoring Network Plan

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 2011. 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.

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 2011</b>  |
|------------------------|--|------------------|---|
| Flow rate verification | Met One BAM 1020<br>R&P TEOM 1400                            | Weekly           |   |
| Flow Rate Audit        | TEOM 1400AB  | Quarterly        | Green Valley 03/09, 06/27, 09/28,12/20<br>Geronimo 03/10, 06/29, 09/28,12/29  |
| Flow rate verification | R& P Partisol 2000,<br>R& P Partisol-Plus<br>2025 Sequential | Monthly          |   |
| Flow Rate Audit        | R& P Partisol 2000,<br>R& P Partisol-Plus<br>2025 Sequential | Quarterly        | Corona de Tucson 03/23, 06/17, 09/25, 12/14<br>Santa Clara 03/09, 06/10, 09/22, 12/15<br>Prince Road 03/08, 06/09, 09/21,12/15<br>Tangerine 03/08, 06/09, 09/21,12/15<br>South Tucson 03/09, 06/10, 09/22, 12/27<br>South Tucson (co-located) 03/09, 06/10, 09/22, 12/27<br>Orange Grove 03/08, 06/09, 09/21, 12/15<br>Orange Grove (co-located) 03/08, 06/09, 09/21, 12/15<br>Children's Park NCore 03/08, 06/09, 09/22, 12/22 |
| NPAP Audit             |  |                  | None for 2011   |

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

### 2011 Ambient Air Monitoring Network Plan

Table 7

| Collocated PM <sub>10</sub> Monitors |                                 |                    |                       |
|--------------------------------------|---------------------------------|--------------------|-----------------------|
| Method                               | # Required Collocation Monitors | # Primary Monitors | # Collocated Monitors |
| 81102                                | 1                               | 8                  | 2                     |
|                                      |                                 |                    |                       |

#### 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

### 2011 Ambient Air Monitoring Network Plan

|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>GREEN VALLEY</b>  |  |
| <b>AQS ID / POC</b>  | 040191030 / 1  |  |
| <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 Code</b>   | 079  |  |
| <b>Number of monitors</b>  | 1  |  |
| <b>Parameter code</b>  | 81102  |  |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison   |  |
| <b>Site Type</b>   | Population Exposure  |  |
| <b>Instrument Manufacturer and model</b>                             | Thermo Scientific TEOM 1400AB  |  |
| <b>FRM/FEM/ARM/other</b>   | FEM  |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ  |  |
| <b>Analytical Lab</b>  | PDEQ   |  |
| <b>Monitor Type</b>  | Special Purpose  |  |
| <b>Scale</b>   | Neighborhood   |  |
| <b>Number of daily observations</b>                                  | 363  |  |
| <b>Annual arithmetic mean</b>  | 17.9 µg/m <sup>3</sup>   |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |  |
| <b>Historical exceedances</b>  |  |  |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | n/a  |  |
| <b>Distance from trees</b>   | 7.0 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 100 meters west of La Canada /2010 ADT of 11,000         |
|  | <b>2</b>   | 0.5 kilometers west of Interstate 19 /2008 ADT of 31,000 |
|  |  |  |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |  |

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

### 2011 Ambient Air Monitoring Network Plan

**GREEN VALLEY: AIRS # 040191030**



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

| Year | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|------|----------------|--------------------|------------------------------------|
| 2011 | 17.9           | 75                 | 70                                 |

**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 population exposure to 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 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 2011.

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

### 2011 Ambient Air Monitoring Network Plan

|  |   |  |
|--|---|--|
| <b>Site Name</b>   | <b>CORONA de TUCSON</b>   |  |
| <b>AQS ID / POC</b>  | 040190008 / 1   |  |
| <b>Address</b>   | 22001 S. Houghton Road, Tucson, AZ                                  |  |
| <b>Latitude/ Longitude</b>   | 32.00474 / -110.79260   |  |
| <b>Elevation</b>   | 3078  |  |
| <b>Method Code</b>   | 126   |  |
| <b>Number of monitors</b>  | 1   |  |
| <b>Parameter code</b>  | 81102   |  |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison  |  |
| <b>Site Type</b>   | Upwind Background   |  |
| <b>Instrument Manufacturer and model</b>                             | R&P 2000  |  |
| <b>FRM/FEM/ARM/other</b>   | FRM   |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ   |  |
| <b>Analytical Lab</b>  | PDEQ  |  |
| <b>Monitor Type</b>  | SLAMS   |  |
| <b>Scale</b>   | Regional  |  |
| <b>Number of daily observations</b>                                  | 58  |  |
| <b>Annual arithmetic mean</b>  | 15.5 µg/m <sup>3</sup>  |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |  |
| <b>Historical exceedances</b>  |   |  |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | 5.0 meters  |  |
| <b>Distance from trees</b>   | 23.4 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1   | 1.6 kilometers west of Houghton Road with a 2010 ADT of 9,000. |
|  | 2   |  |
|  |   |  |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes   |  |

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

### 2011 Ambient Air Monitoring Network Plan

**CORONA de TUCSON: AIRS # 040190008**



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

| Year        | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|-------------|----------------|--------------------|------------------------------------|
| <b>2011</b> | 15.5           | 42                 | 38                                 |

**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

### 2011 Ambient Air Monitoring Network Plan

|   |  |
|---|--|
| <b>Site Name:</b>   | <b>ORANGE GROVE</b>  |
| <b>AQS ID / POC</b>   | 040190011 / 2  |
| <b>Address</b>  | 3401 W. Orange Grove Road, Tucson, AZ  |
| <b>Latitude/ Longitude</b>  | 32.32255 / -111.037700   |
| <b>Elevation</b>  | 2234   |
| <b>Method Code</b>  | 127  |
| <b>Number of monitors</b>   | 2  |
| <b>Parameter code</b>   | 81102  |
| <b>Basic monitoring objective</b>   | NAAQS Comparison   |
| <b>Site Type</b>  | Highest Concentration  |
| <b>Instrument Manufacturer and model</b>  | R&P 2025 Sequential  |
| <b>FRM/FEM/ARM/other</b>  | FRM  |
| <b>Collecting agency / Reporting agency</b>                                     | PDEQ /PDEQ   |
| <b>Analytical Lab</b>   | PDEQ   |
| <b>Monitor Type</b>   | SLAMS  |
| <b>Scale</b>  | Neighborhood   |
| <b>Number of daily observations</b>   | 362  |
| <b>Annual arithmetic mean</b>   | 26.3 µg/m <sup>3</sup>   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>                    | 0  |
| <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>Current Sampling frequency/ season</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>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>Distance from supporting structure</b>                                       | n/a  |
| <b>Distance from obstruction on roof</b>  | n/a  |
| <b>Distance from obstruction not on roof</b>                                    | 21.9 meters  |
| <b>Distance from trees</b>  | 19.2 meters  |
| <b>Distance to furnace or incinerator flue</b>                                  | n/a  |
| <b>Distance between collocated monitors/ Frequency /collocated monitor type</b> | 1.2 meters /Every day ; reported every 6 <sup>th</sup> day/ R& P 2025 Sequential   |

|  |     |  |
|--|-----|--|
| Nearest roads distance & direction to monitor /ADT | 1   | 37 meters west of Camino de la Tierra and 70 meters south of Orange Grove Road with a 2010 ADT of 37,000 |
|  | 2   | 2 kilometers east of Interstate 10 with a 2008 ADT of 104,000  |
| Site meets 40 CFR 58, Appx. A,C,D,E                | Yes |  |



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

| Year        | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|-------------|----------------|--------------------|------------------------------------|
| <b>2011</b> | 26.3           | 100                | 89                                 |

**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

### 2011 Ambient Air Monitoring Network Plan

|  |   |  |
|--|---|--|
| <b>Site Name:</b>  | <b>SOUTH TUCSON</b>   |  |
| <b>AQS ID / POC</b>  | 040191001 / 1   |  |
| <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 Code</b>   | 127   |  |
| <b>Number of monitors</b>  | 2   |  |
| <b>Parameter code</b>  | 81102   |  |
| <b>Basic monitoring objective</b>                                    | NAAQS comparison  |  |
| <b>Site Type</b>   | Population Exposure   |  |
| <b>Instrument Manufacturer and model</b>                             | R&P 2025 Sequential   |  |
| <b>FRM/FEM/ARM/other</b>   | FRM   |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ/ PDEQ  |  |
| <b>Analytical Lab</b>  | PDEQ  |  |
| <b>Monitor Type</b>  | SLAMS   |  |
| <b>Scale</b>   | Neighborhood  |  |
| <b>Number of daily observations</b>                                  | 363   |  |
| <b>Annual arithmetic mean</b>  | 29.9 µg/m <sup>3</sup>  |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |  |
| <b>Historical exceedances</b>  | Exceedances of the 24 – hour standard: two in 1999; two in 2002; one in 2009  |  |
| <b>Current Sampling frequency/ season</b>                            | The exceedances of the NAAQS in 1999 commenced everyday sampling on June 23, 1999.  |  |
| <b>Probe height</b>  | 6.9 meters above the ground on the roof of the South Tucson Governmental Complex Building.                                  |  |
| <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>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | n/a   |  |
| <b>Distance from trees</b>   | 6.7 meters  |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | Every day; reported every 6 <sup>th</sup> day/ R&P 2025 Sequential  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1.7 meters  |  |
|  | 1   | 41 meters east of South 6 <sup>th</sup> Avenue with a 2010 ADT of 15,000 |
|  | 2   | south of 22 <sup>nd</sup> Street with a 2010 ADT of 32,000               |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes   |  |

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

### 2011 Ambient Air Monitoring Network Plan

**SOUTH TUCSON:** AIRS # 040191001



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

| Year | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|------|----------------|--------------------|------------------------------------|
| 2011 | 29.9           | 119                | 87                                 |

**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

### 2011 Ambient Air Monitoring Network Plan

|  |   |  |
|--|---|--|
| <b>Site Name</b>   | <b>PRINCE ROAD</b>  |  |
| <b>AQS ID / POC</b>  | 040191009 / 1   |  |
| <b>Address</b>   | 1016 W. Prince Road, Tucson, AZ   |  |
| <b>Latitude/ Longitude</b>   | 32.272300 / -110.989100   |  |
| <b>Elevation</b>   | 2315  |  |
| <b>Method Code</b>   | 126   |  |
| <b>Number of monitors</b>  | 1   |  |
| <b>Parameter code</b>  | 81102   |  |
| <b>Basic monitoring objective</b>                                    | NAAQS comparison  |  |
| <b>Site Type</b>   | Source Impact   |  |
| <b>Instrument Manufacturer and model</b>                             | R&P 2000  |  |
| <b>FRM/FEM/ARM/other</b>   | FRM   |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ   |  |
| <b>Analytical Lab</b>  | PDEQ  |  |
| <b>Monitor Type</b>  | SLAMS   |  |
| <b>Scale</b>   | Microscale  |  |
| <b>Number of daily observations</b>                                  | 60  |  |
| <b>Annual arithmetic mean</b>  | 31.0 µg/m <sup>3</sup>  |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |  |
| <b>Historical exceedances</b>  |   |  |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | n/a   |  |
| <b>Distance from trees</b>   | 19.8 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>  | 14.1 meters north of Prince Road with a 2010 ADT of 23,000 |
|  | <b>2</b>  |  |
|  |   |  |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes   |  |

