DAQEM

DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

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Lewis Wallenmeyer Director · Tina Gingras Assistant Director

June 30, 2010

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

RE: 5-Year Network Assessment

Dear Mr. Lakin:

The Clark County Department of Air Quality and Environmental Management (DAQEM) is pleased to present the "5-Year Network Assessment" required by Title 40, Part 58 of the Code of Federal Regulations. The assessment provides documentation of all previous monitoring in Clark County and makes recommendations to shut down existing monitoring sites and to examine other areas for potential new sites. Recommendations are based on EPA analysis tools, situational analysis and input from known data users.

If you have questions related to this assessment, please contact Mike Sword, P.E., AQ Engineering Manager at (702) 455-1615.

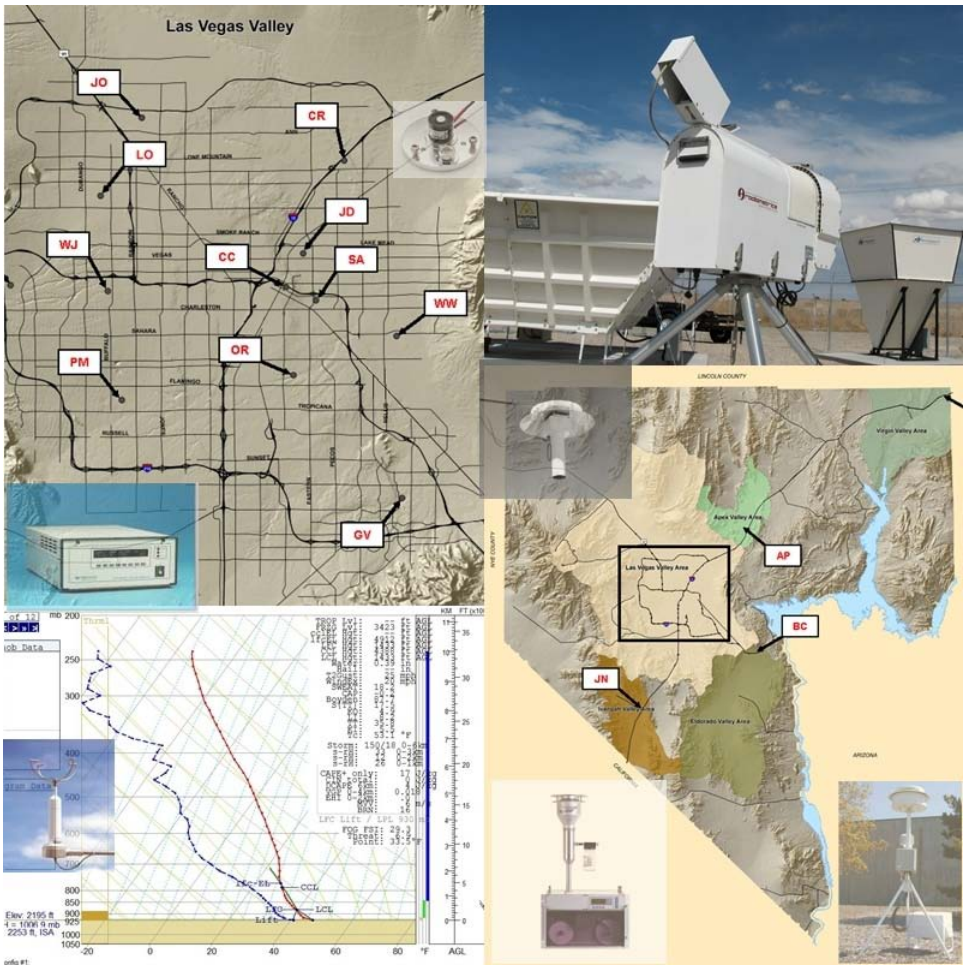
Sincerely,

Tina M. Gingras
Assistant Director

cc: Michael Flagg, EPA

CLARK COUNTY
DEPARTMENT OF AIR QUALITY
AND ENVIRONMENTAL MANAGEMENT

FIVE-YEAR NETWORK ASSESSMENT



June 30, 2010

Signatures

The *Five-Year Network Assessment* is reviewed and approved for submission to EPA:

for JM Gregas

Lewis Wallenmeyer
Director

Distribution

The *Five-Year Network Assessment* shall be distributed as follows:

Organization	Title	Location
EPA Region 9	Regional Administrator	San Francisco, CA
DAQEM	Quality System Manager; Planning Division	Las Vegas, NV
Engineering Division	Quality Assurance Officer	Las Vegas, NV
Monitoring Section	Quality Control Supervisor; Technicians	Las Vegas, NV

Foreword

The *Five Year Network Assessment* was written in part to address internal operational needs and in part to address the U.S. Environmental Protection Agency's five-year network assessment requirement.

Executive Summary

This assessment is one outcome of the U.S. Environmental Protection Agency (EPA) implementation of the National Ambient Air Monitoring Strategy. The purpose of the strategy is to optimize national air monitoring networks to achieve, with limited resources, the best possible scientific value and protection of public and environmental health and welfare.

On October 17, 2006, EPA finalized an amendment to the monitoring regulations for ambient air that required monitoring agencies to conduct a network assessment once every five years (40 CFR 58.10(d)). This is the first five-year assessment for Clark County; its primary objectives are to put forth a historical summary of the county monitoring network, describe pollutant studies the county has conducted, and profile users of Clark County monitoring data.

The history of the network spans 53 years (dating back to 1957) and approximately 71 monitoring sites. The history is represented and summarized on 43 maps in Appendix A.

The assessment provides the following recommendations.

1. Maintain these sites during the next five years:

    - Paul Meyer
    - Boulder City
    - Jean
    - Joe Neal
    - Palo Verde
    - Sunrise Acres
    - Walter Johnson
    - Green Valley.

2. Close[1] these sites:

    - Craig Road
    - Mesquite
    - Orr
    - Apex
    - East Sahara
    - Lone Mountain.

3. Evaluate the following areas for potential new sites:

    - Ozone
        - Two locations in California: in Death Valley and at the state border along the I-15 corridor.

[1] The need to close monitoring sites is the result of declining funds.

- One location in Pahrump Valley.
- One location in the mountain range west of the Las Vegas Valley.
- One location on the Paiute tribal reservation.
- One location in Indian Springs.
- One location in the northwest foothills.
- One location in the Craig Ranch area.
- One location at Black Mountain.

- $PM_{2.5}$
  - Two locations along the I-15 corridor: at the southern and northeastern entrances to the Las Vegas Valley.
  - One location in Sunrise Manor, in the mountain ranges east of the Las Vegas Valley.

- PM_{10}
  - Location(s) in the southwest and extreme south of the Las Vegas Valley, and in Sandy Valley.

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ACRONYMS AND ABBREVIATIONS

Acronyms

ALA	American Lung Association
AQS	Air Quality System
BAM	beta attenuation monitor
CAA	Clean Air Act
CFR	Code of Federal Regulation
DAQEM	Clark County Department of Air Quality and Environmental Management
EPA	U.S. Environmental Protection Agency
FRM	federal reference method
NAAQS	National Ambient Air Quality Standards
SIP	state implementation plan
SNHD	Southern Nevada Health District
TSP	total suspended particulates

Abbreviations

CO	carbon monoxide
H_2S	hydrogen sulfide
hi-vol	high-volume sampler
NH_3	ammonia
ID	(site) identification
NO_x	oxides of nitrogen
O_3	ozone
PM	particulate matter
ppm	parts per million
SO_2	sulfur dioxide

1.0 REGULATORY REQUIREMENT

On October 17, 2006, the U.S. Environmental Protection Agency (EPA) finalized an amendment to the ambient air monitoring regulations. In Title 40, Part 58.10(d) of the Code of Federal Regulations (40 CFR 58.10(d)), the EPA added the following requirement for state, or where applicable local, monitoring agencies to conduct network assessments once every five years:

> The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For PM2.5, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The first assessment is due July 1, 2010.

This requirement is an outcome of the EPA implementation of the National Ambient Air Monitoring Strategy, the most recent version of which is dated December 2005. The purpose of the strategy is to optimize national air monitoring networks to achieve, with limited resources, the best possible scientific value and protection of public and environmental health and welfare.

2.0 METHODOLOGY

A project management approach, as described in the Clark County Department of Air Quality and Environmental Management (DAQEM) quality system, provided the framework to evaluate the existing monitoring network design. The assessment included the following:

- Historical review of the network.
- Historical review of pollutant studies performed within Clark County.
- Survey of known data users.
- Review of climatological and topographical conditions.
- Review of population growth.
- Review of applicable monitoring requirements.
- Use of analysis tools developed by EPA.
- Situational analysis (e.g., shelter condition, safety, budget).
- Analysis to rank sites in current network.

In addition, a particular effort was made to identify previously unknown data users.

2.1 HISTORICAL REVIEW OF THE NETWORK

Staff reviewed Air Quality System (AQS) and DAQEM records to identify every known site that had ever operated in Clark County for the stated purpose of monitoring ambient air pollution. Section 3 lists these sites, along with operating dates and pollutants monitored. Monitoring objectives, concentrations measured, and pollutant trends have been reviewed and charted as accurately as possible with the information available. This document also provides explanations, to the extent known, of the development of the air monitoring network over time, including the motivations and circumstances behind network alterations, such as political will, changes in regulatory requirements, and resource availability.

2.2 HISTORICAL REVIEW OF POLLUTANT STUDIES PERFORMED WITHIN CLARK COUNTY

Over the years, and often in support of state implementation plan (SIP) development, DAQEM has conducted many air quality studies. Staff reviewed these studies, which primarily provided recommendations on pollutant-specific improvements to the monitoring network, and compiled a list of their recommendations. The relevant studies are:

- *Southwest Desert/Las Vegas Ozone Transport Study* (SLOTS) (July 2008)
- *Ozone Characterization Study* (January 2006)
- *Clark County Regional Ozone & Precursors Study* (CCROPS) (March 2006)
- *Carbon Monoxide Saturation Study* (CMSS) (April 2002)

- *PM_{10} Saturation Study* (February 2007).

2.3 ANALYSIS TOOLS

EPA has developed several analysis tools to assist state and local agencies in performing network assessments. The tools selected for this assessment included:

- Area Served - sites are ranked based on their area of coverage.
- Correlation Matrix - shows the correlation between, relative difference of, and distance between pairs of sites.
- New Sites - shows potential locations for new sites based on the 2008 monitoring network.
- Removal Bias - estimates the concentration at the site if the site did not exist.

2.4 SITUATIONAL ANALYSIS

Issues unique to monitoring network operations in Clark County include the serviceability of shelters, safety issues, and the availability of operating resources, e.g., budget, personnel, and equipment condition.

Most of these issues relate to the ability to continue operations. With the recent economic downturn, the operating budget has been significantly reduced and the capital budget to replace or upgrade equipment has been eliminated. All efforts to identify and install new sites have been placed on hold until money specifically slated for the purpose becomes available or the economic situation reverses.

2.5 INPUT FROM KNOWN DATA USERS

As part of ongoing efforts to support local organizations concerned with community health and welfare, DAQEM maintains a database of contacts that have requested monitoring data for health studies, weather forecasts, or other uses. Section 5 describes these users and their purposes for the requested data, along with organizations that have expressed an interest in monitoring data or local health issues. DAQEM then asked these users if they knew of other organizations that might have an interest in using monitoring data for health-based or other studies. With this information, DAQEM was able to develop a list and obtain input from end users, potential end users, and local organizations on their uses of the monitoring data collected for Clark County.

2.6 RESULTS

The results of the assessment are presented in terms of priorities.

The first priority is sites that must remain: examples include, but are not limited to, sites required by SIP commitments, sites required by court order or settlement, sites required by unique status

(e.g., the only maximum concentration site), sites required by political will, and sites required by statute, ordinance, or grant.

The second priority is sites that must be closed: examples include locations with problematic leases or other legal challenges, shelters with significant expenses related to correcting safety or code deficiencies, and sites that must be closed to accommodate limited budget and resources. The final priorities are identifying future locations and evaluating future monitoring needs.

2.7 RECOMMENDATIONS

Recommendations were provided based on the prioritized results of the assessment. Areas identified for potential new sites were also included.

2.8 GUIDANCE DOCUMENTS

Two EPA documents provided analytical techniques and a discussion of assessment goals and objectives:

- "Ambient Air Monitoring Network Assessment Guidance" (February 2007)
- "Network Assessment Analyses and Tools Documentation" (April 28, 2010).

3.0 HISTORICAL SUMMARY OF AIR QUALITY MONITORING IN LAS VEGAS

Monitoring in Clark County started in 1957, well before the passage of the Clean Air Act (CAA) in 1970. There have been a total of 71 monitoring sites in the 53 years since then, 16 of which are still operating. Appendix A contains 43 maps showing the locations of pollutants monitored since 1957. Appendix B contains trend plots of pollutant concentrations for approximately the last 10 years.

This section contains brief descriptions of all air monitoring sites in Clark County, past and present. The reason for starting or terminating a site is also provided, if known. The driver to start most sites was political will; however, the reasons to end sites are many and include, but are not limited to, political will, loss of lease, development of surrounding area with noncompatible uses (or uses that created siting conflicts), trend analyses showing low pollutant concentrations, or network redundancy. Operating dates and location information are given for each site, and if known, a brief explanation of sampling methods and schedules.

Sites in the EPA AQS database are listed first. Site identifications (IDs) are created sequentially as each new site is opened; the list below is organized by site ID, from oldest to newest. Sites that are not in the AQS database follow, listed chronologically by date established. For completeness, descriptions of existing sites also provide current monitoring objective(s) and spatial scale(s).

In addition to mapping the 71 sites described in this section, the 43 maps in Appendix A show the location of pollen sites within Clark County. Aside from this, the pollen network is not discussed in this assessment; future assessments will not reference pollen at all, since the pollen monitoring network will be shut down at the end of 2010.

Site ID: 32-003-0001 (pre-CAA)

Street Address: 500 Railroad St. City: Boulder City
Date Established: 01/01/1966 Date Terminated: 4/26/1984
Site Latitude: +35.982222 Site Longitude: -114.835000

This was one of the earliest air monitoring locations in Clark County; it pre-dates the CAA. It used very early monitoring techniques, such as total dustfall, sulfation rate, silver tarnishing, dyed fabric, rubber cracking, and nylon deterioration. The actual discontinuation date of the site appears to be 12/31/1969; however, the closure date in AQS is 4/26/1984, which reflects the date entered to officially close this site in the EPA database.

Reason for site closure was low measured results.

Site ID: 32-003-0002 (Nellis)

Street Address: Nellis Operations Bldg. City: Sunrise Manor
Date Established: 01/01/1972 Date Terminated: 12/31/1977

Site Latitude: +36.245547 Site Longitude: -115.036112

As evidenced by the street address, this site was located on the Nellis Air Force Base in the northeast part of the Las Vegas Valley. The method used was a high volume sampler (hi-vol) that monitored total suspended particulates (TSP). It operated on a 1 in 6 day sampling frequency.

Reason for site closure is unknown.

Site ID: 32-003-0003 (Fish & Game)

Street Address: 601 Nevada Hwy. City: Boulder City
Date Established: 01/01/1972 Date Terminated: 06/30/1981
Site Latitude: +35.981944 Site Longitude: -114.835000

This site operated at the corner of Wyoming Street and Nevada Highway in Boulder City. The method used was a hi-vol monitoring TSP, which operated on a 1 in 6 day sampling frequency.

Reason for site closure was low measured results.

Site ID: 32-003-0004 (Pittman PO)

Street Address: 1540 Boulder Hwy. City: Henderson
Date Established: 01/01/1972 Date Terminated: 1/11/1981
Site Latitude: +36.032778 Site Longitude: -114.983889

This site operated on the roof of a post office in Henderson. The method used was a hi-vol monitoring TSP, which operated on a 1 in 6 day sampling frequency.

Reason for site closure was low measured results.

Site ID: 32-003-0005 (Burkholder)

Street Address: 355 W. Van Wagenen St. City: Henderson
Date Established: 01/01/1972 Date Terminated: 12/31/1994
Site Latitude: +36.031111 Site Longitude: -115.144167

This site operated at Burkholder Middle School in Henderson, originally Basic High School. The school became Burkholder Junior High in August 1985, then Burkholder Middle School. The site originally monitored TSP using the hi-vol method; it also began monitoring PM_{10} in 1987, and TSP monitoring was discontinued 12/31/88. The site also monitored pollen from 1988 to 2003.