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

### 2011 Ambient Air Monitoring Network Plan

#### PRINCE ROAD: AIRS # 040191009

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

| Year | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|------|----------------|--------------------|------------------------------------|
| 2011 | 31.0           | 55                 | 55                                 |



**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 microscale site is representative 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

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>SANTA CLARA SCHOOL</b>  |   |
| <b>AQS ID / POC</b>  | 040191026 / 1  |   |
| <b>Address</b>   | 6910 S. Santa Clara Avenue, Tucson, AZ   |   |
| <b>Latitude/ Longitude</b>   | 32.125950 / -110.982600  |   |
| <b>Elevation</b>   | 2540   |   |
| <b>Method Code</b>   | 126  |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Parameter code</b>  | 81102  |   |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison   |   |
| <b>Site Type</b>   | Population Exposure  |   |
| <b>Instrument Manufacturer and model</b>                             | R&P 2000   |   |
| <b>FRM/FEM/ARM/other</b>   | FRM  |   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ/ PDEQ   |   |
| <b>Analytical Lab</b>  | PDEQ   |   |
| <b>Monitor Type</b>  | Special Purpose  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of daily observations</b>                                  | 60   |   |
| <b>Annual arithmetic mean</b>  | 26.3 µg/m <sup>3</sup>   |   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |   |
| <b>Historical exceedances</b>  | Exceedances of the 24 – hour standard: One on 10/27/2008                       |   |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | 25.6 meters  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 23.9 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 450 meters east of Interstate 19 with a 2008 ADT of 35,000  |
|  | <b>2</b>   | 800 meters south of Valencia Road with a 2010 ADT of 53,000 |
|  |  |   |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |   |

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

### 2011 Ambient Air Monitoring Network Plan

**SANTA CLARA SCHOOL: AIRS # 040191026**

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

| Year        | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|-------------|----------------|--------------------|------------------------------------|
| <b>2011</b> | <b>26.3</b>    | <b>73</b>          | <b>68</b>                          |



**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

### 2011 Ambient Air Monitoring Network Plan

|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>TANGERINE</b>   |  |
| <b>AQS ID / POC</b>  | 040191018 /1   |  |
| <b>Address</b>   | 12101 N. Camino de Oeste, Tucson, AZ   |  |
| <b>Latitude/ Longitude</b>   | 32.425250 / -111.063500  |  |
| <b>Elevation</b>   | 2638   |  |
| <b>Method Code</b>   | 126  |  |
| <b>Number of monitors</b>  | 1  |  |
| <b>Parameter code</b>  | 81102  |  |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison   |  |
| <b>Site Type</b>   | General Background   |  |
| <b>Instrument Manufacturer and model</b>                             | R&P 2000   |  |
| <b>FRM/FEM/ARM/other</b>   | FRM  |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ/ PDEQ   |  |
| <b>Analytical Lab</b>  | PDEQ   |  |
| <b>Monitor Type</b>  | Special Purpose  |  |
| <b>Scale</b>   | Urban  |  |
| <b>Number of daily observations</b>                                  | 58   |  |
| <b>Annual arithmetic mean</b>  | 18.0 µg/m <sup>3</sup>   |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |  |
| <b>Historical exceedances</b>  |  |  |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | n/a  |  |
| <b>Distance from trees</b>   | 6.4 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | Tangerine Road runs approximately east – west 70 meters south of the site with a 2010 ADT of 9,000 |
|  | 2  |  |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |  |

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

### 2011 Ambient Air Monitoring Network Plan

**TANGERINE:** AIRS # 040191018



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

| Year | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|------|----------------|--------------------|------------------------------------|
| 2011 | 18.0           | 66                 | 65                                 |

**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

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>GERONIMO</b>  |   |
| <b>AQS ID / POC</b>  | 040191113 /1   |   |
| <b>Address</b>   | 2498 N. Geronimo Tucson, AZ  |   |
| <b>Latitude/ Longitude</b>   | 32.251840 / -110.965300  |   |
| <b>Elevation</b>   | 2452   |   |
| <b>Method Code</b>   | 079  |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Parameter code</b>  | 81102  |   |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison   |   |
| <b>Site Type</b>   | Population Exposure  |   |
| <b>Instrument Manufacturer and model</b>                             | R & P TEOM   |   |
| <b>FRM/FEM/ARM/other</b>   | FEM  |   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ  |   |
| <b>Analytical Lab</b>  | n/a  |   |
| <b>Monitor Type</b>  | Special Purpose  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of daily observations</b>                                  | 356  |   |
| <b>Annual arithmetic mean</b>  | 29.1 µg/m <sup>3</sup>   |   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |   |
| <b>Historical exceedances</b>  | One exceedance on 7/22/2009  |   |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 9.3 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | one block south of Grant Road (2010 ADT 40,000)                   |
|  | 2  | three blocks east of Stone Avenue (2010 ADT 21,000)               |
|  | 3  | two blocks west of North 1 <sup>st</sup> Avenue (2009 ADT 35,000) |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           |  |   |

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

### 2011 Ambient Air Monitoring Network Plan

**GERONIMO: AIRS # 040191113**

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

| Year | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|------|----------------|--------------------|------------------------------------|
| 2011 | 29.1           | 116                | 85                                 |



**Comments:** This monitor was initially installed in July 1, 2007 for Air Quality Index reporting using a continuous monitor. This is a Special Purpose site situated in a residential area, monitoring for population exposure.

## PM<sub>10</sub> - 2.5 (PM-Coarse) MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

Pima County is monitoring for PM- Coarse at the Children’s Park NCore station as part of the monitoring requirements for an NCore station. PM-Coarse is the difference between PM<sub>10</sub> and PM<sub>2.5</sub>, also referred to as PM<sub>10-2.5</sub>. Pima County is following the requirements set forth in **40 CFR Part 50, App O**.

The PM<sub>2.5</sub> portion of this method is the monitor described on page 40. The PM<sub>10</sub> monitor is described below.

|  |   |
|--|---|
| <b>Site Name</b>   | <b>CHILDREN’S PARK NCore</b>  |
| <b>AQS ID / POC</b>  | 040191028 /1  |
| <b>Address</b>   | 400 W. River Road, Tucson, AZ   |
| <b>Latitude/ Longitude</b>   | 32.295150 / -110.982300   |
| <b>Elevation</b>   | 2286  |
| <b>Method Code</b>   | 176   |
| <b>Number of monitors</b>  | 2   |
| <b>Parameter code</b>  | 86101   |
| <b>Basic monitoring objective</b>                                    | NCore   |
| <b>Site Type</b>   | Population exposure   |
| <b>Instrument Manufacturer and model</b>                             | R& P Partisol-Plus 2025 Sampler Pair  |
| <b>FRM/FEM/ARM/other</b>   | FRM   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ/ PDEQ  |
| <b>Analytical Lab</b>  | PDEQ  |
| <b>Monitor type</b>  | Proposed NCore  |
| <b>Scale</b>   | Neighborhood  |
| <b>Annual arithmetic mean</b>  | 15.8 µg/m <sup>3</sup>  |
| <b>Current Sampling frequency/ season</b>                            | Every three days  |
| <b>Probe height</b>  | 3.1 meters above the ground on a platform located in a city water well site.  |
| <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>Distance from supporting structure</b>                            | n/a   |
| <b>Distance from obstruction on roof</b>                             | n/a   |
| <b>Distance from obstruction not on roof</b>                         | 13.1 meters   |
| <b>Distance from trees</b>   | 8.0 meters  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | same  |

|   |            |   |
|---|------------|---|
| <b>Nearest roads distance &amp; direction to monitor /ADT</b> | 1.2 meters |   |
|   | <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 2008 ADT of 43,000. |
|   | <b>2</b>   | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
| <b>Suitable for comparison to NAAQS</b>                       | No         |   |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                    | Yes        |   |



**Comments:** The subtraction method for determining the coarse PM fraction was initiated in 2011, using a matched pair of Partisol- Plus samplers.

**Annual summary statistics:**

| Year        | Annual Average | 24-Hour Max. Value | 24-Hour 2 <sup>nd</sup> Max. Value |
|-------------|----------------|--------------------|------------------------------------|
| <b>2011</b> | 15.8           | 73.0               | 35.2                               |

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

### 2011 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.

**2011 PM<sub>2.5</sub> Design Criteria**  
**Table 8**  
**PM<sub>2.5</sub> SLAMS (FRM and FEM)**

| Population Pima County 2010 Census | MSA Tucson Population Category | Design Value Site                          | Annual Design Value Years 2009-2011 | Daily Design Value Years 2009-2011 | PM <sub>2.5</sub> Monitors # Required | PM <sub>2.5</sub> Monitors # Operating |
|------------------------------------|--------------------------------|--|-------------------------------------|------------------------------------|---------------------------------------|--|
| 980,263                            | 500,000 – 1,000,000            | Children’s Park NCore 040191028 method 118 | 5.4 µg/m <sup>3</sup>               | 12 µg/m <sup>3</sup>               | Requires 1 SLAMS Monitor              | 2 SLAMS Monitors                       |
|                                    |                                |  |                                     |                                    | <85% of NAAQS                         |  |

**PM<sub>2.5</sub> Continuous (FEM and non-FEM)**

| Design Value Site  | Annual Design Value Years 2009-2011 | Daily Design Value Years 2009-2011 | PM <sub>2.5</sub> Monitors # Required      | PM <sub>2.5</sub> Monitors # Operating |
|--------------------|-------------------------------------|------------------------------------|--|--|
| Geronimo 040191113 | 8.3 µg/m <sup>3</sup>               | 17 µg/m <sup>3</sup>               | No requirement for SP<br>1- Proposed NCore | 4 SP Monitors<br><br>1- Proposed NCore |

**Table 9**

| Collocated PM <sub>2.5</sub> Monitors |                                 |                    |                       |
|---------------------------------------|---------------------------------|--------------------|-----------------------|
| Method                                | # Required Collocation Monitors | # Primary Monitors | # Collocated Monitors |
| 88101 Method 118                      | 1                               | 2                  | 1                     |
| 88101 POC 3 Method 170                | 1                               | 1                  | 0 <sup>A</sup>        |

<sup>A</sup> See comment on next page.

<sup>A</sup> BAM 1020 FEM at Children's Park NCore site is collocated with a PM<sub>2.5</sub> FRM also at that site, that does not meet inlet separation requirements at this time, and is not being reported, pending clarification.

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 NCore 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 very sharp-cut cyclone. 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. We are currently reviewing our parameter codes for the BAM 1020's as we transition from non-FEM BAM's to newer FEM BAM's.

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 2011 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 2011.

#### 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 2011, and include both internal and EPA PEP audits, and the co-located sampler at the Children's Park NCore 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 10**

| <b>Protocol</b>        | <b>Instrument</b>   | <b>Frequency</b> | <b>Date Completed 2010</b>   |
|------------------------|---|------------------|--|
| Flow rate verification | Met One BAM 1020  | Weekly           |  |
| Flow Rate Audit        | Met One BAM 1020  | Quarterly        | Green Valley 03/09, 06/27, 09/28, 12/20<br>Geronimo 03/10, 06/29, 09/28, 12/29<br>Rose Elementary 03/09, 06/30, 09/22, 12/15<br>Coachline 03/08, 06/09, 09/20, 12/15<br>Children's Park 06/09, 09/20, 12/29  |
| Flow rate verification | R& P Partisol-Plus 2025<br>Sequential<br>R & P 2000   | Monthly          |  |
| Flow Rate Audit        | R& P Partisol-Plus 2025<br>Sequential<br>R& P 2000 (Co- located)<br>Met One SASS<br>(Speciation)<br>URG – 3000N<br>(Speciation) | Quarterly        | Orange Grove 03/08, 06/09, 09/22, 12/15<br>Children's Park 03/08, 06/09, 09/25, 12/22<br>Children's Park (Co-located) 03/08, 06/09, 09/21, 12/22<br>Children's Park (Speciation, SASS) 03/23, 06/09, 09/20, 12/22<br>Children's Park (Speciation,URG) 03/23, 06/09, 09/20, 12/22 |
| NPAP Audit             |   |                  | None   |

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

### 2011 Ambient Air Monitoring Network Plan

|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>ORANGE GROVE</b>  |  |
| <b>AQS ID / POC</b>  | 040190011 / POC1   |  |
| <b>Address</b>   | 4301 West Orange Grove Road, Tucson, AZ  |  |
| <b>Latitude/ Longitude</b>   | 32.322550 / -111.037700  |  |
| <b>Elevation</b>   | 2234   |  |
| <b>Method Code</b>   | 118  |  |
| <b>Number of monitors</b>  | 1  |  |
| <b>Parameter code</b>  | 88101  |  |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison   |  |
| <b>Site Type</b>   | Population Exposure  |  |
| <b>Instrument Manufacturer and model</b>                             | R&P Partisol-Plus 2025   |  |
| <b>FRM/FEM/ARM/other</b>   | FRM  |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ  |  |
| <b>Analytical Lab</b>  | PDEQ   |  |
| <b>Monitor Type</b>  | SLAMS  |  |
| <b>Scale</b>   | Neighborhood   |  |
| <b>Number of daily observations</b>                                  | 118  |  |
| <b>Annual arithmetic mean</b>  | 5.69 µg/m <sup>3</sup>   |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |  |
| <b>Historical exceedances</b>  |  |  |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | 18.6 meters  |  |
| <b>Distance from trees</b>   | 20.3 meters  |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <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 2010 ADT of 37,000 |
|  | <b>2</b>   | 2 kilometers east of Interstate 10 with a 2008 ADT of 104,000  |
|  |  |  |
| <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

### 2011 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  $\mu\text{g}/\text{m}^3$  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 |
|------|---------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------|----------------|
| 2011 | 13.8                | 12.4                          | 12.0                          | 11.5                          | 12.0                     | 5.69           |

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

### 2011 Ambient Air Monitoring Network Plan

|  |   |
|--|---|
| <b>Site Name</b>   | CHILDREN'S PARK NCore   |
| <b>AQS ID / POC</b>  | 040191028/ POC2   |
| <b>Address</b>   | 400 W. River Road, Tucson, AZ   |
| <b>Latitude/ Longitude</b>   | 32.295150 / -110.982300   |
| <b>Elevation</b>   | 2286  |
| <b>Method Code</b>   | 118   |
| <b>Number of monitors</b>  | 2   |
| <b>Parameter code</b>  | 88101   |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison  |
| <b>Site Type</b>   | Population Exposure   |
| <b>Instrument Manufacturer and model</b>                             | R& P Partisol-Plus 2025   |
| <b>FRM/FEM/ARM/other</b>   | FRM   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ   |
| <b>Analytical Lab</b>  | PDEQ  |
| <b>Monitor Type</b>  | SLAMS NCore   |
| <b>Scale</b>   | Neighborhood  |
| <b>Number of daily observations</b>                                  | 116   |
| <b>Annual arithmetic mean</b>  | 5.41 µg/m <sup>3</sup>  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |
| <b>Historical exceedances</b>  |   |
| <b>Current Sampling frequency/ season</b>                            | Every three days  |
| <b>Probe height</b>  | 3.1 meters above the ground on a platform located in a city water well site.  |
| <b>Surrounding landscape</b>   | Gravel in walled compound, dirt parking lot, dry river bed  |
| <b>Degrees of unrestricted air flow</b>                              | 360   |
| <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>Distance from supporting structure</b>                            | n/a   |
| <b>Distance from obstruction on roof</b>                             | n/a   |
| <b>Distance from obstruction not on roof</b>                         | 13.1 meters   |
| <b>Distance from trees</b>   | 8.0 meters  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | Every twelve days / R&P 2000  |
|  |   |

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

### 2011 Ambient Air Monitoring Network Plan

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

|  |   |
|--|---|
| Nearest roads distance & direction to monitor /ADT | 1.2 meters  |
|  | 1 Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2 River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
| Suitable for comparison to NAAQS                   | Yes   |
| Site meets 40 CFR 58, Appx. A,C,D,E                | Yes   |



**Comments:** Continuous 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 |
|------|---------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------|----------------|
| 2011 | 12.2                | 11.5                          | 11.3                          | 11.1                          | 11.3                     | 5.41           |

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

### 2011 Ambient Air Monitoring Network Plan

|  |   |  |
|--|---|--|
| <b>Site Name</b>   | CHILDREN'S PARK NCore   |  |
| <b>AQS ID / POC</b>  | 040191028 / POC 3   |  |
| <b>Address</b>   | 400 W. River Road, Tucson, AZ   |  |
| <b>Latitude/ Longitude</b>   | 32.295150 / -110.982300   |  |
| <b>Elevation</b>   | 2286  |  |
| <b>Method Code</b>   | 170   |  |
| <b>Number of monitors</b>  | 1   |  |
| <b>Parameter code</b>  | 88101   |  |
| <b>Basic monitoring objective</b>                                    | NAAQS Comparison  |  |
| <b>Site Type</b>   | Population Exposure   |  |
| <b>Instrument Manufacturer and model</b>                             | Met One Beta Attenuation 1020   |  |
| <b>FRM/FEM/ARM/other</b>   | FEM   |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ/ PDEQ  |  |
| <b>Analytical Lab</b>  | n/a   |  |
| <b>Monitor Type</b>  | Proposed NCore  |  |
| <b>Scale</b>   | Neighborhood  |  |
| <b>Number of daily observations</b>                                  | 343   |  |
| <b>Annual arithmetic mean</b>  | 5.77 µg/m <sup>3</sup>  |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |  |
| <b>Historical exceedances</b>  |   |  |
| <b>Current Sampling frequency/ season</b>                            | Continuous  |  |
| <b>Probe height</b>  | 3.1 meters above the ground on a platform located in a city water well site.  |  |
| <b>Surrounding landscape</b>   | Gravel in walled compound, dirt parking lot, dry river bed  |  |
| <b>Degrees of unrestricted air flow</b>                              | 360   |  |
| <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>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | 13.1 meters   |  |
| <b>Distance from trees</b>   | 8.0 meters  |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | Every twelve days / R&P 2000  |  |
|  |   |  |

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

### 2011 Ambient Air Monitoring Network Plan

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

|  |   |   |
|--|---|---|
| Nearest roads distance & direction to monitor /ADT |   | 1.2 meters  |
|  | 1 | Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2 | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
| Suitable for comparison to NAAQS:                  |   | Yes   |
| Site meets 40 CFR 58, Appx. A,C,D,E                |   | Yes   |



**Comments:** PM<sub>2.5</sub> sampling began at this neighborhood scale site in January 23, 2011

**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 |
|------|---------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------|----------------|
| 2011 | 18.7                | 17.0                          | 16.5                          | 16.1                          | 14.1                     | 5.77           |

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

### 2011 Ambient Air Monitoring Network Plan

|  |   |  |
|--|---|--|
| <b>Site Name</b>   | <b>ROSE ELEMENTARY</b>  |  |
| <b>AQS ID / POC</b>  | 040191032 / POC 3   |  |
| <b>Address</b>   | 710 W. Michigan, Tucson, AZ   |  |
| <b>Latitude/ Longitude</b>   | 32.172950 / -110.980050   |  |
| <b>Elevation</b>   | 2387  |  |
| <b>Method Code</b>   | 733   |  |
| <b>Number of monitors</b>  | 1   |  |
| <b>Parameter code</b>  | 88501   |  |
| <b>Basic monitoring objective</b>                                    | Public Information  |  |
| <b>Site Type</b>   | Population Exposure   |  |
| <b>Instrument Manufacturer and model</b>                             | Met-One Beta Attenuation 1020   |  |
| <b>FRM/FEM/ARM/other</b>   | Other   |  |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ   |  |
| <b>Analytical Lab</b>  | n/a   |  |
| <b>Monitor Type</b>  | Special Purpose   |  |
| <b>Scale</b>   | Neighborhood  |  |
| <b>Number of daily observations</b>                                  | 360   |  |
| <b>Annual arithmetic mean</b>  | 8.68 µg/m <sup>3</sup>  |  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |  |
| <b>Historical exceedances</b>  | 0   |  |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | n/a   |  |
| <b>Distance from trees</b>   | 11.8 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>  | 12 <sup>th</sup> Avenue to the east with a 2009 ADT of 22,000                      |
|  | <b>2</b>  | Ajo Way to the north with a 2010 ADT of 28,000                                     |
|  | <b>3</b>  | Interstate 19 runs north-south half a kilometer to the west with a 2008 ADT 76,000 |
| <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