Reason for site closure was implementation of continuous PM_{10} technology at a neighboring site.

Site ID: 32-003-0006 (Sunset Rd)

Street Address: Pump Station, Sunset Rd. City: Henderson
Date Established: 01/01/1975 Date Terminated: 03/23/1977
Site Latitude: +36.063328 Site Longitude: -115.057777

This site was located at a Las Vegas Valley Water District pumping station on Sunset Road in Henderson. It monitored sulfur dioxide (SO_2).

Reason for site closure is unknown.

Site ID: 32-003-0007 (Powerline/SE Valley)

Street Address: 545 Lake Mead Dr. City: Henderson
Date Established: 01/01/1980 Date Terminated: 12/31/2007
Site Latitude: +36.028889 Site Longitude: -114.988889

This site was initially called "Powerline," later "Southeast Valley" and, eventually, "Henderson." It is located directly south of the Black Mountain, Inc. (BMI) complex, originally known as Basic Management, Inc. At the site's inception, several industrial companies—including Kerr-McGee, Stauffer, and Timet—were operating directly north of it. Originally, the site monitored ozone (O_3) and ammonia (NH_3). In the early to mid-1980s, however, it became part of several studies to determine the makeup of the "Henderson Cloud," a white cloud that formed, especially during the winter months, as a result of chlorine and ammonia emissions from the chemical plants. These emissions produced photochemical compounds such as ozone, ammonium chloride, and peroxyacetyl nitrate; because of the monitoring studies, the facilities in the BMI complex implemented increased pollutant controls. The pollutants that have been measured at this site include carbon monoxide, ozone, chlorine, ammonia, PM_{10}, peroxyacetyl nitrate, total hydrocarbons, and visibility (nephelometer).

The site was discontinued on 12/31/2007 as a result of ongoing safety challenges.

Site ID: 32-003-0008 (SNAP)

Street Address: 1239 N. Boulder Hwy. City: Henderson
Date Established: 01/01/1983 Date Terminated: 06/30/1987
Site Latitude: +36.057778 Site Longitude: -115.001667

This site was located in the southeast corner of the Southern Nevada Auto Parts (SNAP) facility. It was used as a downwind site for the BMI complex, measuring NH_3 and TSP.

There was some controversy over this site because an adjacent property directly south of it had a small collection of livestock, including a horse, goat, and peacock. These animals may have interfered with ammonia measurements: although the ammonia analyzer was housed in a small wooden shed, the hi-vol was mounted on top of a large wooden tower and the peacock often roosted on top of it.

Reasons for site closure were low measured results and a lack of value in monitoring NH_3.

Site ID: 32-003-0009 (Shadow Lane 1)

Street Address: 625 Shadow Lane
City: Las Vegas
Date Established: 01/01/1972
Date Terminated: 12/31/1981
Site Latitude: +36.163889
Site Longitude: -115.163333

This site was located in the center of the Las Vegas Valley. Though it primarily monitored TSP, data from it was also submitted for O_3, oxides of nitrogen (NO_x), and carbon monoxide (CO). Another Shadow Lane site that reported data briefly is described later.

This site was also the location of the air quality agency in Clark County from its inception in 1965 through May 2001.

Reason for site closure was low measured results.

Site ID: 32-003-0010 (LVFD 2)

Street Address: 2801 E. Charleston Blvd.
City: Las Vegas
Date Established: 03/01/1973
Date Terminated: 06/30/1989
Site Latitude: +36.158889
Site Longitude: -115.110278

This site was located in the east-central area of the Las Vegas Valley. It was known as Las Vegas Fire Department No. 2, and sampling consisted of collocated TSP hi-vols. The primary sampler was used for lead analysis. With the discontinuation of leaded gasoline, lead values in Las Vegas became almost nonexistent and the site was shut down; however, data from the site continued to be reported until 12/31/1993 under site ID 32-003-1010.

Reason for site closure was low measured lead levels.

Site ID: 32-003-0011 (LV Wash)

Street Address: Park Service Bldg., Las Vegas Wash Marina
City: Las Vegas
Date Established: 01/01/1972
Date Terminated: 12/31/1993
Site Latitude: +36.108611
Site Longitude: -114.833611

This site at the Lake Mead fish hatchery sampled TSP using a hi-vol.

The site closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insufficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-0012 (Logandale)

Street Address: Whitney residence, Whipple Rd. City: Logandale
Date Established: 01/01/1972 Date Terminated: 12/31/1981
Site Latitude: +36.597778 Site Longitude: -114.484722

A TSP hi-vol operated at this location as a background monitor. The hi-vol was located on the roof of the Whitney residence; Mr. Whitney agreed to change the filters after every run and mail them to the air quality agency. However, Mrs. Whitney's failing health forced the family to relocate to a moister climate, and the site was shut down.

Reason for site closure was loss of lease.

Site ID: 32-003-0013 (Arden)

Street Address: Civil Defense Bldg, Arden City: Enterprise
Date Established: 01/01/1972 Date Terminated: 12/31/1974
Site Latitude: +36.016383 Site Longitude: -115.236393

This site in the southwest Las Vegas Valley measured TSP using a hi-vol.

Since the levels were only background, the site was discontinued.

Site ID: 32-003-0014 (Southwest Gas)

Street Address: 5241 Spring Mtn. Rd. City: Las Vegas
Date Established: 01/01/1977 Date Terminated: 12/31/1988
Site Latitude: +36.124167 Site Longitude: -115.210833

This site measured TSP in the developing southwest part of the valley. The hi-vol was located on the roof of a maintenance shed behind what was then the Southwest Gas Company's main office.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insufficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-0015 (Wildlife Bldg)

Street Address: 4747 Vegas Dr. City: Las Vegas
Date Established: 01/01/1978 Date Terminated: 12/31/1985
Site Latitude: +36.191667 Site Longitude: -115.201667

This site measured TSP in the west-central area of the Las Vegas Valley. The hi-vol was located on the roof of the Nevada Division of Wildlife Building on Vegas Drive.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insuf-

ficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-0016 (City Center)

Street Address: 559 N. 7th St. City: Las Vegas
Date Established: 01/01/1980 Date Terminated:
Site Latitude: +36.174444 Site Longitude: -115.135278

This site was originally located in the parking lot of a post office at 3rd Street and Stewart Avenue. Then known as the Casino Center site, the name was changed to City Center when DAQEM moved it to the current location. At that time, this site was considered the center of the developed Las Vegas valley. Over the years it has measured many pollutants, including CO, O_3, NO_x, TSP, and PM_{10}.

Interstate 515 was constructed within 50 meters of this site. As a result of the increased freeway traffic, NO_x scrubbing and other high-traffic effects were observed in the pollutant data trends. All pollutant monitoring at this site was stopped in April 2006.

Site ID: 32-003-0017 (Wengert)

Street Address: 2001 Winterwood Blvd. City: Las Vegas
Date Established: 09/01/1987 Date Terminated: 12/31/1998
Site Latitude: +36.143333 Site Longitude: -115.051944

This site, located at the Wengert Elementary School on the east side of the valley, originally monitored TSP, but also began measuring PM_{10} in 1988. It was shut down in 1998.

The site was closed after the transition from PM_{10} high-vols to PM_{10} beta-gauge samplers. The site was not able to accommodate the beta-gauge sampler.

Site ID: 32-003-0018 (Katherine's Landing)

Street Address: Across the Colorado River from Katherine's Landing, in AZ City: None
Date Established: 01/01/1974 Date Terminated: 12/31/1979
Site Latitude: +35.211406 Site Longitude: -114.585821

This site, just north of Laughlin, measured TSP.

Reason for site closure was low measured results.

Site ID: 32-003-0019 (Frias)

Street Address: Frias & Schuster City: Las Vegas
Date Established: 05/01/1986 Date Terminated: 12/31/1994

Site Latitude: +36.115000 Site Longitude: -115.191389

This was established as a background site near the southern boundary of the Las Vegas Valley. It measured PM_{10} using a dichotomous sampler.

As the area's population increased, it became clear it would no longer be a suitable background site.

Site ID: 32-003-0020 (Craig Rd)

Street Address: 4701 Mitchell St. City: North Las Vegas
Date Established: 01/01/1992 Date Terminated:
Site Latitude: +36.245278 Site Longitude: -115.092222

This site was originally a permittee requirement for pre/post-construction monitoring. The facility was owned by Bemis, a company that used ammonia in its production. After the permittee met the requirements of the permit, they asked to discontinue monitoring and agreed to turn the site over to DAQEM. EPA requested that we install a downwind O_3 monitor at the site; later on, PM_{10} and $PM_{2.5}$ beta attenuation monitors (BAMs) were added and the ammonia analyzer was shut down. A speciation sampler is now operated at the site, which is in the northeast part of the Las Vegas Valley.

Craig Rd	PM_{10}	$PM_{2.5}$ Continuous	Ozone
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring objective	Highest concentration	Population exposure	Population exposure

Site ID: 32-003-0021 (Shadow Lane 2)

Street Address: 625 Shadow Lane City: Las Vegas
Date Established: 01/01/1991 Date Terminated: 09/30/2001
Site Latitude: +36.163611 Site Longitude: -115.162222

The second of two Shadow Lane sites, this one was established as a gaseous site. Pollutants sampled included CO, O_3, and NO_x.

The site was closed when the air agency was reassigned from the Southern Nevada Health District (SNHD) to Clark County and relocated to a county facility.

Site ID: 32-003-0022 (Apex)

Street Address: 12101 U.S. Hwy. 93 City: Las Vegas
Date Established: 01/01/1998 Date Terminated:
Site Latitude: +36.390775 Site Longitude: -114.906810

This site was set up as a downwind/background site in the Apex Valley, adjacent to the northeast outflow of the Las Vegas Valley. It currently monitors for O_3, $PM_{2.5}$, and PM_{10}; in the past, it has also monitored for NO_x.

DAQEM recently discovered that this site is on the industrial property of an operating quarry and gypsum kiln, whose operations have affected pollutant measurements at the site. Therefore, this site cannot meet any National Ambient Air Quality Standards (NAAQS) demonstration design objective or scale.

In addition, there are no residential uses or populations within the achievable spatial scale of this site. It has no identifiable value for NAAQS monitoring.

Apex	PM_{10}	$PM_{2.5}$ Continuous
Spatial scale	Neighborhood	Neighborhood
Monitoring objective	Source-oriented	Source-oriented

Site ID: 32-003-0023 (Mesquite)

Street Address: 465 E. Old Mill Rd. City: Mesquite
Date Established: 10/01/2001 Date Terminated:
Site Latitude: +36.808060 Site Longitude: -114.060830

This site currently monitors O_3 and PM_{10}. In the past, it has also monitored CO and NO_x.

Mesquite	PM_{10}	Ozone
Spatial scale	Middle	Neighborhood
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-0043 (Paul Meyer)

Street Address: 4525 New Forest Dr. City: Las Vegas
Date Established: 01/01/1998 Date Terminated:
Site Latitude: +36.108056 Site Longitude: -115.253611

This site, in the southwest part of the valley, currently monitors O_3 and PM_{10}; previously, it also monitored CO.

Paul Meyer	PM_{10}	Ozone
Spatial scale	Neighborhood	Neighborhood
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-0071 (Walter Johnson)

Street Address: 7701 Ducharme Ave. City: Las Vegas
Date Established: 07/01/1995 Date Terminated:
Site Latitude: +36.170278 Site Longitude: -115.261389

This site, on the west side of the valley, currently monitors O_3 and occasionally measures the valley's highest 8-hour O_3 levels. Previously, it monitored PM_{10}.

Walter Johnson	Ozone
Spatial scale	Neighborhood
Monitoring objective	Population exposure

Site ID: 32-003-0072 (Lone Mountain)

Street Address: 3525 N. Valadez St. City: Las Vegas
Date Established: 01/01/1998 Date Terminated:
Site Latitude: +36.224722 Site Longitude: -115.266667

This site is located on the west side of the Las Vegas Valley and monitors O_3 and PM_{10}. It often measures the valley's highest 8-hour O_3 levels.

Lone Mountain	PM_{10}	Ozone
Spatial scale	Neighborhood	Neighborhood
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-0073 (Palo Verde)

Street Address: 333 Pavilion Center Dr. City: Las Vegas
Date Established: 07/01/1998 Date Terminated:
Site Latitude: +36.173056 Site Longitude: -115.331667

This is the most western site in the Las Vegas Valley, and sits at the highest elevation. Currently, it monitors O_3 and PM_{10}; previously, it also monitored NO_x and $PM_{2.5}$.

Palo Verde	PM_{10}	Ozone
Spatial scale	Middle	Neighborhood
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-0075 (Joe Neal)

Street Address: 6651 W. Azure Ave. City: Las Vegas
Date Established: 07/01/2000 Date Terminated:
Site Latitude: +36.272382 Site Longitude: -115.238241

This site in the northwest part of the valley monitors NO_x, O_3, and PM_{10}.

Joe Neal	PM_{10}	Ozone	NO_2
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring objective	Population exposure	Highest concentration	Population exposure

Site ID: 32-003-0078 (Searchlight)

Street Address: 103 U.S. Hwy. 95 City: Searchlight
Date Established: 07/01/2000 Date Terminated: 02/25/2004
Site Latitude: +35.465050 Site Longitude: -114.919615

This site monitored O_3, NO_x, and SO_2.

Reasons for site closure were loss of lease and very low concentration trends.

Site ID: 32-003-0107 (Pittman)

Street Address: 1137 N. Boulder Hwy. City: Henderson
Date Established: 01/01/1995 Date Terminated: 02/28/2002
Site Latitude: +36.054444 Site Longitude: -114.997222

This site was downwind of the BMI complex. Pollutants monitored included NH_3, CO and PM_{10}.

Reasons for site closure were low measured results and lack of value in monitoring NH_3.

Site ID: 32-003-0298 (Green Valley)

Street Address: 298 Arroyo Grande Blvd. City: Henderson
Date Established: 01/01/1998 Date Terminated:
Site Latitude: +36.052222 Site Longitude: -115.056944

This site is located in the southeast part of the Las Vegas Valley and currently monitors PM_{10} and $PM_{2.5}$. Previously, it also monitored CO.

Green Valley	PM_{10}	$PM_{2.5}$ Continuous
Spatial scale	Middle	Middle
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-0538 (Winterwood)

Street Address: 5483 Clubhouse Dr. City: Las Vegas
Date Established: 07/01/1979 Date Terminated:
Site Latitude: +36.143056 Site Longitude: -115.051667

This is the easternmost site in the valley, and monitors CO and O_3. DAQEM performed some special-purpose monitoring in response to citizen complaints about odors from nearby sewage treatment plants: specifically, it monitored hydrogen sulfide (H_2S) in the mid-1990s.

Winterwood	Ozone	CO
Spatial scale	Neighborhood	Neighborhood
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-0539 (E. Sahara/Maycliff)

Street Address: 4001 E. Sahara Ave. City: Las Vegas
Date Established: 01/01/1990 Date Terminated: 3/31/2010
Site Latitude: +36.144444 Site Longitude: -115.085556

Originally called "Maycliff," this site was located on the east side of the valley. It monitored CO, SO_2, NO_x, PM_{10}, and $PM_{2.5}$.

Reasons for closure were excessive lease expenses and installation of the NCore site approximately 0.2 miles to the east.

Site ID: 32-003-0556 (6th Street)

Street Address: E. Sahara Ave. City: Las Vegas
Date Established: 01/01/1979 Date Terminated: 12/31/1980
Site Latitude: +36.1451 Site Longitude: -115.146383

The original East Sahara site was located near 6th Street and East Sahara Avenue, in the center of the Las Vegas Valley. It monitored CO and NO_x.

Reason for site closure was low measured results.

Site ID: 32-003-0557 (E. Charleston)

Street Address: 2850 E. Charleston Blvd. City: Las Vegas
Date Established: 04/01/1980 Date Terminated: 03/31/1997
Site Latitude: +36.158889 Site Longitude: -115.110000

This site, located in the"Five Points" area on the east side of the valley, was established as a high CO monitoring site. Originally located near 30th Street and East Charleston Boulevard (lat/long +36.159478, -115107194), the site was later moved to its current location. While CO was the primary pollutant monitored at this site, DAQEM also monitored NO_x, SO_2, and PM_{10}. DAQEM conducted many CO studies over the years, and they all provided the same results: the area of 28th Street and Charleston Boulevard consistently showed the highest levels of CO.