### 2011 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 |
|------|---------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------|----------------|
| 2011 | 33.3                | 25.6                          | 23.0                          | 21.2                          | 18.0                     | 8.68           |

**PM<sub>2.5</sub> MONITORING NETWORK**  
**2011 Ambient Air Monitoring Network Plan**

|  |   |   |
|--|---|---|
| <b>Site Name</b>   | <b>COACHLINE</b>  |   |
| <b>AQS ID / POC</b>  | 040191034 / POC3  |   |
| <b>Address</b>   | 9597 N. Coachline, Tucson, AZ   |   |
| <b>Latitude/ Longitude</b>   | 32.380820 / -111.127160   |   |
| <b>Elevation</b>   | 2228  |   |
| <b>Method Code</b>   | 733   |   |
| <b>Number of monitors</b>  | 1   |   |
| <b>Parameter code</b>  | 88501   |   |
| <b>Basic monitoring objective</b>                                    | Public Information  |   |
| <b>Site Type</b>   | Population Exposure   |   |
| <b>Instrument Manufacturer and model</b>                             | Met-One Beta Attenuation 1020   |   |
| <b>FRM/FEM/ARM/other</b>   | Other   |   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ   |   |
| <b>Analytical Lab</b>  | n/a   |   |
| <b>Monitor Type</b>  | Special Purpose   |   |
| <b>Scale</b>   | Neighborhood  |   |
| <b>Number of daily observations</b>                                  | 354   |   |
| <b>Annual arithmetic mean</b>  | 8.06 µg/m <sup>3</sup>  |   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0   |   |
| <b>Historical exceedances</b>  | 0   |   |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a   |   |
| <b>Distance from obstruction on roof</b>                             | n/a   |   |
| <b>Distance from obstruction not on roof</b>                         | 9.41 meters   |   |
| <b>Distance from trees</b>   | 3.0 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1   | approximately 1.25 kilometers west of Interstate 10 with a 2008 ADT of 72,000 |
|  | 2   | .5 kilometer north of Silverbell Road 2010 ADT of 26,000                      |
| <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

### 2011 Ambient Air Monitoring Network Plan

**COACHLINE: AIRS # 040191034**



**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>2011</b> | <b>33.7</b>         | <b>25.9</b>                   | <b>19.2</b>                   | <b>17.1</b>                   | <b>15.0</b>              | <b>8.06</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**

**2011 Ambient Air Monitoring Network Plan**

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>GREEN VALLEY</b>  |   |
| <b>AQS ID / POC</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 Code</b>   | 733  |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Parameter code</b>  | 88501  |   |
| <b>Basic monitoring objective</b>                                    | Public Information   |   |
| <b>Site Type</b>   | Population Exposure  |   |
| <b>Instrument Manufacturer and model</b>                             | Met-One Beta Attenuation 1020  |   |
| <b>FRM/FEM/ARM/other</b>   | Other  |   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ / PDEQ  |   |
| <b>Analytical Lab</b>  | n/a  |   |
| <b>Monitor Type</b>  | Special Purpose  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of daily observations</b>                                  | 350  |   |
| <b>Annual arithmetic mean</b>  | 4.90 µg/m <sup>3</sup>   |   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |   |
| <b>Historical exceedances</b>  | 0  |   |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 7.5 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 100 meters west of La Canada (2010 ADT of 11,000)         |
|  | <b>2</b>   | 0.5 kilometers west of Interstate 19 (2008 ADT of 31,000) |
|  |  |   |
| <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

### 2011 Ambient Air Monitoring Network Plan

#### GREEN VALLEY: AIRS # 040191030



**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>2011</b> | <b>18.8</b>         | <b>16.2</b>                   | <b>15.4</b>                   | <b>14.8</b>                   | <b>14.0</b>              | <b>4.90</b>    |

**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

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>GERONIMO</b>  |   |
| <b>AQS ID / POC</b>  | 040191113 / POC3   |   |
| <b>Address</b>   | 2498 N. Geronimo, Tucson, AZ   |   |
| <b>Latitude/ Longitude</b>   | 32.251840 / -110.965300  |   |
| <b>Elevation</b>   | 2452   |   |
| <b>Method Code</b>   | 733  |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Parameter code</b>  | 88501  |   |
| <b>Basic monitoring objective</b>                                    | Public Information   |   |
| <b>Site Type</b>   | Population Exposure  |   |
| <b>Instrument Manufacturer and model</b>                             | Met-One Beta Attenuation 1020  |   |
| <b>FRM/FEM/ARM/other</b>   | Other  |   |
| <b>Collecting agency / Reporting agency</b>                          | PDEQ/ PDEQ   |   |
| <b>Analytical Lab</b>  | n/a  |   |
| <b>Monitor Type</b>  | Special Purpose  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of daily observations</b>                                  | 357  |   |
| <b>Annual arithmetic mean</b>  | 9.48 µg/m <sup>3</sup>   |   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |   |
| <b>Historical exceedances</b>  |  |   |
| <b>Current Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 9.4 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | one block south of Grant Road (2010 ADT 40,000)                   |
|  | <b>2</b>   | three blocks east of Stone Avenue (2010ADT 21,000)                |
|  | <b>3</b>   | two blocks west of North 1 <sup>st</sup> Avenue (2009 ADT 35,000) |
| <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

### 2011 Ambient Air Monitoring Network Plan

**GERONIMO: AIRS # 040191113**

**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>2011</b> | <b>24.7</b>         | <b>22.5</b>                   | <b>20.4</b>                   | <b>20.1</b>                   | <b>18.0</b>              | <b>9.48</b>    |



**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. This is a Special Purpose site situated in a residential area, monitoring for population exposure.

**PM<sub>2.5</sub> SPECIATION**  
**2011 Ambient Air Monitoring Network Plan**

|  |   |   |
|--|---|---|
| <b>Site Name</b>   |   | CHILDREN'S PARK NCore (Speciation)  |
| <b>AQS ID</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>Parameter code</b>  |   | 88502   |
| <b>Basic monitoring objective</b>                                    |   | Research  |
| <b>Site Type</b>   |   | Population Exposure   |
| <b>Instrument Manufacturer and model</b>                             |   | Met One SASS with URG 3000N   |
| <b>FRM/FEM/ARM/other</b>   |   | Other   |
| <b>Monitor Type</b>  |   | NCore PM <sub>2.5</sub> Speciation  |
| <b>Scale</b>   |   |   |
| <b>Analyzing &amp; Reporting Org</b>                                 |   | RTP   |
| <b>Collecting Org</b>  |   | Pima County Department of Environmental Quality   |
| <b>Number of daily observations</b>                                  |   | 92  |
| <b>Annual arithmetic mean</b>  |   | 6.96 µg/m <sup>3</sup>  |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         |   | 0   |
| <b>Historical exceedances</b>  |   |   |
| <b>Sampling frequency/ season</b>                                    |   | Every 3 <sup>rd</sup> day   |
| <b>Probe height</b>  |   | 3 meters above the ground on a platform located in a city water well site.  |
| <b>Surrounding landscape</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>Degrees of unrestricted air flow</b>                              |   | 270   |
| <b>Location description</b>  |   | Gravel in walled compound, dirt parking lot, dry river bed  |
| <b>Distance from supporting structure</b>                            |   | n/aRe   |
| <b>Distance from obstruction on roof</b>                             |   | n/a   |
| <b>Distance from obstruction not on roof</b>                         |   | SASS 15.8 meters  |
| <b>Distance from trees</b>   |   | SASS 5.2 meters   |
| <b>Distance to furnace or incinerator flue</b>                       |   | n/a   |
| <b>Distance between collocated monitors/ collocated monitor type</b> |   | n/a   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1   | Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2   | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
| <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> SPECIATION**  
**2011 Ambient Air Monitoring Network Plan**

**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 | Annual Average |
|-------------|---------------------|-------------------------------|-------------------------------|-------------------------------|----------------|
| <b>2011</b> | <b>24.0</b>         | <b>16.3</b>                   | <b>15.5</b>                   | <b>14.1</b>                   | <b>6.96</b>    |

## CARBON MONOXIDE MONITORING NETWORK

### 2011 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 942,202 vehicles registered in Pima County in 2011, an increase of 8,584 more than last year and 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 five 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.

#### 2011 CO Design Criteria

**Table 11**

| Population<br>Pima County<br>2010 Census | MSA<br>Tucson<br>Population Category | 1- Hour<br>Design Value<br>2009-2010 | CO Monitors<br># Required  | CO Monitors<br># Operating |
|--|--------------------------------------|--------------------------------------|----------------------------|----------------------------|
| 980,263                                  | 500,000 – 1,000,000                  | 2.5 ppm                              | No Specific<br>Requirement | 2 SLAMS<br>Monitors        |
|  |                                      |                                      |                            | 3 SP Monitors              |

#### Violation History

No exceedances of the National Ambient Air Quality Standards for CO were recorded in Tucson in 1989 through 2011. 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 was 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 2011. 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. Three levels are reported of the four audit point levels that are used for CO. The audit levels are: level two at .900 -2.99 ppm, level three at 3.0-7.99 ppm, level four at 8.0-15.99 ppm and level five at 16.0-30.99 ppm. All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 12**

| <b>Carbon Monoxide Audit Dates 2011</b>          |
|--|
| Craycroft & 22 <sup>nd</sup> St. 06/20, 12/19    |
| Children's Park 03/24, 09/19                     |
| Cherry & Glenn; Seasonal 03/31, 12/20            |
| Alvernon & 22 <sup>nd</sup> St. 03/22, 09/16     |
| Golf Links & Kolb; Seasonal 03/31, 12/19         |
| <b>NPAP Carbon Monoxide TTP Audit Dates 2011</b> |
| Golf Links & Kolb 10/25/2011                     |
| Cherry & Glenn 10/25/2011                        |

## CARBON MONOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>  |   |
| <b>AQS ID</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>Site type</b>   | Population Exposure  |   |
| <b>Monitor type</b>  | SLAMS  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 8708   |   |
| <b>Number of exceedances in 2011</b>                                 | 0  |   |
| <b>Historical exceedances</b>  |  |   |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 22.0 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 260 meters west is Craycroft Road with 2010 ADT of 30,000             |
|  | <b>2</b>   | 260 meters north is 22 <sup>nd</sup> Street with a 2010 ADT of 46,000 |
|  |  |   |
| <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

### 2011 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                           | 2.1 | 01/01 | 2200 |
| Second Highest                    | 2.0 | 01/14 | 0700 |

| Eight – hour average concentrations | ppm | Date  | Hour |
|-------------------------------------|-----|-------|------|
| Highest                             | 0.9 | 01/06 | 0900 |
| Second Highest                      | 0.9 | 12/24 | 2300 |

## CARBON MONOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |   |  |
|--|---|--|
| <b>Site Name</b>   | <b>22<sup>ND</sup> STREET &amp; ALVERNON</b>  |  |
| <b>AQS ID</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>Site type</b>   | Highest Concentration   |  |
| <b>Monitor type</b>  | SLAMS   |  |
| <b>Scale</b>   | Microscale  |  |
| <b>Number of hourly observations</b>                                 | 8705  |  |
| <b>Number of exceedances in 2011</b>                                 | 0   |  |
| <b>Historical exceedances</b>  | Years: 1975 - 1986 and 1988   |  |
| <b>Sampling frequency/ season</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 near a high traffic count intersection. A large regional park is located to the northwest of the site. |  |
| <b>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | 2.0 meters  |  |
| <b>Distance from trees</b>   | 3.0 meters  |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>  | 60 meters west of Alvernon Way with a 2010 ADT of 33,000             |
|  | <b>2</b>  | 10 meters north of 22 <sup>nd</sup> Street with a 2010 ADT of 38,000 |
|  |   |  |
| <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,

## CARBON MONOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

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

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 2011.