In 1997, the high CO site was moved to Sunrise Acres because of lease issues.

Site ID: 32-003-0558 (Paradise)

Street Address: 2500 Paradise Rd. City: Las Vegas
Date Established: 01/01/1980 Date Terminated: 12/31/1986
Site Latitude: +36.171667 Site Longitude: -115.146667

This was the original Las Vegas microscale site, located in the Sahara Hotel walkway bridge over Paradise Road. It measured only CO.

The site was closed when the Sahara decided to discontinue climate control in the maintenance room containing the monitor.

Site ID: 32-003-0559 (Channel 10)

Street Address: 4210 Channel 10 Dr. City: Las Vegas
Date Established: 01/01/1983 Date Terminated: 06/27/1987
Site Latitude: +36.118056 Site Longitude: -115.116667

This site monitored only TSP.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insufficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-0560 (Microscale)

Street Address: 2801A E. Charleston Blvd. City: Las Vegas
Date Established: 01/01/1998 Date Terminated: 06/29/2004
Site Latitude: +36.158611 Site Longitude: -115.110833

The East Charleston microscale site was located in the ”Five Points” area on the east side of the Las Vegas Valley, where it monitored CO, PM_{10}, and $PM_{2.5}$. When DAQEM relocated the Federal Reference Method monitor (FRM) to Sunrise Acres, staff disassembled the platform here and reassembled it at the Sunrise Acres site.

Reason for site closure was loss of lease.

Site ID: 32-003-0561 (Sunrise Acres)

Street Address: 2501 Sunrise Ave. City: Las Vegas
Date Established: 10/01/1996 Date Terminated:
Site Latitude: +36.163994 Site Longitude: -115.113930

This site, in the”Five Points” area, monitors CO, PM_{10}, and $PM_{2.5}$. It was originally housed in a maintenance room at the Sunrise Acres School, until a new school was built and DAQEM determined that it needed a full-scale site to house particulate monitors. DAQEM purchased a shelter and relocated the monitoring site to a place previously known as the Variety School site, which is described in a later section.

Sunrise Acres	PM_{10}	$PM_{2.5}$ Continuous	CO	$PM_{2.5}$ (FRM)	$PM_{2.5}$ FRM Collocated
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood

Monitoring objective	Population. exposure	Highest concentration	Highest concentration	Highest concentration	Highest concentration

Site ID: 32-003-0562 (Crestwood)

Street Address: 130 Pauline Way
City: Las Vegas
Date Established: 10/01/1996
Date Terminated: 02/28/2002
Site Latitude: +36.155278
Site Longitude: -115.127222

This site was established in the "Five Points" area as part of a study to pinpoint the highest CO level in the Las Vegas Valley. $PM_{2.5}$ was also monitored at this location.

Reason for closure was a Clark County School District site improvement that conflicted with 40 CFR siting criteria.

Site ID: 32-003-0563 (Freedom Park)

Street Address: 650 N. Mojave Rd.
City: Las Vegas
Date Established: 10/01/2001
Date Terminated: 04/30/2005
Site Latitude: +36.176390
Site Longitude: -115.102780

This site was established because of modeling that showed the area north of Sunrise Acres would have higher CO levels. However, this proved not to be the case; CO levels were midway between those at the Sunrise Acres and J.D. Smith sites. This site also monitored NO_x.

The site was closed after results satisfied the user requirements and disproved the model.

Site ID: 32-003-0601 (Boulder City)

Street Address: 1005 Industrial Rd.
City: Boulder City
Date Established: 01/01/1998
Date Terminated:
Site Latitude: +35.978889
Site Longitude: -114.844167

This site currently monitors O_3 and PM_{10}. Previously, it also monitored NO_x, SO_2, and $PM_{2.5}$.

Boulder City	PM_{10}	Ozone
Spatial scale	Neighborhood	Neighborhood
Monitoring objective	Population exposure	Population exposure

Site ID: 32-003-1001 (E. Bonanza)

Street Address: 280 E. Bonanza Rd.
City: Las Vegas
Date Established: 01/01/1957
Date Terminated: 03/31/1995
Site Latitude: +36.173611
Site Longitude: -115.140833

According to information retrieved from the AQS database, this is the first air monitoring site in Clark County. Its creation predates the CAA. Data from the site was collected from more than

one location, but the final reporting location was atop the roof of what used to be a Nevada Highway Patrol building. Comments in the AQS site record suggest that before this final location, instruments were housed in or on a trailer at a nearby fire station. It started as a TSP site and ended as a PM_{10} site; other pollutants measured included CO, NO_x, O_3, and sulfation rate.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insufficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-1002 (E. Bonanza 2)

Street Address: 208 E. Bonanza Rd. City: Las Vegas
Date Established: 12/05/1987 Date Terminated: 12/30/1988
Site Latitude: +36.172778 Site Longitude: -115.087500

This site, in the center of the Las Vegas Valley, monitored PM_{10} for a short time.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insufficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-1003 (Moapa)

Street Address: Indian Council Bldg., Moapa River Reservation City: Near Moapa
Date Established: 01/01/1972 Date Terminated: 12/31/1972
Site Latitude: +36.633042 Site Longitude: -114.584159

This site near Moapa sampled for TSP for a short time.

Reason for site closure was low measured results.

Site ID: 32-003-1004 (Sunrise Power)

Street Address: Sunrise Power Station, E. Vegas Valley Dr. City: Las Vegas
Date Established: 01/01/1972 Date Terminated: 12/31/1987
Site Latitude: +36.138056 Site Longitude: -115.034444

This site was located in the eastern part of the Las Vegas Valley, west of the landfill. TSP was the only pollutant measured.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insuf-

ficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-1005 (Sunset Rd 2)

Street Address: 680 Sunset Rd. City: Las Vegas
Date Established: 01/01/1972 Date Terminated: 12/31/1979
Site Latitude: +36.072772 Site Longitude: -115.148613

This site was located in the southeast part of the Las Vegas Valley, south of McCarran International Airport, and measured O_3 and TSP.

Reason for site closure is unknown.

Site ID: 32-003-1007 (McCarran)

Street Address: McCarran Int'l Airport City: Las Vegas
Date Established: 01/01/1972 Date Terminated: 12/31/1989
Site Latitude: +36.078333 Site Longitude: -115.167500

This site, provided by the state of Nevada, was primarily a TSP site from 1972 to 1976; the site ID was reused in special studies for O_3 monitoring.

The site was closed when the state completed its project and removed the shelter.

Site ID: 32-003-1008 (Old Mormon Farm)

Street Address: 5805 E. Monson City: Las Vegas
Date Established: 01/01/1972 Date Terminated: 12/31/1976
Site Latitude: +36.116383 Site Longitude: -115.047500

This address is no longer valid. It is near the site of an old Mormon farm on the east side of the valley, north of Stephanie Street and Flamingo Road. The pollutant measured was TSP.

Reason for site closure is unknown.

Site ID: 32-003-1010 (LVFD 2)

Street Address: 2801 E. Charleston Blvd. City: Las Vegas
Date Established: 07/03/1989 Date Terminated: 12/31/1993
Site Latitude: +36.156667 Site Longitude: -114.999167

This site measured TSP. See site ID 32-003-0010 for more information.

Site ID: 32-003-1011 (Sahara Hotel)

Street Address: 2500 Paradise Rd. City: Las Vegas
Date Established: 01/01/1972 Date Terminated: 12/31/1991
Site Latitude: +36.141389 Site Longitude: -115.155000

This site measured TSP using a hi-vol mounted on the roof of a maintenance building behind the Sahara Hotel.

The site was closed after the transition from TSP to PM_{10} monitoring; closure could have been the result of low measured results, insufficient infrastructure to support PM_{10} sampling, an insufficient number of PM_{10} samplers, conflicts with siting criteria, or any combination of these reasons.

Site ID: 32-003-1012 (Tropicana & Paradise)

Street Address: 481 E. Tropicana Ave. City: Las Vegas
Date Established: 01/01/1974 Date Terminated: 12/31/1978
Site Latitude: +36.100549 Site Longitude: -115.154447

This site near the corner of Tropicana Avenue and Paradise Road measured TSP.

Reason for site closure is unknown.

Site ID: 32-003-1013 (Silver Bowl)

Street Address: Russell Rd. & Broadbent City: Las Vegas
Date Established: 01/01/1974 Date Terminated: 12/31/1981
Site Latitude: +36.091667 Site Longitude: -115.026111

This site measured TSP using a hi-vol mounted on top of a building at the open end of Sam Boyd Stadium (then known as the Silver Bowl).

Reason for site closure is low measured results.

Site ID: 32-003-1019 (Jean)

Street Address: 1965 State Hwy. 161 City: Jean
Date Established: 01/01/1995 Date Terminated:
Site Latitude: +35.785634 Site Longitude: -115.357060

This site currently monitors O_3, PM_{10}, and $PM_{2.5}$. Previously, it also monitored NO_x.

Jean	PM_{10}	$PM_{2.5}$ Continuous	Ozone	$PM_{2.5}$ (FRM)
Spatial scale	Regional	Regional	Regional	Regional
Monitoring objective	Background	Background	Transport	Background

Site ID: 32-003-1021 (Orr)

Street Address: 1562 Katie Ave. City: Las Vegas
Date Established: 10/01/2002 Date Terminated: April 2010
Site Latitude: +36.120500 Site Longitude: -115.130000

This site, on the east side of the valley near the Boulevard Mall, monitors CO, O_3, and PM_{10}.

The site was closed as a result of cost-saving measures, significant shelter replacement costs, and measurements that correlated well with other sites.

Site ID: 32-003-1022 (E. Flamingo)

Street Address: 210 E. Flamingo Rd. City: Las Vegas
Date Established: 07/01/1995 Date Terminated: 09/30/2002
Site Latitude: +36.114444 Site Longitude: -115.162500

This site measured CO and PM_{10}, but was replaced with the Orr site.

Site ID: 32-003-1023 (MGM)

Street Address: 3799 S. Las Vegas Blvd. City: Las Vegas
Date Established: 10/01/1996 Date Terminated: 03/31/2007
Site Latitude: +36.101389 Site Longitude: -115.171944

This site was located in a maintenance closet under an escalator next to the MGM Grand Hotel. It was the third microscale site and monitored CO.

The site was closed after years of measuring very low pollutant levels.

Site ID: 32-003-2001 (NLV PO)

Street Address: 1301 E. Lake Mead Blvd. City: North Las Vegas
Date Established: 01/01/1972 Date Terminated: 12/31/2004
Site Latitude: +36.195000 Site Longitude: -115.123889

This site, located at the North Las Vegas Post Office, originally measured TSP. In 1985, it began monitoring PM_{10}.

The site was closed in October 1998, when the PM_{10} hi-volume samplers were moved to the J.D. Smith site.

Site ID: 32-003-2002 (J.D. Smith)

Street Address: 1301B E. Tonopah City: North Las Vegas
Date Established: 10/01/1998 Date Terminated:

Site Latitude: +36.191111 Site Longitude: -115.122222

This site, on the east side of the Las Vegas Valley, sits at the lowest elevation and monitors CO, O_3, NO_x, PM_{10}, and $PM_{2.5}$.

J.D. Smith	PM_{10}	$PM_{2.5}$ Continuous	Ozone	CO	$PM_{2.5}$ (FRM)	NO_2
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring objective	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure

Site ID: Not Entered in AQS (Kerr-McGee)

Street Address: 8000 W. Lake Mead Dr. City: Henderson
Date Established: ~1984 Date Terminated: 2/28/1994
Site Latitude: +36.043375 Site Longitude: -115.004317

This site, immediately downhill of the perchlorate processing facility, was established to measure NH_3 levels at the BMI complex. Actual startup date is uncertain, but it was operating in the mid-1980s. Data before 1990 is unavailable.

Ammonia production declined as the source made changes to its operation, rendering the site obsolete, so it was closed.

Site ID: Not Entered in AQS (Pepcon)

Street Address: Gibson Rd. & Lake Mead Dr. City: Henderson
Date Established: ~1986 Date Terminated: 05/04/1988
Site Latitude: +36.034803 Site Longitude: -115.032972

This site was established to determine ammonia levels at Pepcon's ammonium perchlorate production facility.

The site was destroyed in the Pepcon explosion on May 4, 1988. Follow-up sampling was done with a PM_{10} hi-vol to determine the effects of the explosion, but the dates of the sampling and the associated data are unavailable.

Site ID: Not Entered in AQS (Dime III)

Street Address: 3220 Gavilan Lane City: Las Vegas
Date Established: 04/01/1993 Date Terminated: 05/31/2000
Site Latitude: +36.130828 Site Longitude: -115.051964

Located in a mobile home park (Desert Inn Mobile Estates #3), this was a special monitoring site for NH_3 and H_2S. Several citizens in the area complained about odors emanating from sewage

treatment plants in the area. This site, in conjunction with the Winterwood and Landfill sites, monitored H_2S in response to those complaints.

As the wastewater treatment plants expanded their facilities and implemented better odor controls, complaints diminished and measured concentrations dropped. The need to continue monitoring diminished and then ceased as user requirements were met.

Site ID: Not Entered in AQS (Variety School)

Street Address: 2501 Sunrise Ave. City: Las Vegas
Date Established: 11/01/1993 Date Terminated: 01/31/1996
Site Latitude: +36.163994 Site Longitude: -115.113930

This site was established as part of an effort to pinpoint the highest CO levels in the East Charleston area. It is the current location of the Sunrise Acres site.

Site ID: Not Entered in AQS (Proximity Site)

Street Address: 2900 E. Charleston Blvd. City: Las Vegas
Date Established: 10/01/1993 Date Terminated: 03/31/1996
Site Latitude: +36.15986 Site Longitude: -115.10925

This site was operated to establish whether the drive-through at a neighboring fast-food restaurant was affecting readings at the East Charleston site, 100 yards to the east.

The site was operated only for study purposes and closed after the study was completed.

Site ID: Not Entered in AQS (Lake Mead)

Street Address: 1600 E. Lake Mead Blvd. City: N. Las Vegas
Date Established: 06/07/1994 Date Terminated: 09/23/1998
Site Latitude: +36.196353 Site Longitude: -115.122792

This site on Nevada Power Company property monitored PM_{10} and $PM_{2.5}$.

Nevada Power asked the air quality agency to vacate the property, and the J.D. Smith site replaced this one.

Site ID: Not Entered in AQS (Saguaro Power)

Street Address: 8000 W. Lake Mead Blvd. City: Henderson
Date Established: 01/01/1995 Date Terminated: 11/30/2000
Site Latitude: +36.042525 Site Longitude: -115.011903

This site was initiated under permit condition requirements: a large ammonia storage tank resulted in NH_3 monitoring. It was operated by a contractor until Saguaro Power Company met the

conditions of the permit for post-construction monitoring, at which point they agreed to allow Air Quality to continue operating the site.

Reasons for site closure were low measured results and lack of value in monitoring NH_3.

Site ID: Not Entered in AQS (Chris Crane)

Street Address: ~9100 S. Jones
City: Las Vegas
Date Established: 1996
Date Terminated: 1997
Site Latitude: +36.024231
Site Longitude: -115.225703

This site in a warehouse at the Chris Crane Company measured PM_{10}. It was initiated because of complaints of excessive dust from the facility.

The site was closed after the source demonstrated control of its dust emissions.

Site ID: Not Entered in AQS (Victory Road)

Street Address: Buchanan Ave. & Victory Rd.
City: Henderson
Date Established: 07/03/1997
Date Terminated: 03/31/2002
Site Latitude: +36.029978
Site Longitude: -114.995806

This site was established to address citizen concerns following a chlorine leak from Timet. A chlorine monitor was installed in a closet off the snack bar at the ball fields.

Reason for site closure was low measured results.

Site ID: Not Entered in AQS (Landfill)

Street Address: Sunrise Landfill
City: Las Vegas
Date Established: 05/04/1998
Date Terminated: 12/31/2005
Site Latitude: +36.136175
Site Longitude: -115.009733

This site monitored H_2S and SO_2. It was set up to monitor the closing of the Sunrise Landfill and nearby wastewater treatment facilities.

Reasons for site closure were improved wastewater treatment plant controls and low measured concentrations.