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

| One – hour average concentrations | ppm | Date  | Hour |
|-----------------------------------|-----|-------|------|
| Highest                           | 3.1 | 12/15 | 1500 |
| Second Highest                    | 2.5 | 12/15 | 1100 |

| Eight – hour average concentrations | ppm | Date  | Hour |
|-------------------------------------|-----|-------|------|
| Highest                             | 1.8 | 12/15 | 1600 |
| Second Highest                      | 1.6 | 12/14 | 1600 |

## CARBON MONOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>CHERRY &amp; GLENN</b>  |   |
| <b>AQS ID</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>Site type</b>   | Population Exposure  |   |
| <b>Monitor type</b>  | Special Purpose  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 4348; Seasonal monitor operation from Jan 1- March 31 and Oct. 1 – Dec. 31   |   |
| <b>Number of exceedances in 2011</b>                                 | 0  |   |
| <b>Historical exceedances</b>  |  |   |
| <b>Sampling frequency/ season</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>  | This site is located in a predominately residential neighborhood, approximately 0.8 km northwest of a high traffic count intersection. Directly south and west of the site is a private High School enrolling approximately 1200 students. |   |
| <b>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 8.7 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | 0.8 kilometers north of Grant Road with a 2010 ADT of 43,000      |
|  | 2  | 0.5 kilometers west of Campbell Avenue with a 2009 ADT of 41,000. |
|  |  |   |
| <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 March.

## CARBON MONOXIDE MONITORING NETWORK

### 2011 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                           | 1.8 | 12/24 | 2300 |
| Second Highest                    | 1.7 | 01/02 | 0000 |

| Eight – hour average concentrations | ppm | Date  | Hour |
|-------------------------------------|-----|-------|------|
| Highest                             | 1.3 | 01/03 | 0300 |
| Second Highest                      | 1.2 | 01/01 | 0500 |

## CARBON MONOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

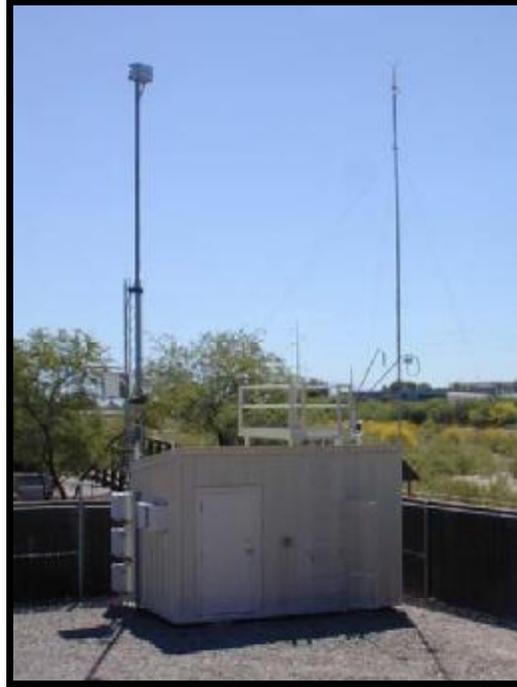
|  |   |   |
|--|---|---|
| <b>Site Name</b>   | <b>CHILDREN'S PARK NCore</b>  |   |
| <b>AQS ID</b>  | 040191028   |   |
| <b>Address</b>   | 400 W. River Road, Tucson, AZ   |   |
| <b>Latitude/ Longitude</b>   | 32.295150 / -110.982300   |   |
| <b>Elevation</b>   | 2286  |   |
| <b>Method</b>  | 054 / 554   |   |
| <b>Number of monitors</b>  | 1   |   |
| <b>Type of monitor</b>   | Instrumental non-dispersive infrared  |   |
| <b>Site type</b>   | Population Exposure   |   |
| <b>Monitor type</b>  | Special Purpose   |   |
| <b>Scale</b>   | Neighborhood  |   |
| <b>Number of hourly observations</b>                                 | 8666  |   |
| <b>Number of exceedances in 2011</b>                                 | 0   |   |
| <b>Historical exceedances</b>  |   |   |
| <b>Sampling frequency/ season</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>                              | 360   |   |
| <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>Distance from supporting structure</b>                            | n/a   |   |
| <b>Distance from obstruction on roof</b>                             | n/a   |   |
| <b>Distance from obstruction not on roof</b>                         | n/a   |   |
| <b>Distance from trees</b>   | 12.8 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |   |
| <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 2008 ADT of 43,000. |
|  | <b>2</b>  | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
|  |   |   |
| <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

### 2011 Ambient Air Monitoring Network Plan

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



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

| One – hour average concentrations | ppm | Date  | Hour |
|-----------------------------------|-----|-------|------|
| Highest                           | 1.1 | 12/07 | 0900 |
| Second Highest                    | 1.1 | 12/07 | 1000 |

| Eight – hour average concentrations | ppm | Date  | Hour |
|-------------------------------------|-----|-------|------|
| Highest                             | 0.7 | 02/04 | 0400 |
| Second Highest                      | 0.6 | 01/02 | 0100 |

## CARBON MONOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>GOLF LINKS &amp; KOLB</b>   |   |
| <b>AQS ID</b>  | 040191031  |   |
| <b>Address</b>   | 2601 South Kolb Road   |   |
| <b>Latitude/ Longitude</b>   | 32.191180 / -110.840550  |   |
| <b>Elevation</b>   | 2661   |   |
| <b>Method</b>  | 093/ 054   |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Type of monitor</b>   | Instrumental non-dispersive infrared   |   |
| <b>Site type</b>   | Highest Concentration  |   |
| <b>Monitor type</b>  | Special Purpose  |   |
| <b>Scale</b>   | Microscale   |   |
| <b>Number of hourly observations</b>                                 | 4333 ; Seasonal Monitor operating Jan. 1- March 31 and Oct. 1 – Dec. 31  |   |
| <b>Number of exceedances in 2011</b>                                 | 0  |   |
| <b>Historical exceedances</b>  |  |   |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | 36.3 meters  |   |
| <b>Distance from trees</b>   | 2.7 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 100 meters south of Golf Links, with a 2010 ADT of 40,000 |
|  | <b>2</b>   | 2 meters east of Kolb Road, with a 2009 ADT of 47,000.    |
|  |  |   |
| <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

### 2011 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 | 01/25 | 1800 |
| Second Highest                    | 1.6 | 01/05 | 1700 |

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

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

Ozone (O<sub>3</sub>) is currently being monitored at seven 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**.

**2011 O<sub>3</sub> Design Criteria  
Table 13**

| <b>Population<br/>Pima<br/>County<br/>2010<br/>Census</b> | <b>MSA<br/>Tucson<br/>Population<br/>Category</b> | <b>Design Value<br/>Site</b> | <b>8- Hour Design<br/>Value<br/>(2009-2011)</b> | <b>O<sub>3</sub> Monitors<br/># Required</b> | <b>O<sub>3</sub> Monitors<br/># Operating</b> |
|---|---|------------------------------|---|--|---|
| 980,263   | 500,000 –<br>1,000,000                            | Saguaro Park<br>040190021    | .070 ppm  | Requires 2<br>SLAMS<br>Monitors              | 3 SLAMS<br>Monitors                           |
|   |   |                              |   | No Requirement<br>for SP                     | 5 SP Monitors                                 |

#### 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. 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 2011. 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, 0.065ppm, and 0.085ppm. Pima County maintains an ozone primary standard which is verified for accuracy by the California Air Resources Board in Sacramento. Pima County passed the two NPAP Ozone TTP Audits for Green Valley and Rose Elementary. All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 14**

| <b>Ozone Audit Dates 2011</b>                 |
|---|
| Craycroft & 22 <sup>nd</sup> St. 06/20, 12/19 |
| Children's Park 03/24, 09/19                  |
| Fairgrounds 06/17, 12/14                      |
| Tangerine 03/08, 09/08                        |
| Saguaro Park 06/17, 12/14                     |
| Coachline 03/08, 09/20                        |
| Rose Elementary 06/30, 12/15                  |
| Green Valley 06/27, 12/20                     |
| <b>NPAP Ozone TTP Audit Dates 2011</b>        |
| Saguaro Park 5/18/2011                        |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

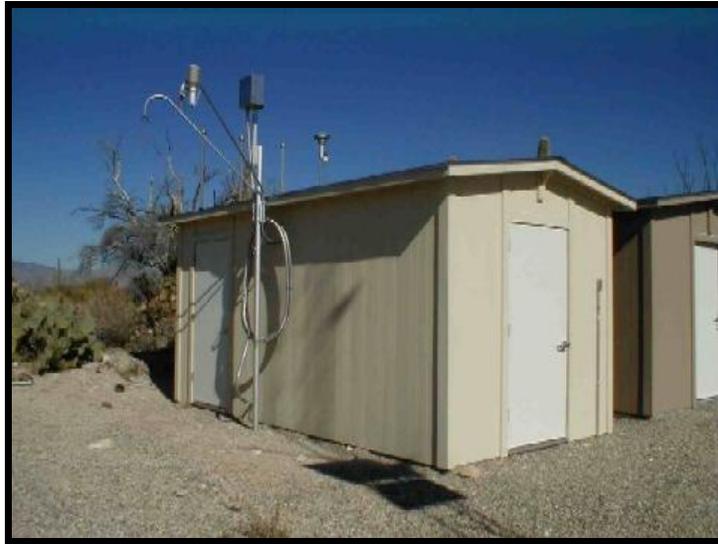
|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>SAGUARO PARK EAST</b>   |  |
| <b>AQS ID</b>  | 040190021  |  |
| <b>Address</b>   | 3905 South Old Spanish Trail, Tucson, AZ   |  |
| <b>Latitude/ Longitude</b>   | 32.174520 / -110.737160  |  |
| <b>Elevation</b>   | 3089   |  |
| <b>Method</b>  | 047  |  |
| <b>Number of monitors</b>  | 1  |  |
| <b>Type of monitor</b>   | Instrumental ultra violet radiation absorption   |  |
| <b>Site type</b>   | Highest Concentration  |  |
| <b>Monitor type</b>  | SLAMS  |  |
| <b>Scale</b>   | Neighborhood   |  |
| <b>Number of hourly observations</b>                                 | 8729   |  |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 3  |  |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | 14.9 meters  |  |
| <b>Distance from trees</b>   | 8.0 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 80 meters east to Old Spanish Trail with a 2009 ADT of 7,000 |
|  | <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