Site ID: Not Entered in AQS (Wet 'N' Wild)

Street Address: 2601 S. Las Vegas Blvd.
City: Las Vegas
Date Established: 11/24/1998
Date Terminated: 03/31/1999
Site Latitude: +36.142194
Site Longitude: -115.156817

This site was part of a special CO study along the I-15/Strip corridor. This site was closed at the conclusion of the study.

Site ID: Not Entered in AQS (Spring Mountain Road)

Street Address: W. Spring Mtn. Rd. & Aldebaran Ave. City: Las Vegas
Date Established: 11/24/1998 Date Terminated: 03/31/1999
Site Latitude: +36.129436 Site Longitude: -115.182106

This site was part of a special CO study along the I-15/Strip corridor. This site was closed at the conclusion of the study.

4.0 HISTORY OF NETWORK STUDIES

In the last 10 years, DAQEM has conducted numerous studies, research projects, and investigations relative to pollutant levels and the monitoring network. Three O_3 studies, one CO study, and one PM study provide recommendations that relate to changes in the monitoring network. This section lists these five works and their monitoring network-related recommendations.

4.1 *CLARK COUNTY REGIONAL OZONE & PRECURSOR STUDY* (MARCH 2006)[2]

CCROPS collected data needed to characterize and understand tropospheric ozone in Clark County.

4.1.1 Network Recommendations

Shut down:

- City Center—not representative because of NO_2 titration.

Additional monitoring:

- Permanent site at Paiute and Indian Springs—peak O_3; define extent of high ozone.
- Sites in the northwest foothills and Craig Ranch area—urban ozone plume extends well into these areas.
- Sites at Black Mountain and Lower Potosi—determine importance of ozone aloft at night and early morning.

4.2 *SOUTHWEST DESERT/LAS VEGAS OZONE TRANSPORT STUDY* (JULY 2008)[3]

SLOTS studied the mechanisms and impact of pollutant transport into southern Nevada through enhanced monitoring of ozone air quality and meteorology at key locations during the 2007 ozone season (May 1-Sept. 30).

4.2.1 Network Recommendations

Additional monitoring:

- Key locations in the Mojave Desert along identified transport paths to further characterize the transport mechanism(s).

[2] T&B Systems (2006). *Clark County Regional Ozone & Precursor Study*. Retrieved January 14, 2010, from http://www.accessclarkcounty.com/depts/daqem/aq/planning/Documents/Ozone/CCROPS_Report.pdf.

[3] T&B Systems (2006). *Southwest Desert/Las Vegas Ozone Transport Study*. Retrieved January 14, 2010, from http://www.accessclarkcounty.com/depts/daqem/aq/planning/Documents/Ozone/SLOTSfinalrpt_July08.pdf.

4.3 *OZONE CHARACTERIZATION STUDY* (JANUARY 2006)[4]

This study characterized ozone, its precursors, and transport during high-ozone events.

4.3.1 Network Recommendations

Additional monitoring:

- Sites in the extreme northwest and northeast of the valley and along the western foothills—determine if the existing ozone network adequately characterizes peak levels.
- Upper air measurements at at least one site in the valley and one upwind location—boundary layer measurements of temperature, winds, and stability.
- Sites at elevated platforms of opportunity (e.g., isolated hill tops or tall towers)—determine the importance of ozone aloft at night and early morning.

4.4 *CARBON MONOXIDE SATURATION STUDY* (APRIL 2002)[5]

The CMSS is a detailed assessment of CO concentrations in the Las Vegas Valley conducted by Technical and Business Systems, Inc.

4.4.1 Network Recommendations

Additional monitoring:

- Possible sites near Boulder Highway, south of Nellis, and northwest of the I-15/U.S. 95 interchange—effects of rapidly increasing population.

4.5 *PM_{10} SATURATION STUDY* (FEBRUARY 2007)[6]

This field study helped DAQEM understand the spatial distribution of PM_{10} and assess how well the existing monitoring network could measure impacts.

4.5.1 Network Recommendations

Shut down:

- Possibly relocate Paul Meyer, Palo Verde, and Walter Johnson sites to the south or newly developed areas—low values, but useful as historical data.

Additional monitoring:

- Sites in the extreme south and southwest—Jean lake plume and growth.

[4] T&B Systems (2006). *Ozone Characterization Study*. Retrieved January 14, 2010, from http://www.accessclarkcounty.com/depts/daqem/aq/planning/Documents/Ozone/OzoneCharStudy.pdf.
[5] T&B Systems (2002). *Carbon Monoxide Saturation Study*. Retrieved January 14, 2010, from http://www.accessclarkcounty.com/depts/daqem/aq/planning/Documents/CO/COSatStudy.pdf.
[6] T&B Systems (2007). *Particulate Matter (PM_{10}) Saturation Monitoring Study*. Retrieved January 14, 2010, from http://www.accessclarkcounty.com/depts/daqem/aq/planning/Documents/PM/PM10_SaturationStudy.pdf.

5.0 HISTORY OF DATA END USERS

5.1 IDENTIFY USERS AND USER GROUPS

The following resources were used to identify users and user groups:

- Review of internal records to locate individuals or organizations that have requested monitoring data.
- Direct inquiry to local agency charged with monitoring public health (SNHD).
- Direct inquiry to University of Nevada, Las Vegas (UNLV).
- Direct contact with health-based organizations that have published reports using Clark County monitoring data.
- Direct inquiry to internal groups that use monitoring data.

The results identified the following users:

- SNHD, which uses both continuous PM_{10} and continuous $PM_{2.5}$ data.
- American Lung Association (ALA), which uses O_3 data.
- DAQEM modeling and emissions inventory group, which uses O_3, NO_2, and PM data.

5.2 USER PURPOSES

- SNHD correlates pollutant levels with epidemiological factors, such as distance from high measuring sites and emergency medical system pickups.
- ALA correlates number of high-O_3 days to the quality of lung health in Las Vegas and reports the number in its annual *State of the Air* report.
- O_3 and NO_2 provide truthing for air quality modeling runs.

5.3 REPORTING SOURCES

Users obtain their data from different sources:

- SNHD obtains it from DAQEM's Web site and the Air Quality Index.
- ALA obtains it from AQS.
- Internal users obtain data from the network server and AQS.

5.4 DATA REQUESTS

Data users were asked the following questions:

- Is available data sufficient?
- If possible, what other data or location(s) would be useful?
- Would proposed site closures impact their end user needs?

Users agreed that existing data is sufficient. No additional requests were presented.

6.0 CLIMATOLOGICAL AND TOPOGRAPHICAL INFORMATION

The information in this section was taken from the National Weather Service's Las Vegas climate book.

6.1 TOPOGRAPHY AND HISTORY

Las Vegas is located in a broad desert valley in southern Nevada. Mountains surrounding the valley extend 2,000 to 10,000 feet above the valley floor. The Las Vegas Valley comprises about 600 square miles and runs from northwest to southeast. It is bounded on the north by the Sheep Range, while Boulder City and the Lake Mead National Recreation Area are generally considered its southern extent. To the west are the Spring Mountains, which include Mt. Charleston, the region's highest peak at 11,918 feet. Several smaller ranges line the eastern rim of the valley, including the Muddy Mountains, the Black Mountains, and the Eldorado Range. For most of the Las Vegas metropolitan area, the valley floor slopes downward from west to east. This affects local climatology by driving variations in wind, precipitation, and storm runoff.

Official weather observations have been recorded in Las Vegas since 1937, initially at Nellis Field in the northeast part of the valley. In late 1948, the U.S. Weather Bureau moved to McCarran Field (now McCarran International Airport), seven miles south of downtown Las Vegas.

6.2 GENERAL CLIMATIC SUMMARY

The four seasons are well defined in Las Vegas, although they differ from the traditional view of seasonal variation. Summers display classic desert Southwest characteristics: daily high temperatures typically exceed 100°F, with lows in the 70s. The summer heat is tempered somewhat by the extremely low relative humidity; however, humidity can increase markedly for several weeks each summer in association with a moist monsoonal flow from the south, typically during July and August. These moist winds support the development of spectacular desert thunderstorms associated with significant flash flooding and/or strong downburst winds.

Winters, overall, are mild and pleasant with high pressure dominating. Early morning and late night subsidence inversion are common. Afternoon temperatures average near 60° and skies are mostly clear. Pacific storms occasionally produce rainfall in Las Vegas, but in general, the Sierra Nevada Mountains of eastern California and the Spring Mountains immediately west of the Las Vegas Valley act as effective barriers to moisture.

Snow accumulation is rare in Las Vegas. Flurries are observed once or twice during most winters, but snowfall of an inch or more occurs only once every four to five years. However, freezing temperatures occur regularly each year: the valley has a 30-year average of 24 days with low temperatures at or below 32°F. Snowfall is common in the mountains surrounding Las Vegas, with the Spring Mountains receiving between 5 and 10 feet annually. The spring and fall seasons are generally considered ideal. Although sharp temperature changes can occur, outdoor activities are seldom hampered.

Strong winds are the most persistent weather hazard in the area. Winds over 50 mph are infrequent, but can occur with vigorous storms. Winter and spring wind events often generate widespread areas of blowing dust and sand. Strong wind episodes in the summertime are usually connected with thunderstorms, and are thus isolated and localized. Prevailing wind direction is typically either southwest or north unless associated with a thunderstorm outflow.

Regional transport and local influences produce higher ozone concentrations on the west and northwest sides of the valley. Ozone episodes in the Las Vegas Valley are generally characterized by a surface (thermal) low pressure system extending over Arizona, southern California, and Nevada; ridging of 500 millibars over the southwest or central United States; and southwesterly surface flow during the afternoon hours, accompanied by ample sunshine and high temperatures. Superimposed on the synoptic-scale meteorological conditions are the local, terrain-induced mesoscale meteorological features. Together, these determine the horizontal and vertical advection and dispersion of pollutants and their eventual removal from the Las Vegas Valley.

6.3 SYNOPTIC METEOROLOGY

Based on a National Meteorological Center modeling analysis at 500 millibars, a broad, flat ridge of pressure over the central United States is dominant during the summer season. Winds at this level, as indicated by the Mercury/Desert Rock Weather Service Meteorological Observatory radiosonde, are normally westerly and characterized by moderate (10-15 meters per second) wind speeds. The center's surface analyses indicate that southern Nevada is enveloped by a thermal low-pressure system.

7.0 POPULATION

More than 95 percent of Clark County's population resides in the Las Vegas Valley (Hydrographic Area 212), which encompasses the cities of Las Vegas, North Las Vegas, and Henderson, along with portions of Boulder City. Communities outside the valley have experienced significant growth in the last 20 years, including Mesquite, located on the county's northeastern edge, and Laughlin, located on the Colorado River at the county's southern end.

In the 1990s and 2000s, the Las Vegas Valley emerged as one of the fastest growing metropolitan areas in the nation. The population expanded from about 400,000 in 1980 to an estimated 1.8 million in 2005. In addition, Las Vegas attracts more visitors annually than any other American city except Orlando, Florida. Table 1 provides data on population growth in Clark County from 1990 to 2009.

Table 1. Clark County Population History (1990-2009)

Year	Population	Annual Pop. Change	Annual Increase
1990	770,280	—	—
1991	835,080	64,800	8%
1992	873,730	38,650	5%
1993	916,837	43,107	5%
1994	990,564	73,727	8%
1995	1,055,435	64,871	7%
1996	1,119,052	63,617	6%
1997	1,193,388	74,336	7%
1998	1,261,150	67,762	6%
1999	1,327,145	65,995	5%
2000	1,394,440	67,295	5%
2001	1,485,855	91,415	7%
2002	1,549,657	63,802	4%
2003	1,620,748	71,091	5%
2004	1,715,337	94,589	6%
2005	1,815,700	100,363	6%
2006	1,912,654	96,954	5%
2007	1,996,542	83,888	4%
2008	1,986,146	-10,396	-1%
2009	2,006,347	20,201	1%

Source: Center for Business and Economic Research, UNLV.

8.0 SUMMARY OF MONITORING REQUIREMENTS

40 CFR 58 dictates requirements for maintaining ambient air monitoring networks. The following requirements have been considered in this assessment of network design.

1. Determine the highest NAAQS concentration area in the network.

The results presented below are based on primary NAAQS standards applied to 2009 data.

- The area of highest CO concentration is the Sunrise Acres station at 2501 Sunrise Ave.
- The areas of highest O_3 concentration are the Joe Neal station at 6651 W. Azure Way and the Walter Johnson station at 7701 Ducharme Ave.
- The area of highest PM_{10} concentration is the Apex station at 12101 U.S. Highway 93.
- The area of highest annual average $PM_{2.5}$ concentration is the Sunrise Acres station at 2501 Sunrise Ave.
- The area of highest annual average NO_2 concentration is the J.D. Smith station at 1301b E. Tonopah Dr.

2. Compare pollutant design values for 2009 with the NAAQS.

Table 2. Comparison of Annual Ozone Design Values with NAAQS

Station	Ozone Design Value (ppm)	NAAQS Standard (ppm)
E. Craig Road	0.072	0.075
Winterwood	0.072	0.075
Apex	0.074	0.075
Lone Mountain	0.076	0.075
Palo Verde	0.075	0.075
Jean	0.076	0.075
Paul Meyer	0.077	0.075
Boulder City	0.072	0.075
J.D. Smith	0.073	0.075
Walter Johnson	0.078	0.075
Joe Neal	0.078	0.075
Mesquite	0.065	0.075
Orr	0.074	0.075

Note: ppm = parts per million.

Table 3. Comparison of Annual $PM_{2.5}$ Design Values with NAAQS

Station	$PM_{2.5}$ Design Value ($\mu g/m^3$)	NAAQS Standard ($\mu g/m^3$)
Sunrise Acres	9.4	15
Jean	4.1	15
J.D. Smith	8.5	15

Table 4. Comparison of 24-hour $PM_{2.5}$ Design Values with NAAQS

Station	$PM_{2.5}$ Design Value (μg/m³)	NAAQS Standard (μg/m³)
Sunrise Acres	21	35
Jean	11	35
J.D. Smith	18	35

Note: μg/m³ = micrograms per cubic meter.

3. Determine representative concentrations in areas of high population density.

Presented below is an average of hourly pollutant data in 2009. The methodology varies from the NAAQS to summarize actual pollutant concentrations observed in a demographic area.

- City of Las Vegas:
  - Annual mean CO concentration of 0.6 parts per million (ppm).
  - Annual mean O_3 concentration of 0.031 ppm.
  - Annual mean PM_{10} concentration of 21.9 μg/m^3.
  - Average mean $PM_{2.5}$ concentration of 8.64 μg/m^3.
  - Annual mean NO_2 concentration of 0.011 ppm.
- City of Henderson:
  - Annual mean PM_{10} concentration of 19.86 μg/m^3.
  - Average mean $PM_{2.5}$ concentration of 6.65 μg/m^3.
- City of Boulder City:
  - Annual mean O_3 concentration of 0.045 ppm.
  - Annual mean PM_{10} concentration of 14.55 μg/m^3.
- City of Mesquite:
  - Annual mean O_3 concentration of 0.028 ppm.
  - Annual mean PM_{10} concentration of 20.45 μg/m^3.

4. Determine impacts of significant sources on air quality.

- CO sources: vehicle and non-vehicle combustion sources:
  - Impact: zero exceedance days.
- NO_2 sources: vehicle and non-vehicle combustion sources:
  - Impact: zero exceedance days.
- $PM_{2.5}$ sources: vehicle and non-vehicle combustion sources, fugitive dust:
  - Impact: zero exceedance days.
- PM_{10} sources: fugitive dust, industrial processes, vacant lands, road dust, and construction activities:
  - Impact: One exceedance day in 2009, under evaluation as an exceptional event.

5. Determine background concentration levels.

The results below are based on 2009 data from the Jean monitoring site.

- PM_{10}: average of 12.37 $\mu g/m^3$.
- $PM_{2.5}$: average of 4.85 $\mu g/m^3$.
- O_3: average of 0.041 ppm.

6. Determine extent of regional ozone transport.

Studies show that regional transport has a significant impact on Clark County, which may result in ozone exceedances. Smoke from wildfires contributes significantly to ozone and particulate matter concentrations in Clark County.

7. Determine welfare-related impacts in rural and remote areas.

- Monitoring at Jean serves a rural area, provides background levels, and can be used to indicate transport from California.
- Monitoring at Boulder City serves a rural population.
- Monitoring at Mesquite serves a remote population, and the monitoring site is located at an outflow transport corridor adjacent to a jurisdictional boundary.

8.1 CLARK COUNTY AIR MONITORING NETWORK

The table below shows that the network meets or exceeds the minimum monitoring requirements in 40 CFR 58.

Table 5. Number of Monitors by Pollutant

Pollutant	Monitors Required	Monitors in service in 2008
CO	0	5
O_3	2	13
SO_2	0	0
NO_2	0	2
PM_{10} BAM	4-8	13
$PM_{2.5}$ BAM	0	6
$PM_{2.5}$ FRM	2 + collocation	3 + collocation

DAQEM uses the following criteria to evaluate the placement and function of the network to meet the requirements of 40 CFR 58:

- Monitoring objectives

- AQS scale of representation
- Emission densities
- Dispersion modeling
- Special studies
- Revised monitoring strategies
- Sampling schedules
- Local population.

9.0 NETWORK ASSESSMENT TOOLS

9.1 BACKGROUND INFORMATION

The EPA guidance document "Network Assessment Analyses and Tools Documentation" was used to develop the analyses used for this assessment. However, DAQEM found these tools to have the following limitations:

- Topography, emissions, and meteorology are not taken into consideration in any of the tools.
- Most of the data is static, i.e., the data cannot be adjusted nor can new data be input to the tools.
- Pollutants covered by the tools analyses are limited to O_3, PM_{10}, and $PM_{2.5}$.
- Monitoring data within the tools only cover from 2005 to 2008. The data included in those years must also have met certain criteria (e.g., 75 percent completion).
- The data collected by the U.S. Census Bureau is only fully updated at each decennial census.

9.2 AREA SERVED TOOL

The "Area Served Tool" is a mathematical method to analyze what population is served by each monitor. This is the one tool where new sites can be added. Existing and/or proposed sites are input, and the tool develops and displays polygons based on evenly distributed areas. The population data used in this analysis is from the 2000 census.

9.3 CORRELATION MATRIX TOOL

The "Correlation Matrix Tool" shows the correlation, relative difference, and distance between pairs of sites. Polygon graphs can be generated for each pollutant for each year of analysis. The more elliptical the generated polygon, the more correlation there is between monitors based on distance and pollutant being analyzed. This tool can be used to show monitoring site redundancy, but it cannot be used to determine areas that might be missed by the monitoring network.

The tool has input options for only two parameters: pollutant and year.

The options for pollutant are O_3, PM_{10}, continuous $PM_{2.5}$, 3-day $PM_{2.5}$ FRM, and 6-day $PM_{2.5}$ FRM. Individual years from 2005 to 2008, or a combination of these years, can be input to the tool.

Attempts to correlate $PM_{2.5}$ monitors resulted in "NA" for the Apex, Jean, and Sunrise Acres sites. This was likely caused by insufficient Clark County (in-state) monitors to correlate.

EPA has performed the correlation analyses for the Core-Based Statistical Area containing Las Vegas for all of the pollutants mentioned above. These EPA analyses included individual years and three-year periods.

9.4 NEW SITES TOOL

The "New Sites Tool" shows potential locations for new sites, i.e., where a new monitoring site may be needed. This tool uses the 2008 monitoring network, and allows the user to change the following four criteria:

- Correlation between site pairs (default = 0.5).
- Minimum distance between site pairs (default = 100 kilometers).
- Average gradient between site pairs (default = 0).
- Probability of design value exceeding 85 percent of NAAQS (default = 80).

Graphs were produced for each of the three pollutants using default values for all four of these criteria. The graphs outline new site locations for the entire United States.

9.5 REMOVAL BIAS TOOL

The "Removal Bias Tool" estimates pollutant concentration at the site's location if the site did not exist. The tool allows for one or more sites to be removed. Each pollutant must be analyzed separately.

$PM_{2.5}$ FRM was not considered in this analysis.

9.6 RESULTS

9.6.1 Ozone Correlation

Table 6. Ozone Correlation

Sites	CR	AP	MQ	PM	WJ	LM	PV	JO	BC	JN	JD
CR	1.00	0.68	0.47	0.65	0.73	0.75	0.62	0.70	0.58	0.55	0.77
AP	0.68	1.00	0.68	0.58	0.62	0.63	0.53	0.54	0.80	0.64	0.71
MQ	0.47	0.68	1.00	0.43	0.46	0.45	0.42	0.38	0.70	0.54	0.52
PM	0.65	0.58	0.43	1.00	0.88	0.82	0.79	0.68	0.54	0.67	0.74
WJ	0.73	0.62	0.46	0.88	1.00	0.94	0.88	0.78	0.57	0.65	0.82
LM	0.75	0.63	0.45	0.82	0.94	1.00	0.86	0.82	0.55	0.64	0.80
PV	0.62	0.53	0.42	0.79	0.88	0.86	1.00	0.70	0.49	0.62	0.71
JO	0.70	0.54	0.38	0.68	0.78	0.82	0.70	1.00	0.46	0.54	0.69
BC	0.58	0.80	0.70	0.54	0.57	0.55	0.49	0.46	1.00	0.65	0.65
JN	0.55	0.64	0.54	0.67	0.65	0.64	0.62	0.54	0.65	1.00	0.62
JD	0.77	0.71	0.52	0.74	0.82	0.80	0.71	0.69	0.65	0.62	1.00

Note: The Orr site was not used for run years.

Table 7. Analysis

Site	Removal Bias	Non-County	Spatial	Design Value	Population Served	Square Miles	Population Served (square miles)
CR	-0.001	0 of 5	Y	100%	119,000	113	1053
AP	-0.001	2 of 7	Y	103%	10,000	3121	3
MQ	0.006	5 of 10	Y	89%	16,000	944	16
PM	-0.001	1 of 6	Y	108%	196,000	62	3172
WJ	0.000	0 of 5	LM PV	109%	195,000	22	8855
LM	0.000	0 of 4	WJ JO	108%	131,000	22	5845
PV	0.001	2 of 7	WJ LO	105%	66,000	883	74
JO	-0.003	2 of 9	Y	108%	88,000	50	1772
BC	0.000	6 of 13	Y	97%	101,200	339	229
JN	-0.001	2 of 6	Y	104%	5,000	603	9
JD	0.004	0 of 6	SA	101%	334,000	83	4039
ORR	-0.002	0 of 5	Y	NA	589,000	120	4928

9.6.2 Removal Bias Tool Results

A positive average bias would mean that if the site being examined were removed, the neighboring sites would indicate a higher estimated concentration than the measured concentration. Likewise, a negative average bias would suggest a lower estimated concentration at the location than the actual measured concentration.

Statistically insignificant sites are shown as solid dots, while other sites were color coded according to the magnitude of their average bias and displayed as rings.

While running the Removal Bias Tool, each site was run individually to reduce the number of non-county sites used in the calculations. The bias would be different if more than one site were selected for removal at a time.

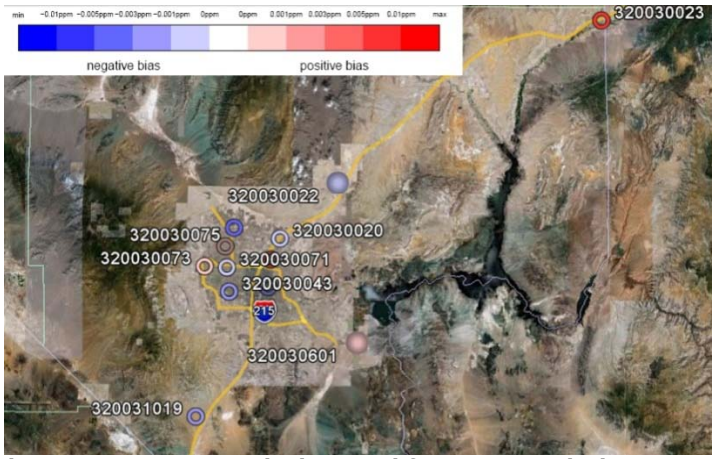


Figure 1. Removal Bias Tool for Ozone: Clark County.

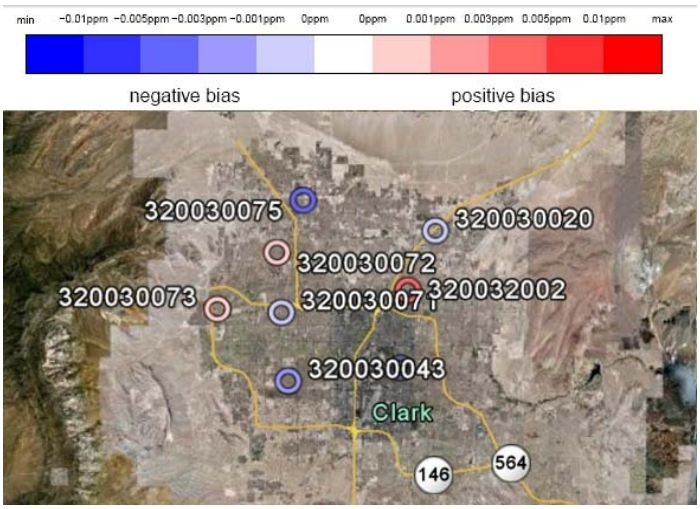


Figure 2. Removal Bias Tool for Ozone: Las Vegas Valley.

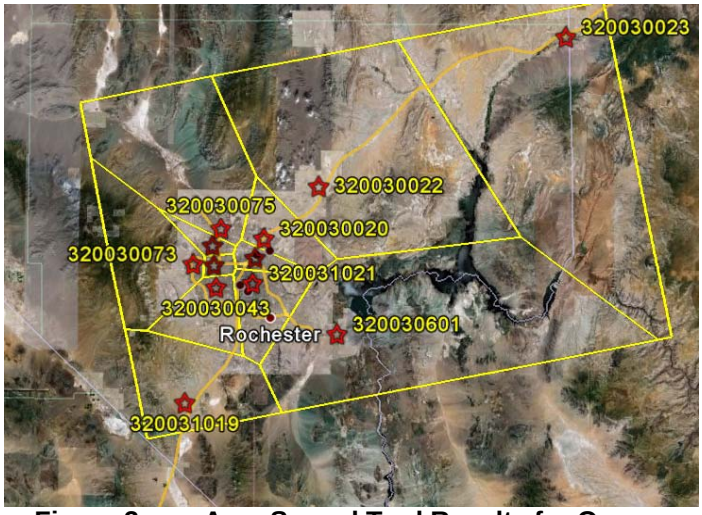


Figure 3. Area Served Tool Results for Ozone.

Figure 4. New Site Tool Results for Ozone.

9.6.3 $PM_{2.5}$ Correlation

Table 8. $PM_{2.5}$ Correlation

	CR	GV	JD
CR	1.00	0.43	0.40
AP	NA	NA	NA
GV	0.40	0.49	1.00
SA	NA	NA	NA
JN	NA	NA	NA
JD	0.40	0.49	1.00

Table 9. Analysis

Site	Removal Bias	Non-County	Spatial	Design Value	Population Served	Square Miles	Population Served (square miles)
CR	0.6	8 of 13	Y	59%	159,000	139	1143
AP	2.9	20 of 23	Y	NA	NA		
GV	3.1	13 of 17	Y	41%	410,000	432	949
SA	-0.9	5 of 10	JD	74%	662,000	199	3327
JN	2.5	12 of 16	Y	67%	382	7	53
JD	0.4	5 of 8	SA	NA	586,000	230	2553

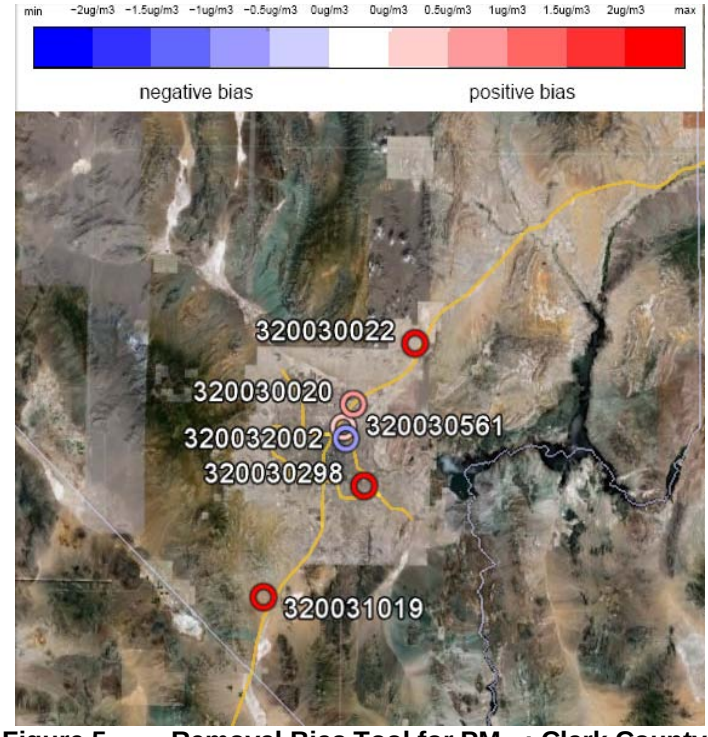


Figure 5. Removal Bias Tool for $PM_{2.5}$: Clark County.

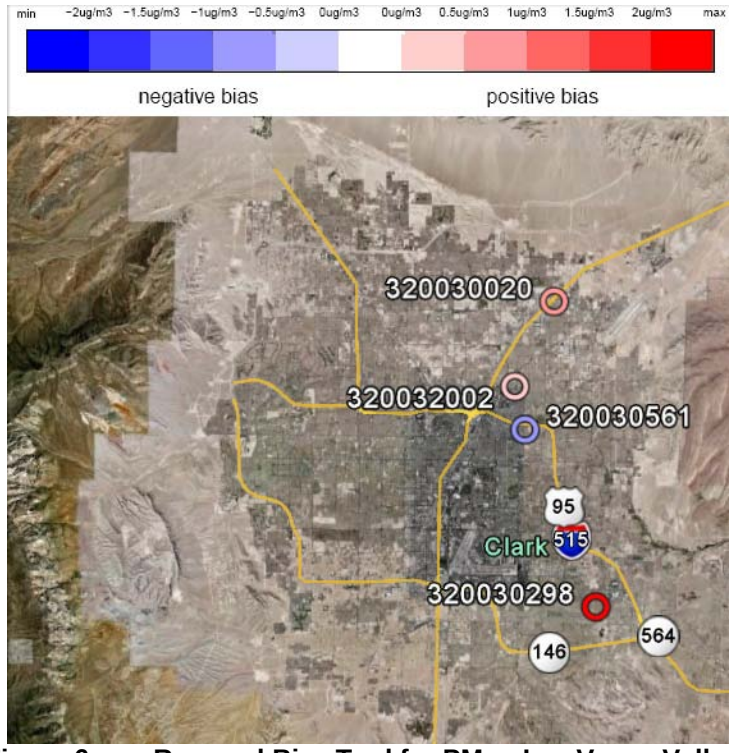


Figure 6. Removal Bias Tool for $PM_{2.5}$: Las Vegas Valley.

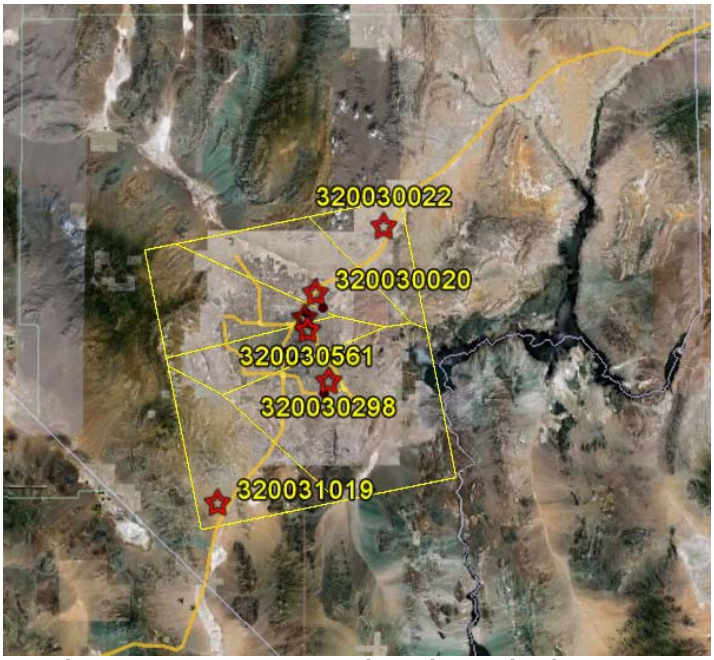


Figure 7. Area Served Tool Results for $PM_{2.5}$.