### 2011 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                           | .098 | 05/30 | 1600 |
| Second Highest                    | .086 | 07/06 | 1500 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .080 | 05/30 | 1100         |
| Second Highest                      | .078 | 07/06 | 1100         |
| Third Highest                       | .078 | 07/08 | 1100         |
| Fourth Highest                      | .075 | 06/21 | 1000         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>  |   |
| <b>AQS ID</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>Site type</b>   | Population Exposure  |   |
| <b>Monitor type</b>  | SLAMS  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 8749   |   |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 1  |   |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 22.0 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 260 meters west is Craycroft Road with 2010 ADT of 30,000             |
|  | <b>2</b>   | 260 meters north is 22 <sup>nd</sup> Street with a 2010 ADT of 46,000 |
| <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

### 2011 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                           | .090 | 05/30 | 1600 |
| Second Highest                    | .082 | 09/01 | 1500 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .077 | 05/30 | 1200         |
| Second Highest                      | .072 | 09/01 | 1000         |
| Third Highest                       | .071 | 07/08 | 1100         |
| Fourth Highest                      | .070 | 05/25 | 0900         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>TANGERINE</b>   |  |
| <b>AQS ID</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>Site type</b>   | Highest Concentration  |  |
| <b>Monitor type</b>  | Special Purpose  |  |
| <b>Scale</b>   | Urban  |  |
| <b>Number of hourly observations</b>                                 | 8698   |  |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 0  |  |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | n/a  |  |
| <b>Distance from trees</b>   | 8.3 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | Tangerine Road runs approximately east – west 70 meters south of the site with a 2010 ADT of 9,000 |
|  | 2  |  |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |  |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

**TANGERINE:** AIRS # 040191018



**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.

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

| One – hour average concentrations | ppm  | Date  | Hour |
|-----------------------------------|------|-------|------|
| Highest                           | .076 | 6/10  | 1500 |
| Second Highest                    | .075 | 07/08 | 1400 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .070 | 06/10 | 1100         |
| Second Highest                      | .070 | 07/06 | 1200         |
| Third Highest                       | .070 | 0708  | 1100         |
| Fourth Highest                      | .069 | 05/25 | 1000         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

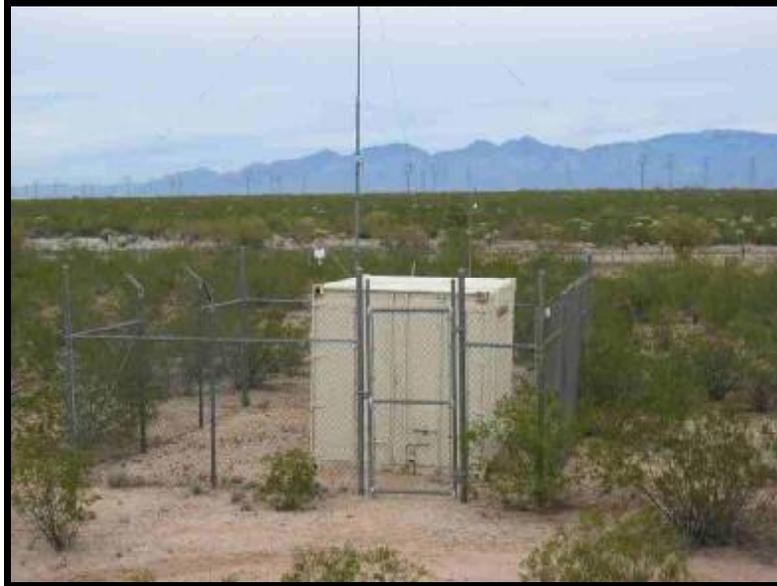
|  |   |  |
|--|---|--|
| <b>Site Name</b>   | <b>FAIRGROUNDS</b>  |  |
| <b>AQS ID</b>  | 040191020   |  |
| <b>Address</b>   | 11330 S. Houghton Road, Tucson, AZ  |  |
| <b>Latitude/ Longitude</b>   | 32.047650 / -110.774350   |  |
| <b>Elevation</b>   | 3078  |  |
| <b>Method</b>  | 047   |  |
| <b>Number of monitors</b>  | 1   |  |
| <b>Type of monitor</b>   | Instrumental ultra violet radiation absorption  |  |
| <b>Site type</b>   | General /Background   |  |
| <b>Monitor type</b>  | Special Purpose   |  |
| <b>Scale</b>   | Urban   |  |
| <b>Number of hourly observations</b>                                 | 8512  |  |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 1   |  |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a   |  |
| <b>Distance from obstruction on roof</b>                             | n/a   |  |
| <b>Distance from obstruction not on roof</b>                         | n/a   |  |
| <b>Distance from trees</b>   | n/a   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>  | 53 meters west of Houghton road with a 2010 ADT of 9,000 |
|  | <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

### 2011 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                           | .085 | 05/30 | 1600 |
| Second Highest                    | .084 | 08/24 | 1500 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .077 | 05/30 | 1200         |
| Second Highest                      | .074 | 06/21 | 1100         |
| Third Highest                       | .073 | 06/10 | 1100         |
| Fourth Highest                      | .073 | 07/06 | 1100         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |   |   |
|--|---|---|
| <b>Site Name</b>   | <b>CHILDREN'S PARK NCore</b>  |   |
| <b>AQS ID</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>Site type</b>   | Population Exposure   |   |
| <b>Monitor type</b>  | NCore   |   |
| <b>Scale</b>   | Neighborhood  |   |
| <b>Number of hourly observations</b>                                 | 8725  |   |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 0   |   |
| <b>Sampling frequency/ season</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>                              | 360   |   |
| <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>Distance from supporting structure</b>                            | n/a   |   |
| <b>Distance from obstruction on roof</b>                             | n/a   |   |
| <b>Distance from obstruction not on roof</b>                         | n/a   |   |
| <b>Distance from trees</b>   | 16.4 meters   |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1   | Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2   | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes   |   |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

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



**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.

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

| One – hour average concentrations | ppm  | Date  | Hour |
|-----------------------------------|------|-------|------|
| Highest                           | .082 | 05/30 | 1400 |
| Second Highest                    | .076 | 06/10 | 1400 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .073 | 05/30 | 1100         |
| Second Highest                      | .069 | 06/21 | 1100         |
| Third Highest                       | .069 | 07/08 | 1100         |
| Fourth Highest                      | .068 | 05/25 | 1000         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>ROSE ELEMENTARY</b>   |  |
| <b>AQS ID</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>Site type</b>   | Population Exposure  |  |
| <b>Monitor type</b>  | Special Purpose  |  |
| <b>Scale</b>   | Neighborhood   |  |
| <b>Number of hourly observations</b>                                 | 8645   |  |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 0  |  |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | n/a  |  |
| <b>Distance from trees</b>   | 9.4 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 12 <sup>th</sup> Avenue to the east with a 2009 ADT of 22,000                      |
|  | <b>2</b>   | Ajo Way to the north with a 2010 ADT of 28,000                                     |
|  | <b>3</b>   | Interstate 19 runs north-south half a kilometer to the west with a 2008 ADT 76,000 |
| <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

### 2011 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                           | .078 | 05/30 | 1500 |
| Second Highest                    | .075 | 05/04 | 1400 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .073 | 05/30 | 1200         |
| Second Highest                      | .068 | 07/06 | 1100         |
| Third Highest                       | .066 | 05/05 | 1000         |
| Fourth Highest                      | .066 | 05/25 | 1000         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |   |   |
|--|---|---|
| <b>Site Name</b>   | <b>COACHLINE</b>  |   |
| <b>AQS ID</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>Site type</b>   | Population Exposure   |   |
| <b>Monitor type</b>  | Special Purpose   |   |
| <b>Scale</b>   | Neighborhood  |   |
| <b>Number of hourly observations</b>                                 | 8699  |   |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 0   |   |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a   |   |
| <b>Distance from obstruction on roof</b>                             | n/a   |   |
| <b>Distance from obstruction not on roof</b>                         | 10.73 meters  |   |
| <b>Distance from trees</b>   | 4.5 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a   |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a   |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1   | approximately 1.25 kilometers west of Interstate 10 with a 2008 ADT of 72,000 |
|  | 2   | .5 kilometer north of Silverbell Road 2010 ADT of 26,000                      |
|  |   |   |
| <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

### 2011 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                           | .072 | 05/25 | 1300 |
| Second Highest                    | .072 | 05/30 | 1300 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .069 | 05/30 | 1100         |
| Second Highest                      | .067 | 05/25 | 1000         |
| Third Highest                       | .066 | 06/10 | 1100         |
| Fourth Highest                      | .065 | 04/12 | 1100         |

## OZONE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |  |
|--|--|--|
| <b>Site Name</b>   | <b>GREEN VALLEY</b>  |  |
| <b>AQS ID</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>Site type</b>   | Population Exposure  |  |
| <b>Monitor type</b>  | Special Purpose  |  |
| <b>Scale</b>   | Neighborhood   |  |
| <b>Number of hourly observations</b>                                 | 8690   |  |
| <b>Number of 8- hour average exceedances in 2011</b>                 | 0  |  |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |  |
| <b>Distance from obstruction on roof</b>                             | n/a  |  |
| <b>Distance from obstruction not on roof</b>                         | n/a  |  |
| <b>Distance from trees</b>   | 8.0 meters   |  |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |  |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |  |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 100 meters west of La Canada /2010 ADT of 11,000         |
|  | <b>2</b>   | 0.5 kilometers west of Interstate 19 /2008 ADT of 31,000 |
|  |  |  |
| <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

### 2011 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                           | .079 | 06/10 | 1800 |
| Second Highest                    | .076 | 05/25 | 1500 |

| Eight – hour average concentrations | ppm  | Date  | Hour (begin) |
|-------------------------------------|------|-------|--------------|
| Highest                             | .073 | 06/10 | 1100         |
| Second Highest                      | .072 | 07/06 | 1200         |
| Third Highest                       | .071 | 05/24 | 1000         |
| Fourth Highest                      | .071 | 05/25 | 0800         |

## NITROGEN DIOXIDE MONITORING NETWORK

### 2011 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. Please see **Appendix A** for Pima County's plan for near-road monitoring.