Figure 8. New Site Tool Results for $PM_{2.5}$.

9.6.4 PM_{10} U.S. Environmental Protection Agency Run Information

Table 10. EPA Run PM_{10} Summary Site Value

Site	Spatial Design	Value	Population Served
CR	Y	105%	116,000
AP	Y	NA	10,000
MQ	Y	95%	16,000
PM	Y	51%	246,000
LM	JO	NA	216,000
PV	Y	36%	97,000
JO	LM	63%	94,000
GV	Y	71%	349,000
SA	JD	75%	227,000
BC	Y	45%	NA
JN	Y	44%	5,000
ORR	Y	51%	260,000
JD	SA	73%	214,000

9.7 CONCLUSIONS

Based on the EPA tool results, there are redundant monitors in the network and more monitors could be added.

9.7.1 Redundant Monitors

Based on a correlation result threshold of 0.9 or greater, the Walter Johnson and Lone Mountain O_3 monitors are redundant. Based on equal zero bias results and essentially the same area-served results, one of these monitors should be closed.

9.7.2 Areas to Consider for New Sites

Based on the tools, the Clark County network could benefit from new monitors in the following locations:

- O_3
  - Two sites in California: one in Death Valley and one at the border along the I-15 corridor.
  - One site in the Pahrump Valley.
  - One site in the mountain range west of the Las Vegas Valley.
- $PM_{2.5}$
  - Two sites along the I-15 corridor: one at the southern entrance to the valley and one site at the northeastern entrance.
  - One site in Sunrise Manor, on the mountain range east of the valley.

10.0 SITUATIONAL ANALYSIS

10.1 SHELTER SERVICEABILITY ISSUES

Most of the currently operating sites in the network are at least ten years old, and one dates all the way back to 1979. Eight (half) of the operating sites were set up with Tuff Sheds (a well-built type of garden and tool shed) or old trailers as shelters. Table 11 lists these sites.

Table 11. Shelter Type

Site Name	Address	Type
Boulder City	1005 Industrial Rd.	Pitched roof TUFF SHED™
Craig Road	4701 Mitchell St.	Pitched roof TUFF SHED™
East Sahara	4001 Sahara Ave.	Trailer
Green Valley	248 Arroyo Grande	Pitched roof TUFF SHED™
Lone Mountain	3525 N. Valadez St.	Pitched roof TUFF SHED™
Orr	1562 E. Katie Ave. Suite D	Pitched roof TUFF SHED™
Paul Meyer	4525 New Forest Dr.	Pitched roof TUFF SHED™
Walter Johnson	7701 Ducharme Ave.	Pitched roof TUFF SHED™

All eight shelters are in need of significant repair, refurbishment, or replacement. The most cost-effective approach is shelter replacement; however, because of the economic down-turn, funding for all capital expenditures has been eliminated.

Of the sites above, Walter Johnson remains adequate for use in the O_3 monitoring network. The site will not accommodate PM monitoring or meteorological sampling.

10.2 SAFETY ISSUES

Unsurprisingly, sites installed years ago do not meet the safety codes of today. This becomes an issue when evidence emerges of safety risks. Table 12 lists the sites with safety and code issues.

Table 12. Existing Safety Issues

Site Name	Address	Toe Kick	Other
Apex	12101 U.S. Hwy 93	Needs	Unstable soil/dust.
Boulder City	1005 Industrial Rd.	Needs	Floor inside shelter missing/damaged. Countertop inside shelter needs to be replaced.
Craig Road	4701 Mitchell St.	Needs	
Lone Mountain	3525 N. Valadez St.	Needs	Protruding bolts at ankle level. Missing floor tiles within shelter.
Paul Meyer	4525 New Forest Dr.	Needs	Water pooling on concrete pad, creating possible electrocution hazard. Flooring damaged. Barbed wire around shelter fence unsecured and out of place.
Walter Johnson	7701 Ducharme Ave.		Interior floor damaged. Barbed wire around shelter fence unsecured and out of place. Fence post at NE corner bent, causing site security issue.
Winterwood	5483 Club House Dr.		Bollards needed.

As noted above, funding for all capital expenditures has been eliminated because of budgetary concerns. Although some funds are kept in reserve to address safety issues, the available funds are insufficient to address all issues at this time.

10.3 BUDGET

10.3.1 Administrative Budget

Administrative costs are the personnel costs associated with administering a monitoring operation. These costs are generally fixed, increasing slowly over time, and are not scalable: that is to say, the costs are the same whether operating with one monitoring site or a large number of sites. These costs include, but are not limited to, management, clerical support, dedicated employees, quality assurance officer, standards person, data person, lab person—and dedicated equipment, including vehicles. These costs were approximately $712,000 in 2009, with an annual growth rate of at least 4 percent.

10.3.2 Overhead Budget

Overhead costs are the fixed costs associated with having a monitoring operation. These costs do not generally change over time and are not scalable: that is to say, the costs are the same whether operating with one site or a large number of sites. These costs include, but are not limited to, a centralized operating facility, utilities (e.g., water, sewage, power, phone), facility maintenance, and infrastructure costs (e.g., support from groups such as Information Technology, Human Resources, Purchasing, and Legal). For the monitoring section of DAQEM, these costs are approximately $356,000 per year.

10.3.3 Operational Overhead Budget

Operational overhead costs tend to be fixed costs associated with operating a monitoring network. These costs are generally steady but may change over time, so they are generally scalable in some type of step function: that is to say, the costs change for every new station, for every five stations, for every monitor, or in some other predictable pattern. These costs include, but are not limited to, nongas cylinder standards (e.g., primary standards, transfer standards, certifications and calibrations), site maintenance, warehouse space, consumables, vehicles, and specialty tool replacement. DAQEM's overhead monitoring costs include the following:

- $16,000 per year for standards.
- $12,000 per year for site maintenance (every 15 sites).
- $2,500 per year for warehouse space (each site over 20 sites).
- $13,000 per year for consumables (every 50 instruments).
- $45,000 for vehicles (every 5 sites and every 5 years).
- $500 for specialty tool replacement (e.g., pool use cordless tools, drill bits, blades, etc.).

For the current network, the annual operational overhead is approximately $86,000.

10.3.4 Operating Field Labor and Appurtenants Budget

One technician is required for every five monitoring sites in the Las Vegas Valley. An additional technician is required for every three or four sites outside the valley, depending on travel time: if the driving time is between one and two hours, one technician per four sites is required; if the driving time exceeds two hours, one technician per three sites is required. Every technician requires routine and single-purchase budget items, such as $500 for tools (one-time purchase), $300 for safety equipment (each year), and expenses for cell phones and fuel. The approximate expense to hire and train a new technician is $140,000.

Approximate costs for the 2009 field operation, with 17 sites (3 outside the valley), were $626,000. This labor budget is projected to grow at 7 percent annually.

10.3.5 Operating Budget per Analyzer, Monitor, and Sampler

Operating costs for instruments that contribute to the collection of ambient pollutant data include the instrument (as a prorated replacement expense), support instruments (also prorated), gas cylinders, filters, maintenance parts (e.g., seals, gaskets, lamps, etc.), and common failure components (e.g., boards, encoders, etc.). The estimated budget is based on averaging the following historical costs over the number of instruments operating in the network:

- Each ozone analyzer costs approximately $4,500 per year.
- Each NO analyzer costs approximately $6,500 per year.
- Each manual PM analyzer costs approximately $18,500 per year.
- Each beta gauge PM analyzer costs approximately $1,700 per year.
- Each meteorological tower costs approximately $400 per year.

10.3.6 Pollutant Forecasting Budget

Pollutant forecasting capability has proved invaluable with respect to anticipating NAAQS exceedance events and maintaining SIP compliance. The resources to perform this service include, but are not limited to, a dedicated staff meteorologist with appurtenant equipment and vehicle, a satellite uplink system, upper atmosphere measurement equipment, and relevant boundary layer meteorological measurements. The approximate annual budget for this service is approximately $212,500.

10.3.7 Site Lease Budget

DAQEM has been fortunate with respect to site lease expenses: most sites are located on school properties, and have no lease costs. When we have had to pay lease or rental fees, they have been on the order of $100 per month ($1,200 per year). For one site, East Sahara, we pay a variable-

rate rent of approximately $250 to $750 per month. DAQEM's lease expenses for calendar year 2009 were approximately $7,200.

10.3.8 Site Stand-Up Budget

The process to stand up a new monitoring site is governed by state statute; building, fire, and county codes; and county standards. It involves a team of real estate and legal professionals to obtain a site agreement, an architect to design the site improvements, and a contractor to improve the site. All DAQEM sites are temporary, mobile monitoring shelters. However, because building codes do not allow a temporary power connection, these mobile sites are treated as permanent facilities. The resulting cost to stand up a new monitoring site, assuming no customization work is required from the architect, is approximately $450,000 per site.

10.3.9 Site Demobilization Budget

When demobilizing a site, DAQEM is required to remove all improvements (e.g., fence, slab, utility connections, etc.) and return the site to a condition consistent with adjacent use. The estimated budget for this is approximately $25,000.

11.0 PRIORITY RANKING OF SITES

Sites were ranked by priority in considering closures to meet budget constraints. Section 11.1 describes the ranking methodology, and Table 13 lists the sites recommended for closure.

Table 13. Site Operation Reductions

Site to be Closed	Proposed Special Purpose Monitoring
Craig Road	Summer ozone (May – August)
Mesquite	Summer ozone (May – August)
Orr	---
Apex	Summer ozone (May – August)
East Sahara	---
Lone Mountain	---

11.1 METHODOLOGY

The methodology for this process required a policy decision based on input from three focused technical discussions: (1) monitoring criteria, (2) planning needs, and (3) modeling needs. The most challenging of these discussions was the one on monitoring criteria.

Issues that complicated the monitoring criteria evaluation included the way mandates, requirements, and arguments applied to sites and networks and, in some cases, to both. Therefore, mandates were discussed from both a site and a network perspective. It also became apparent that many things considered mandates were actually negotiable, depending on the possibility of transferring the requirement from one site to another.

To organize, streamline, facilitate, and objectify the monitoring criteria discussion, an Excel workbook was developed. Its design focused on the most basic siting criteria: monitoring objective and spatial scale for each pollutant currently monitored in the network. This resulted in a table with ten columns, one for each objective or scale, and 6 rows, one for each pollutant monitored. This basic table was then replicated many times to create a complete workbook that contained each element of each logical argument for each site. The logical arguments of this analysis comprised keeping or closing a site based on mandated criteria, negotiable mandated criteria, value added criteria, and value lost criteria.

The ranking exercise was completed with a discussion that included all monitoring-related personnel. Each objective and scale for each pollutant was compared to selected monitoring, budget, safety, and operational criteria, with consensus as the objective. The ranking logic included three basic arguments to separate six groupings:

- *Mandated to keep or close* created the highest and lowest groupings.
- *Negotiable mandates to keep or close* created the second and next to last groupings.
- *Value added/lost reasons to keep or close* created the middle groupings.

Monitors identified as *mandated to keep* were the highest priority, so sites with these monitors ranked highest on the list. An example of a mandate to keep a monitor is a SIP or grant requirement to monitor a specific pollutant at a specific location. Appendix C provides a complete list of the mandates used to rank sites.

Monitors identified as *negotiable mandated to keep* formed the second-highest priority group. Each site with these monitors was ranked within the group based on the total number of mandates to keep it, with higher numbers of total mandates ranked above lower numbers. Examples of negotiable mandates to keep a monitor include:

- Total number of monitors required in the network.
- Design value monitors when three monitors at three adjacent sites correlate within 1 part per billion and have an r^2 value of greater than 0.9.

Appendix C provides a complete list of the mandates used to rank these sites.

Monitors with nonmandated tangible or intangible benefits were evaluated as *valuable to keep* or as *not adding value*; these form the middle, or third and fourth, group. This is the least objective element of the analysis, since it relies on experience or expert judgment. Sites with these monitors were ranked based on a sum of the total value added. Examples of value-added considerations include historical trends, population served, and operating costs. Appendix C contains a complete list of the "nonmandates" used in these rankings.

Monitors identified as *negotiable mandated to close* formed the fifth (next to lowest) priority group. Each site with these monitors was ranked within the group based on the total number of mandates to close, with the lowest number of total mandates ranking above the highest numbers. Examples of negotiable mandates to close include:

- Expired lease, but no eviction notice.
- Need for costly improvements at the shelter or site.
- High correlation to a nearby monitor.

Appendix C provides a complete list of the mandates used to rank these sites.

The lowest priority group, *mandated to close*, contained sites that had received eviction notices from landowners.

11.2 FINAL PRIORITIZATION ANALYSIS

After the workbook was populated, the results tabulated and initial sorting completed, it was apparent that the technique used to sort or prioritize had a significant impact on the rankings. The approach up to that point had favored sites that had more monitors, i.e., sites with more monitors were likely to have a larger raw score. This weighting had some value, but should not have been

a dominant influence in the rankings. Therefore, an additional analysis was added to balance the prioritization: a normalized sorting effort.

To get a normalized matrix, each subtable in each worksheet was summarized and divided by the total number of possible populations. For example, if there were three justifications and two monitors, then the total theoretical number of items that could have been populated was three multiplied by four (two objective plus two scale), or twelve. The number of actual justifications entered into this subtable would therefore be divided by 12 to provide a fractional value for comparison.

A total of eight sorts were completed. The following ones seemed to provide the most balanced results:

- Sorting raw results from the perspective of keeping sites open.
- Sorting raw results from the perspective of keeping sites open based on the differences between mandates and value-added justification totals.
- Sorting raw results from the perspective of closing sites.
- Sorting raw results from the perspective of closing sites based on the differences between mandates and value-added justification totals.
- Sorting normalized results from the perspective of keeping sites open.
- Sorting normalized results from the perspective of keeping sites open based on the differences between mandates and value-added justification totals.
- Sorting normalized results from the perspective of closing sites.
- Sorting normalized results from the perspective of closing sites based on the differences between mandates and value-added justification totals.

In each of the eight sorts, the result table was divided in half, with half the sites considered "keep" and the other half considered "close". A final table was prepared that identified the number of times a site fell into the "keep" half or the "close" half.

Three sites appeared in the "close" group of every sort: Craig Road, Mesquite, and Orr. Based on monitoring criteria, these sites are considered the lowest priority for keeping. Two sites, Apex and Green Valley, appeared in all but one "close" group; these are considered the next lowest priority for keeping, based on monitoring criteria. Two sites appeared in the "close" group in six of the eight sorts: East Sahara and Walter Johnson. These seven sites are therefore primary candidates for closure, according to DAQEM's analysis. All other sites appeared in the "keep" group more than in the "close" group.

11.3 FINAL DECISION

The final decision on closing sites and monitors was a policy decision. Management reviewed the list of seven sites, considering liability and political issues, as stakeholders provided input on

potential impacts on their data needs (Table 14). The final shutdowns were evaluated for cost reductions and reviewed to ensure EPA requirements would continue to be met.

Table 14. Technical and Policy Inputs

Site	Monitoring-Based Closure Groupings	Stakeholder Recommendation	Management Review	Conclusion
Craig Road	8 C	C (except summer Ozone)		C (except summer ozone)
Mesquite	8 C	C (except summer Ozone)		C (find alternative for summer ozone)
Orr	8 C	C		C
Apex	7 C	C (except summer Ozone)		C (except summer ozone)
Green Valley	7 C	K (add summer ozone)	K	K
East Sahara	6 C	C		C
Lone Mountain	6	C	C	C
J.D. Smith	4 K	K		K
Walter Johnson	4 K	C (except summer Ozone)		K
Boulder City	1 K	K (reduce ozone to summer only)		K
Jean	1 K	K (reduce ozone to summer only)		K
Joe Neal	1 K	K (reduce ozone & NO_x to summer only)		K
Palo Verde	1 K	K (close ozone)		K
Sunrise Acres	1 K	K (reduce ozone to summer only)		K
Winterwood	1 K	C		K
Paul Meyer	0 K	C (except summer ozone)		K

Note: C = close, K = keep.

12.0 RECOMMENDATIONS

12.1 PRIORITY SITES

DAQEM's analysis shows the following sites are a priority in the Clark County monitoring network and should be maintained during the next five years:

- Paul Meyer
- Boulder City
- Jean
- Joe Neal
- Palo Verde
- Sunrise Acres
- Walter Johnson
- Green Valley.

The following Clark County network sites should be shut down within the next five years:

- Craig Road
- Mesquite
- Orr
- Apex
- East Sahara
- Lone Mountain.

Lastly, the following sites have some value in the network, but are not considered a priority:

- J.D. Smith
- Winterwood.

12.2 LOCATIONS TO EVALUATE FOR NEW SITES

The following locations should be evaluated within the next five years for suitability as future permanent monitoring sites.

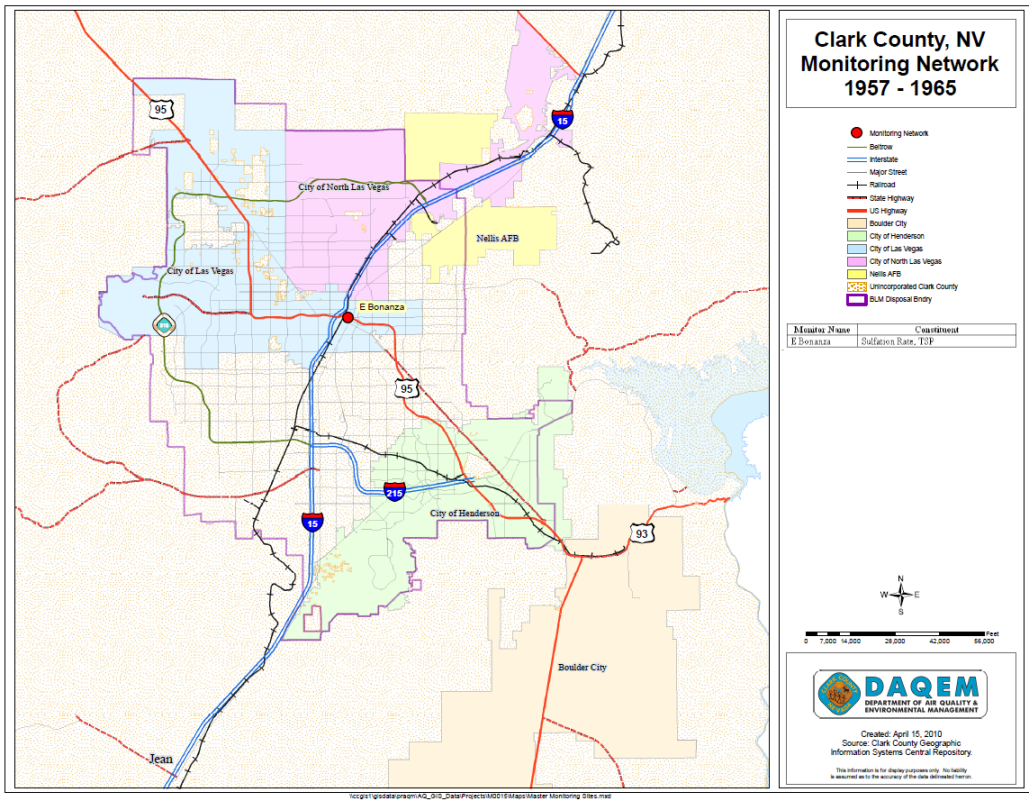
- O_3:
    - Two locations in California: in Death Valley and on the state border along the I-15 corridor.
    - One location in Pahrump Valley.
    - One location in the mountain range west of the Las Vegas Valley.
    - One location on the Paiute tribal reservation.
    - One location in Indian Springs.
    - One location in the northwest foothills.

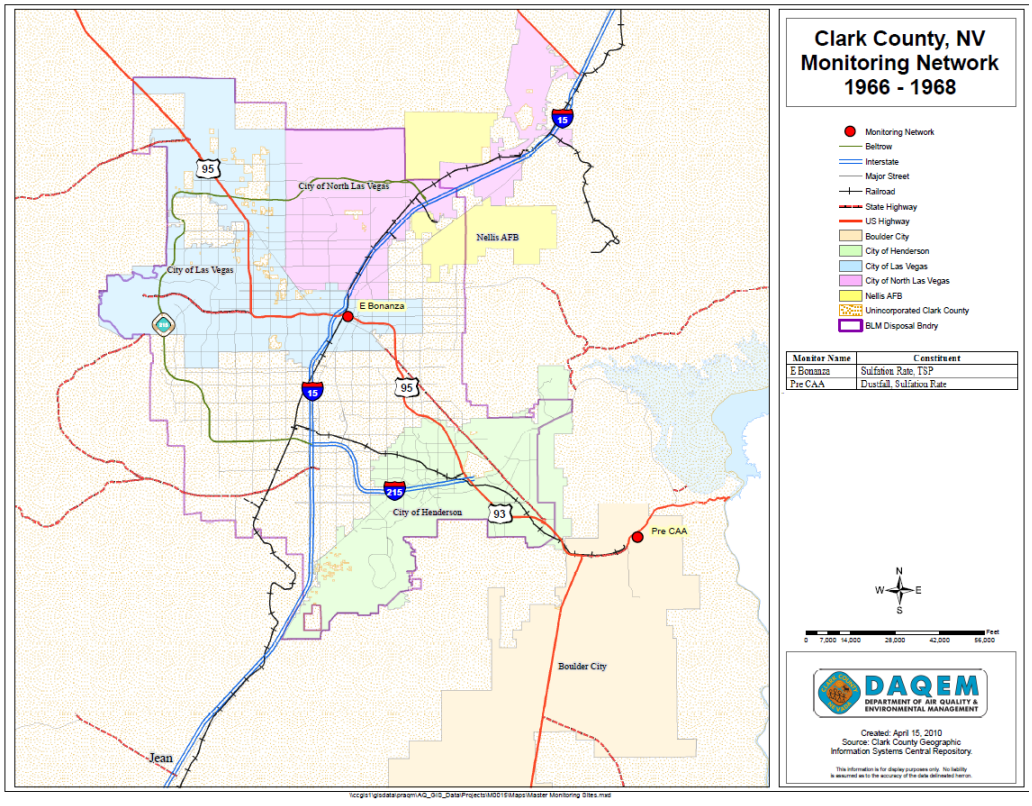
  - One location in the Craig Ranch area.
  - One location at Black Mountain.

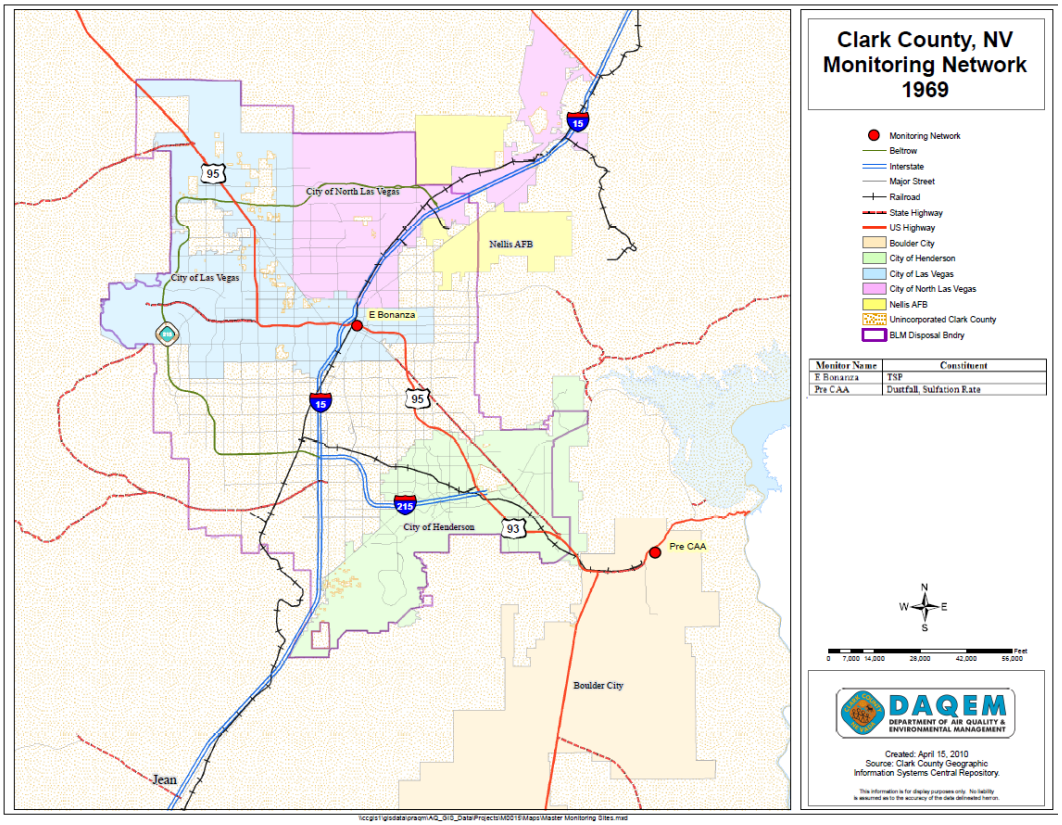
- $PM_{2.5}$:
  - Two locations along the I-15 corridor: at the southern and northeastern entrances to the valley.
  - One location in Sunrise Manor, in the mountain range east of the valley.

- PM_{10}:
  - Location(s) in the extreme south and southwest of the Las Vegas Valley and in Sandy Valley.