**2011 NO<sub>2</sub> Design Criteria**  
**Table 15**

| <b>Population Pima County 2010 Census</b> | <b>MSA Tucson Population Category</b> | <b>Annual Design Value</b> | <b>1- Hour 98<sup>th</sup> Percentile Design Value</b> | <b># of Required NO<sub>2</sub> Monitors</b> | <b># of NO<sub>2</sub> Monitors</b> |
|---|---------------------------------------|----------------------------|--|--|-------------------------------------|
| 980,263                                   | 500,000 – 1,000,000                   | 12.06 ppb                  | 46 ppb   | No Requirement                               | 1 SLAMS Monitor                     |
|   |                                       |                            |  | 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 2011. 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 0.008 - 0.019 ppm, 0.02 – 0.049 ppm and 0.05 – 0.099 ppm . All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis. 2011 precision and accuracy tests will be reported in ppb.

**Table 16**

| <b>Nitrogen Dioxide Audit Dates 2011</b>      |
|---|
| Craycroft & 22 <sup>nd</sup> St. 06/20, 12/19 |
| Children's Park 03/25, 09/19                  |
| <b>Nitrogen Dioxide TTP Audit Dates 2011</b>  |
| None  |

## NITROGEN DIOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>22<sup>ND</sup> STREET &amp; CRAYCROFT</b>  |   |
| <b>AQS ID</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>Site type</b>   | Population Exposure  |   |
| <b>Monitor type</b>  | SLAMS  |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 8659   |   |
| <b>Annual arithmetic mean</b>  | 12.06 ppb  |   |
| <b>Number of exceedances in 2011</b>                                 | 0  |   |
| <b>Sampling frequency/ season</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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 22.0 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | <b>1</b>   | 260 meters west is Craycroft Road with 2010 ADT of 30,000             |
|  | <b>2</b>   | 260 meters north is 22 <sup>nd</sup> Street with a 2010 ADT of 46,000 |
|  |  |   |
| <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

### 2011 Ambient Air Monitoring Network Plan

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



**Annual summary statistics:** NAAQS: 100 ppb 1- Hour Average (98<sup>th</sup> percentile of the 1-hour concentrations averaged over three years); 53 ppb Annual Average

| 1 – Hour Average Concentrations | ppb  | Date  | Hour | 1–Hour 98 <sup>th</sup> Percentile | Annual Mean |
|---------------------------------|------|-------|------|------------------------------------|-------------|
| Highest                         | 50.5 | 10/21 | 1900 | 47.0                               | 12.06       |
| Second Highest                  | 50.2 | 11/30 | 1800 |                                    |             |

## NITROGEN DIOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>CHILDREN'S PARK NCore</b>   |   |
| <b>AQS ID</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>Site type</b>   | Highest Concentration  |   |
| <b>Monitor type</b>  | Special Purpose / Proposed NCore   |   |
| <b>Scale</b>   | neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 8545   |   |
| <b>Annual arithmetic mean</b>  | 11.67 ppb  |   |
| <b>Number of exceedances in 2011</b>                                 | 0  |   |
| <b>Sampling frequency/ season</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>                              | 360  |   |
| <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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 12.8 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2  | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
|  |  |   |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |   |

NITROGEN DIOXIDE MONITORING NETWORK

2011 Ambient Air Monitoring Network Plan

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



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

**Annual summary statistics:** NAAQS: 100 ppb 1- Hour Average (98<sup>th</sup> percentile of the 1-hour concentrations averaged over three years); 53 ppb Annual Average

| 1 – Hour Average Concentrations | ppb  | Date  | Hour | 1–Hour 98 <sup>th</sup> Percentile | Annual Mean |
|---------------------------------|------|-------|------|------------------------------------|-------------|
| Highest                         | 46.1 | 10/14 | 2000 | 42.2                               | 11.67       |
| Second Highest                  | 45.6 | 10/13 | 2000 |                                    |             |

## REACTIVE OXIDES OF NITROGEN (NO<sub>y</sub>) MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>CHILDREN'S PARK NCore</b>   |   |
| <b>AQS ID</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>  | 574  |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Type of monitor</b>   | Instrumental Chemiluminescence   |   |
| <b>Site type</b>   | Population Exposure  |   |
| <b>Monitor type</b>  | Special Purpose / Proposed NCore   |   |
| <b>Scale</b>   | neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 8601   |   |
| <b>Annual arithmetic mean</b>  | 15.7   |   |
| <b>Sampling frequency/ season</b>                                    | Continuous   |   |
| <b>Probe height</b>  | 10.0 meters above the ground on a shelter located in a city water well site  |   |
| <b>Probe material / Residence time</b>                               | FEP Teflon / <3.0 seconds  |   |
| <b>Surrounding landscape</b>   | Gravel in walled compound, dirt parking lot, dry river bed   |   |
| <b>Degrees of unrestricted air flow</b>                              | 360  |   |
| <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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 12.8 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2  | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
|  |  |   |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |   |

## REACTIVE OXIDES OF NITROGEN (NO<sub>y</sub>) MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

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



**Comments:** The site began monitoring for reactive oxides of nitrogen in October, 2010 for the NCore site requirements, using a Thermo 42i-y instrument with remote converter mounted at the requisite 10 meters (see photo, mast left).

#### Annual summary statistics:

| 1 – Hour Average Concentrations | ppb   | Date  | Hour | Annual Mean |
|---------------------------------|-------|-------|------|-------------|
| Highest                         | 156.2 | 12/07 | 0800 | 15.7        |
| Second Highest                  | 129.3 | 12/07 | 0900 |             |

## SULFUR DIOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

Sulfur Dioxide (SO<sub>2</sub>) is currently monitored at one location in Pima County. On October 1, 2010, an SO<sub>2</sub> trace monitor was added at the Children's Park NCore location as required for an NCore site. The SO<sub>2</sub> monitor at the 22<sup>nd</sup> and Craycroft was discontinued on December 31, 2010.

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.

**2011 SO<sub>2</sub> Design Criteria**

Table 17

| <b>Population<br/>Pima County<br/>2010 Census</b> | <b>MSA<br/>Tucson<br/>Population<br/>Category</b> | <b>Total<br/>SO<sub>2</sub><br/>[tons/year]<br/>Based on<br/>2008 NEI</b> | <b>Population<br/>Weighted<br/>Emissions<br/>Index<br/>[million<br/>persons- tons<br/>per year]</b> | <b>1- Hour<br/>Design<br/>Value</b> | <b># of Required<br/>SO<sub>2</sub> Monitors</b> | <b># of SO<sub>2</sub><br/>Monitors</b> |
|---|---|---|---|-------------------------------------|--|---|
| 980,263   | 500,000 –<br>1,000,000                            | 4850  | 4754  | 4.0 ppb*                            | No Requirement                                   | 1 proposed<br>NCore                     |
|   |   |   |   |                                     |  |   |

\* The design value is based on a limited number of samples. Sampling began 10/1/2010.

#### 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. With new trace SO<sub>2</sub> monitoring we can now get more accurate readings at very low levels. 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 2011. 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 0.008 - 0.019 ppm, 0.02 – 0.049 ppm and 0.05 – 0.099ppm . All valid precision and accuracy tests are reported to the Air Quality System (AQS) database on a quarterly basis.

**Table 18**

|   |
|---|
| <b>Sulfure Dioxide Audit Dates 2011</b>     |
| Children's Park NCore 03/25, 09/19          |
| <b>Sulfure Dioxide TTP Audit Dates 2011</b> |
| None  |

**SULFUR DIOXIDE MONITORING NETWORK**

**2011 Ambient Air Monitoring Network Plan**

|  |  |   |
|--|--|---|
| <b>Site Name</b>   | <b>CHILDREN PARK NCore</b>   |   |
| <b>AQS ID</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>  | 560  |   |
| <b>Number of monitors</b>  | 1  |   |
| <b>Type of monitor</b>   | Instrumental Pulsed Fluorescent  |   |
| <b>Site type</b>   | Population Exposure  |   |
| <b>Monitor type</b>  | Proposed NCore   |   |
| <b>Scale</b>   | Neighborhood   |   |
| <b>Number of hourly observations</b>                                 | 8542   |   |
| <b>Annual arithmetic mean</b>  | 0.28 ppb   |   |
| <b>Number /dates of 24-hour standard exceedances in 2011</b>         | 0  |   |
| <b>Sampling frequency/ season</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>                              | 360  |   |
| <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>Distance from supporting structure</b>                            | n/a  |   |
| <b>Distance from obstruction on roof</b>                             | n/a  |   |
| <b>Distance from obstruction not on roof</b>                         | n/a  |   |
| <b>Distance from trees</b>   | 12.8 meters  |   |
| <b>Distance to furnace or incinerator flue</b>                       | n/a  |   |
| <b>Distance between collocated monitors/ collocated monitor type</b> | n/a  |   |
| <b>Nearest roads distance &amp; direction to monitor /ADT</b>        | 1  | Arizona State Route 77 runs north - south 0.5 kilometers to the east, providing six lanes of heavily used arterial routing with a 2008 ADT of 43,000. |
|  | 2  | River Road runs east – west 0.5 kilometers to the north, with a 2010 ADT of 38,000.   |
|  |  |   |
| <b>Site meets 40 CFR 58, Appx. A,C,D,E</b>                           | Yes  |   |

## SULFUR DIOXIDE MONITORING NETWORK

### 2011 Ambient Air Monitoring Network Plan

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



**Annual summary statistics:** NAAQS: 75 ppb 1- Hour Average (99<sup>th</sup> percentile of the 1- hour daily maximum concentrations, averaged over 3 years)

| 1 – Hour Average Concentrations | ppb  | Date  | Hour | 1- Hour 99 <sup>th</sup> Percentile |
|---------------------------------|------|-------|------|-------------------------------------|
| Highest                         | 12.4 | 06/10 | 0800 | 5.9 ppb                             |
| Second Highest                  | 7.8  | 06/21 | 0800 |                                     |

## LEAD MONITORING NETWORK

### 2011 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 NCore location. Monitoring and reporting is anticipated to commence in January, 2012.

**Table 19**

| <b>NCore Site</b>            | <b>MSA Tucson Population Category</b> | <b>Population Pima County 2010 Census</b> | <b># Required Monitors</b> | <b># Monitors Anticipated</b> | <b># Additional Monitors Needed</b> |
|------------------------------|---------------------------------------|---|----------------------------|-------------------------------|-------------------------------------|
| Children’s Park<br>040191028 | 500,000 –<br>1,000,000                | 980,263                                   | 1                          | 1 –primary<br>1- colocated    | 0                                   |

### 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 Magnetic Observatory 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.

# **2011 Ambient Air Monitoring Network Plan**

## **Appendix A**

### **Pima County Ambient Air Monitoring Work Plan For Near-Road Nitrogen Dioxide Monitoring Station**

Pima County Department of Environmental Quality  
33 N. Stone Ave., Suite 700  
Tucson, Arizona 85701

On February 9, 2010, new minimum monitoring requirements for the nitrogen dioxide (NO<sub>2</sub>) monitoring network were promulgated (75 FR 6474) in support of a revised National Ambient Air Quality Standard (NAAQS) for NO<sub>2</sub>. The NO<sub>2</sub> NAAQS was revised to include a 1-hour standard with a 98<sup>th</sup> percentile form and a level of 100 ppb, reflecting the maximum allowable NO<sub>2</sub> concentration anywhere in an area, while retaining the annual standard of 53 ppb. In the latest NO<sub>2</sub> Risk and Exposure Assessment created during the NAAQS revision process, and as reiterated in the preambles to the Notice of Proposed Rulemaking (NPR for NO<sub>2</sub>) (74 FR 34404) and the Notice of Final Rulemaking (NFR for NO<sub>2</sub>) (75 FR 6474) on the Primary NAAQS for NO<sub>2</sub>, the EPA recognized that roadway-associated exposures account for a majority of ambient exposures to peak NO<sub>2</sub> concentrations.

In the NPR, the EPA states that the populations included in that assessment were people who live, work, play, or go to school near major roads, as well as those people who spend time commuting on major roads (74 FR 34419).

Requirements for near-road monitors are based upon population levels and a specific traffic metric within Core Based Statistical Areas (CBSAs). State and local ambient air monitoring agencies are required (per 40 CFR Part 58 Appendix D, Section 4.3.2.a) to use the latest available census figures (e.g., census counts and/or estimates) and available traffic data in assessing what may be required of them under this new rule. Further, state and local air agencies are required to consider traffic volumes, fleet mix, roadway design, traffic congestion patterns, local terrain or topography, and meteorology in determining where a required near-road NO<sub>2</sub> monitor should be placed.

The required near-road NO<sub>2</sub> monitoring network is to be implemented and operational by January 1, 2014. State and local ambient air monitoring agencies are required to submit their plans for any required near-road NO<sub>2</sub> monitoring stations in their annual monitoring network plans due July 1, 2012.

With a population in the Pima County CBSA greater than 500,000, but less than 2,500,000, and no roadway segments carrying traffic volumes of 250,000 or more vehicles (as measured by annual average daily traffic [AADT] counts), Pima County meets the criteria for operating one near-road NO<sub>2</sub> station. Implementation is divided into three phases, with Phase One originally set to be operational by January 1, 2013, but due to logistical difficulties, this date has been pushed to 2014. Pima County is not included in Phase One, and therefore, is only required to submit plans for a station installation at some point in the future, when funding becomes available, and if Phases Two and Three reach implementation in 2015 and 2017, respectfully.

To arrive at an appropriate combination of the aforementioned physical considerations, and population representation, site selection in Pima County defaults to locations along Interstates 10 and 19, both controlled access roads representing the highest traffic volumes available in the CBSA, and becomes a process more of where *can* a station be installed, and not so much where a station *should* be installed. For a variety of logistical reasons, those locations meeting most of the physical considerations and representing very nearby populations, are simply not achievable. Therefore, site selection evolved to those roadway segments where a station would both successfully fulfill the requirements, and be logistically possible.

Pima County DEQ Air Monitoring and Analysis staff examined available traffic data, satellite imagery, meteorology, local topography and roadway design, and located several candidate

locations. Two of those locations are presented here. All aerial photographs are oriented with north at the top of the photo.

The first location represents the highest probable NO<sub>2</sub> concentrations likely to occur within the Pima County CBSA. This location is near Interstate 10 and Sweetwater Drive, and places the probe within 50 meters of the inside traffic lane. There is no grade separation between the traffic lanes and probe, and there is no sound barrier or safety barrier between opposing traffic lanes. Both sides of the roadway have two-lane frontage roads, and the westbound lanes have an on-ramp merge lane. Traffic volume is listed at 153,000 AADT. Fleet mix data indicates that 3.1% of traffic volume is heavy truck, 2.2% is non-articulated truck, for a combined T Factor of 5.3% heavy-duty vehicles (Arizona DOT, 2010). Not shown in the photo are the Southern Pacific railroad tracks, which run parallel to the interstate, on the side opposite the shelter location. In the aerial photo below, the red square represents the shelter location, the red line represents the distance between probe and inside traffic lane, and the blue line represents probe to shelter distance. The trees between the frontage road and main roadway are typical of manicured desert vegetation and do not pose significant blockage to air flow, maintaining a relatively open fetch. Similarly, the white-roofed structures are chain-link enclosures with shade covers.



Location 1

The photo below shows the first potential location (within the red box) in an area-wide aerial photo, with low-income housing throughout most of the photo, to the northeast of the interstate.



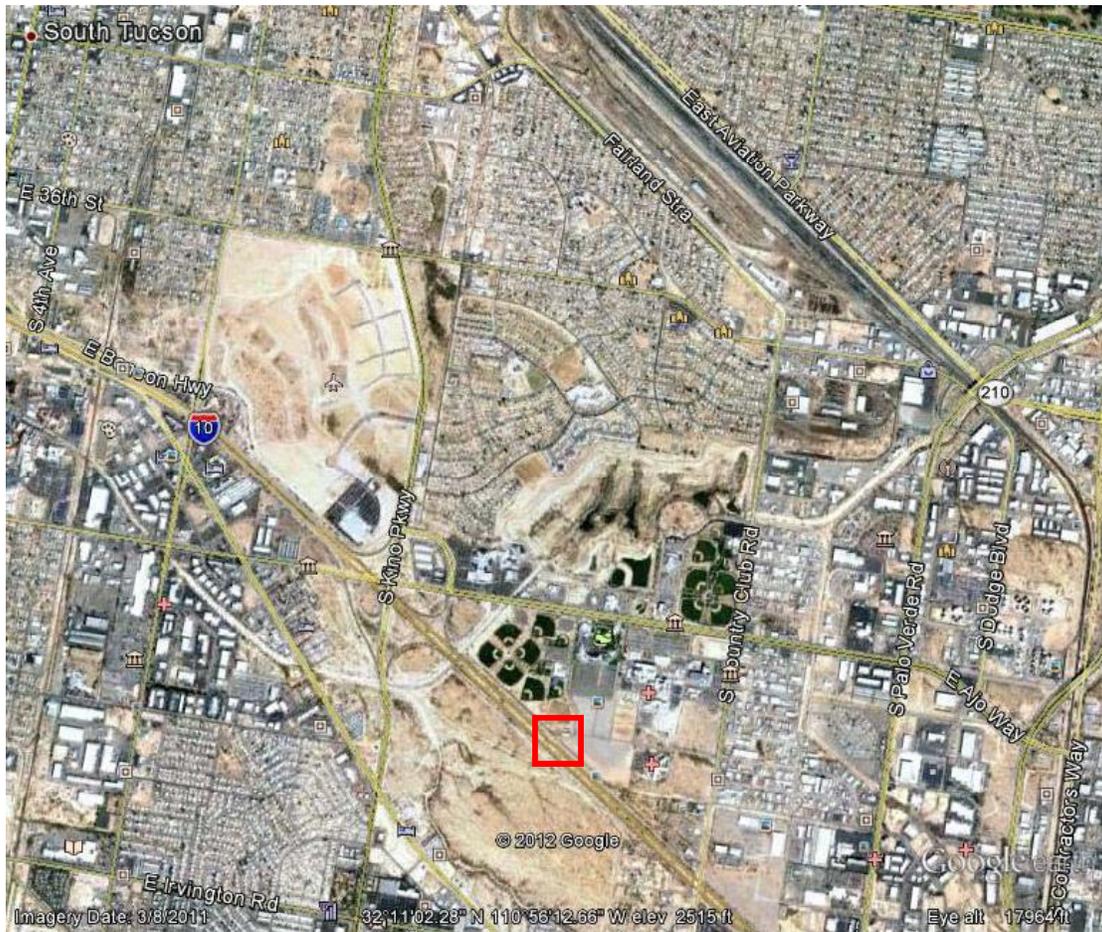
Location 1

The second location is also along Interstate 10 on the opposite side of the city of Tucson, between Kino Parkway and Country Club Road. The probe would be within 50 meters of the inside traffic lane. There is approximately three meters of grade separation between the traffic lanes and probe location, which would be negated by probe height, and there is no sound barrier or safety barrier between opposing traffic lanes. There is no frontage road, or on /off ramps at this location. Traffic volume is listed at 57,500 AADT. Fleet mix data indicates that 3.1% of traffic volume is heavy truck, 2.2% is non-articulated truck, for a combined T Factor of 5.3% (Arizona DOT, 2010). In the aerial photo below, the red square represents the shelter location and the red line represents the distance between probe and inside traffic lane. There are some scraggly bushes and a shallow drainage channel between the shelter location and the traffic lanes, but neither is of sufficient significance to compromise an open fetch.



Location 2

The photo below shows the second potential location (within the red box) in an area-wide aerial photo, with Tucson Electric Park ball fields directly to the northwest.



Location 2

There are road segments along Interstate 10 with higher traffic counts, but these segments are all significantly fill elevated, with multi-lane frontage roads on both sides of the Interstate, and commercial enterprises along the frontage roads. Fleet mix is the same on all of Interstate 10 through Tucson, so that is not a factor in the deliberation process. Establishing a monitoring station on these higher-traffic count segments would be inappropriate due to the elevated roadway, safety barriers, sound walls and probe distance from traffic lanes.

Traffic counts on Interstate 19 on road segments near the I-10 / I-19 interchange are similar to Interstate 10 at the second location, as is fleet mix. Because of this, and increased difficulty with the logistics of station installation, Interstate 19 was not included in the final site selection process beyond identifying the aforementioned similarities to the second location on I-10.

In conclusion, Pima County DEQ Air Monitoring and Analysis staff is confident that either of the two locations identified in this Appendix would satisfy the requirements for near-road NO<sub>2</sub> monitoring, and both would be logistically possible. Both locations are on property owned by Pima County, which would minimize inter-agency involvement and complication. Power and communications are easily available, and it may be possible to improve probe to roadway distance at either location.