APPENDIX A: HISTORICAL MONITORING MAPS






Clark County, NV
Monitoring Network
1969
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name
Constituent
E Bonanza
TSP
Pre CAA
Dustfall, Sulfation Rate
City of North Las Vegas
Nellis AFB
City of Las Vegas
E Bonanza
City of Henderson
Pre CAA
Boulder City
Jean
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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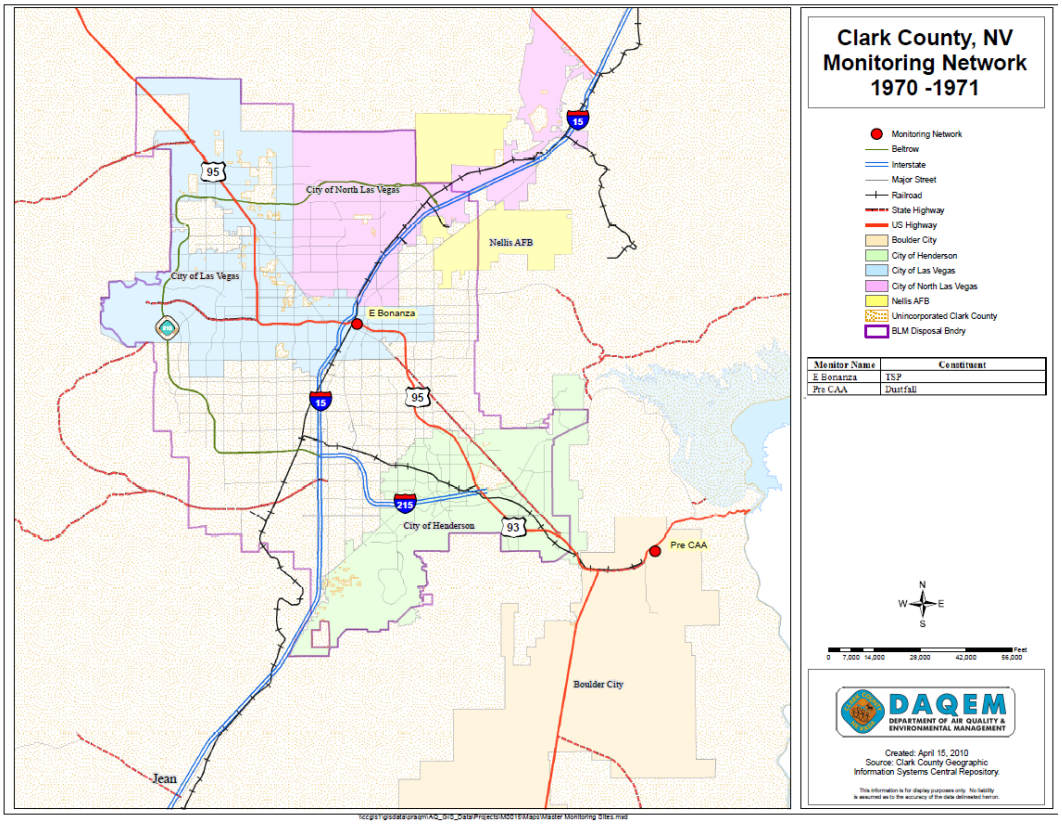
Clark County, NV
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1970 -1971
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name
Constituent
E Bonanza
TSP
Pre CAA
Dustfall
City of North Las Vegas
Nellis AFB
City of Las Vegas
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City of Henderson
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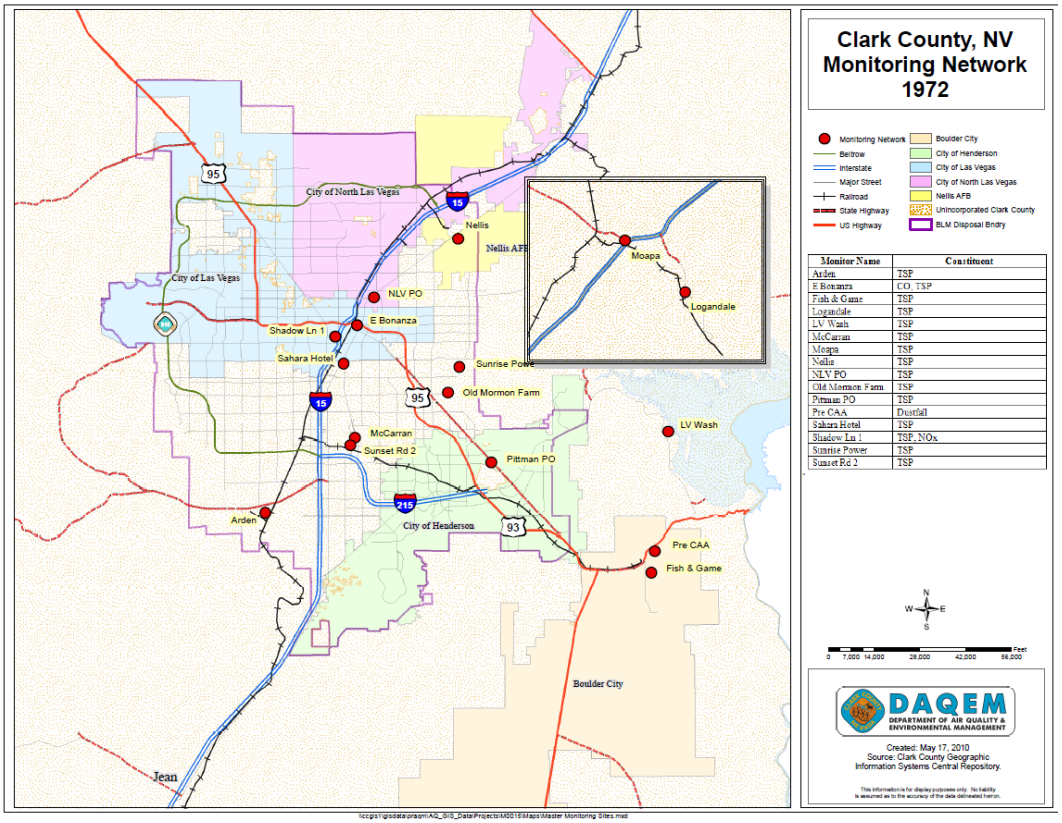
Clark County, NV
Monitoring Network
1972
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Arden | TSP
E Bonanza | CO, TSP
Fish & Game | TSP
Logandale | TSP
LV Wash | TSP
McCarran | TSP
Moapa | TSP
Nellis | TSP
NLV PO | TSP
Old Mormon Farm | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | TSP, NOx
Sunrise Power | TSP
Sunset Rd 2 | TSP
City of North Las Vegas
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City of Las Vegas
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Shadow Ln 1
Sahara Hotel
Sunrise Power
Old Mormon Farm
McCarran
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Fish & Game
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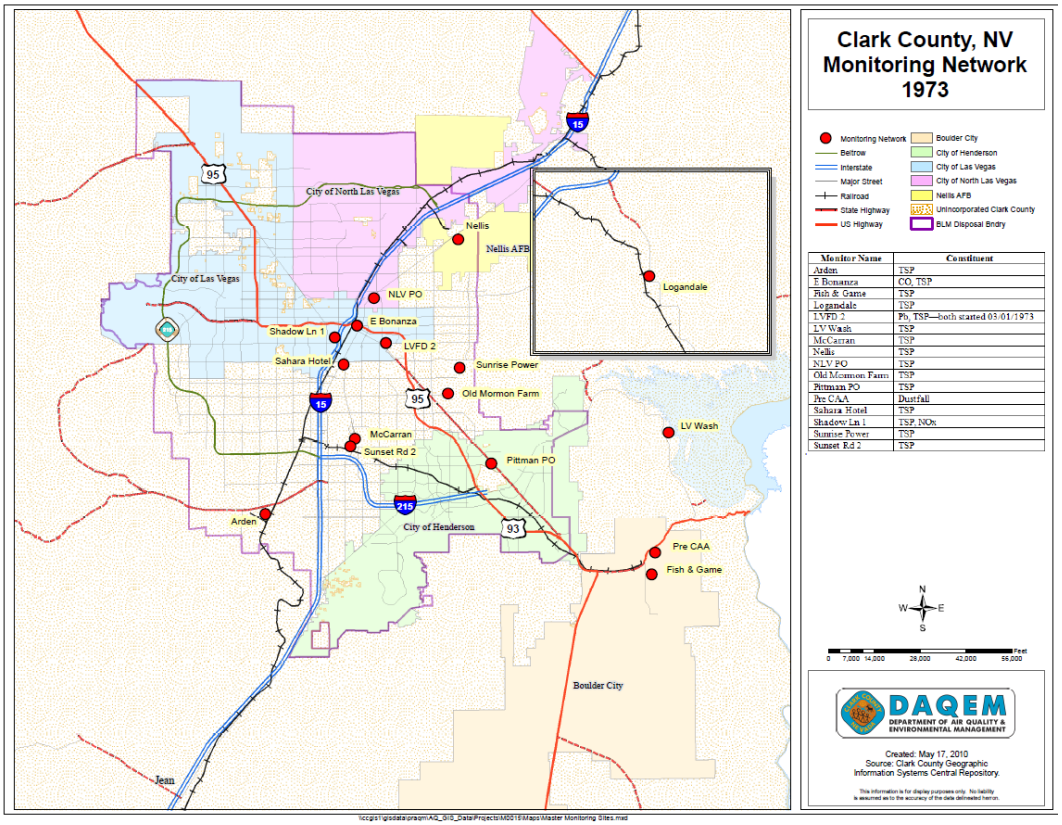
Clark County, NV
Monitoring Network
1973
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Beltrow
Interstate
Major Street
Railroad
State Highway
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Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Arden | TSP
E Bonanza | CO, TSP
Fish & Game | TSP
Logandale | TSP
LVFD 2 | Pb, TSP—both started 03/01/1973
LV Wash | TSP
McCarran | TSP
Nellis | TSP
NLV PO | TSP
Old Mormon Farm | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | TSP, NOx
Sunrise Power | TSP
Sunset Rd 2 | TSP
City of North Las Vegas
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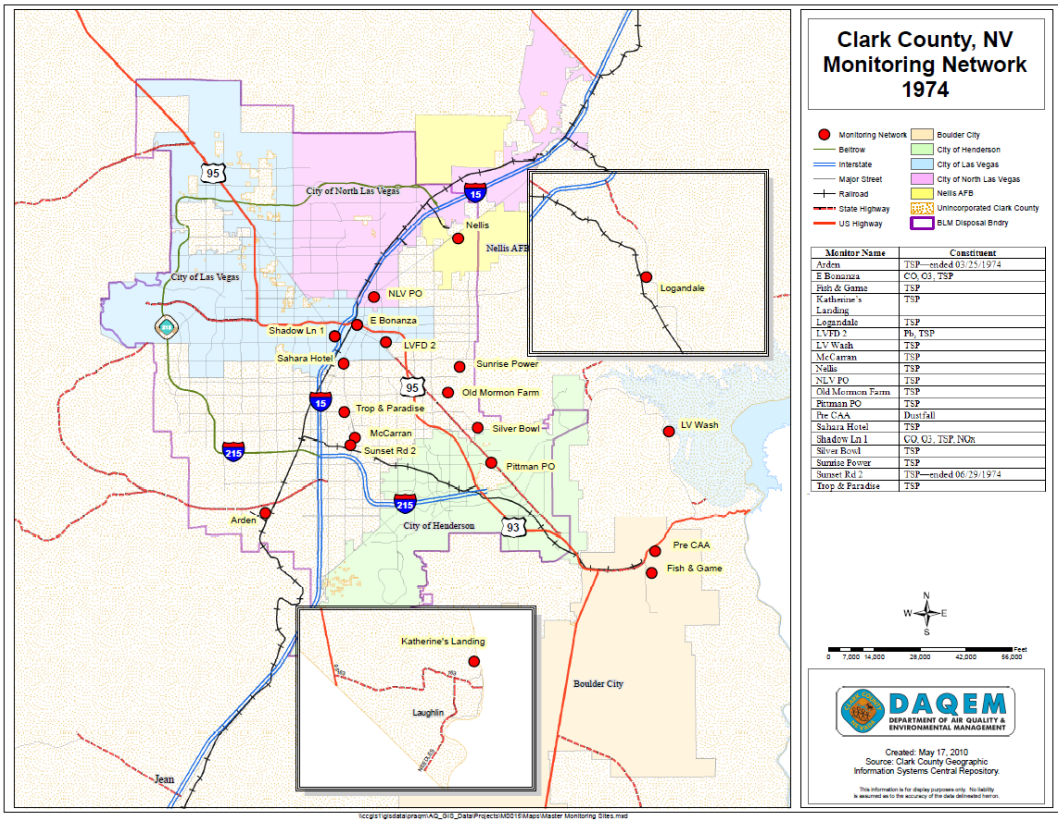
Clark County, NV
Monitoring Network
1974
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City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Arden | TSP—ended 03/25/1974
E Bonanza | CO, O3, TSP
Fish & Game | TSP
Katherine's Landing | TSP
Logandale | TSP
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | TSP
Nellis | TSP
NLV PO | TSP
Old Mormon Farm | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | CO, O3, TSP, NOx
Silver Bowl | TSP
Sunrise Power | TSP
Sunset Rd 2 | TSP—ended 06/29/1974
Trop & Paradise | TSP
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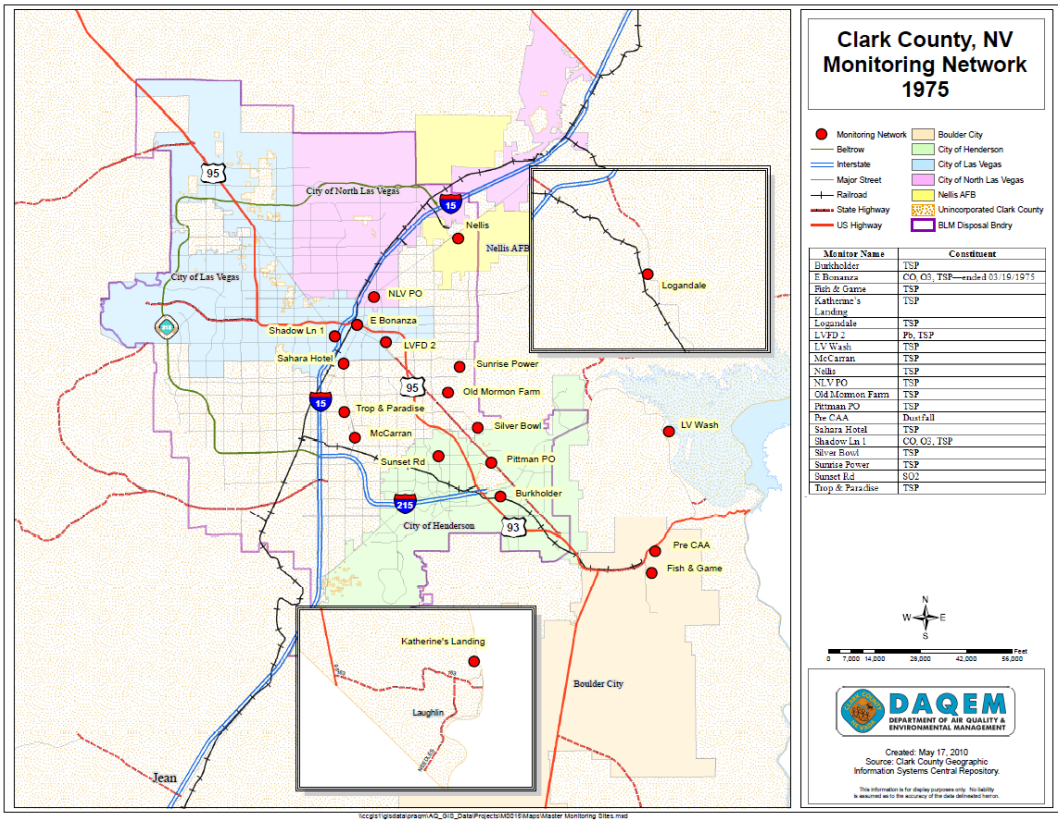
Clark County, NV
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Monitor Name | Constituent
Burkholder | TSP
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Fish & Game | TSP
Katherine's Landing | TSP
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LV Wash | TSP
McCarran | TSP
Nellis | TSP
NLV PO | TSP
Old Mormon Farm | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | CO, O3, TSP
Silver Bowl | TSP
Sunrise Power | TSP
Sunset Rd | SO2
Trop & Paradise | TSP
City of North Las Vegas
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Logandale
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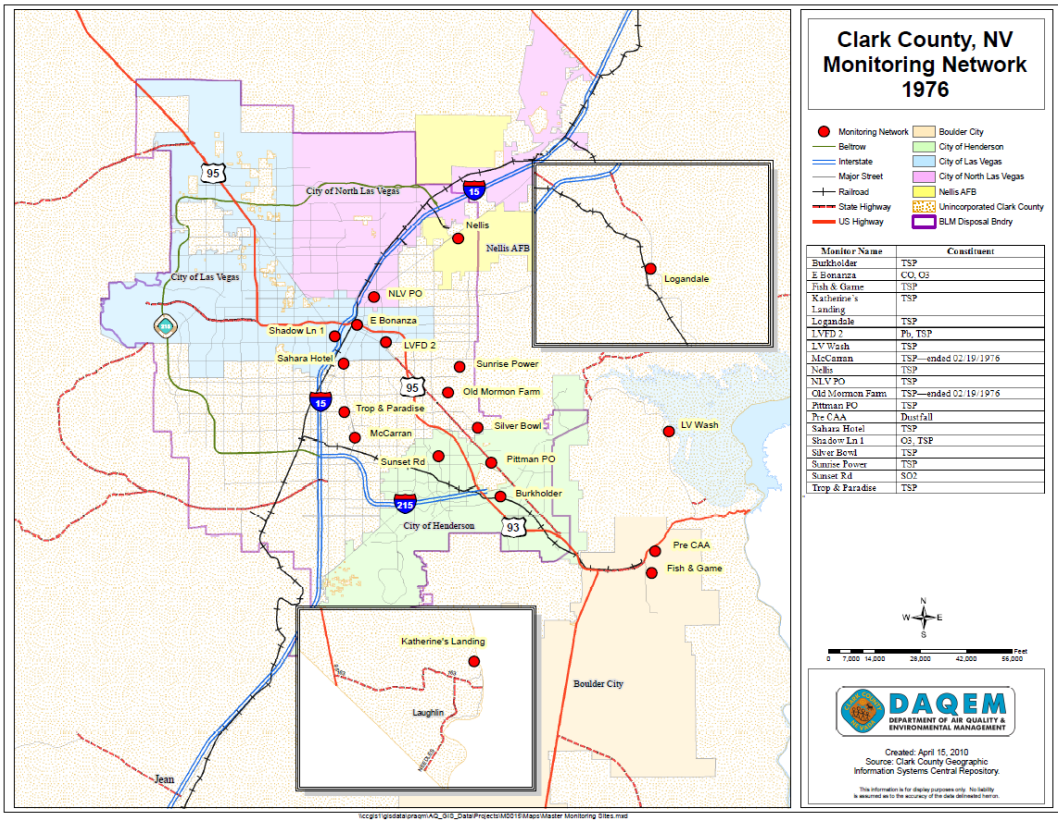
Clark County, NV
Monitoring Network
1976
Monitoring Network
Beltrow
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Major Street
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State Highway
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Boulder City
City of Henderson
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City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Burkholder | TSP
E Bonanza | CO, O3
Fish & Game | TSP
Katherine's Landing | TSP
Logandale | TSP
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | TSP—ended 02/19/1976
Nellis | TSP
NLV PO | TSP
Old Mormon Farm | TSP—ended 02/19/1976
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | O3, TSP
Silver Bowl | TSP
Sunrise Power | TSP
Sunset Rd | SO2
Trop & Paradise | TSP
City of North Las Vegas
Nellis
Nellis AFB
Logandale
City of Las Vegas
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Sahara Hotel
Sunrise Power
Old Mormon Farm
Trop & Paradise
Silver Bowl
LV Wash
McCarran
Sunset Rd
Pittman PO
Burkholder
City of Henderson
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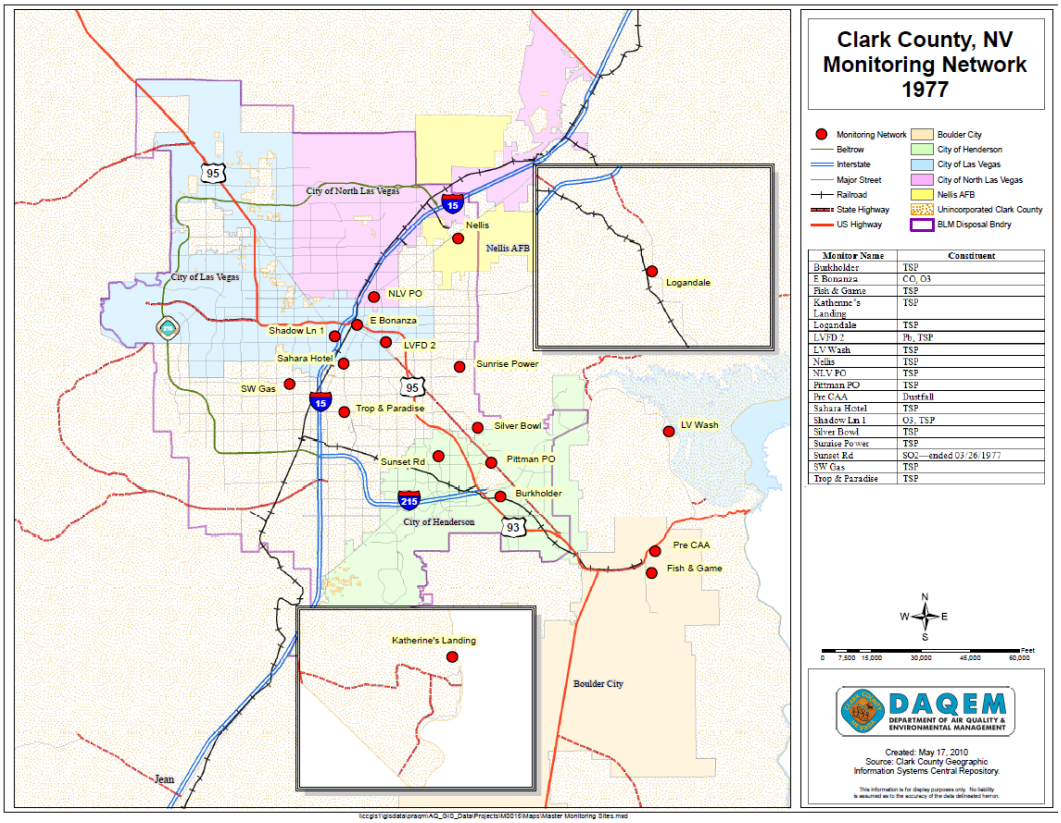
Clark County, NV
Monitoring Network
1977
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Burkholder | TSP
E Bonanza | CO, O3
Fish & Game | TSP
Katherine's Landing | TSP
Logandale | TSP
LVFD 2 | Pb, TSP
LV Wash | TSP
Nellis | TSP
NLV PO | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | O3, TSP
Silver Bowl | TSP
Sunrise Power | TSP
Sunset Rd | SO2—ended 03/26/1977
SW Gas | TSP
Trop & Paradise | TSP
City of North Las Vegas
Nellis
Nellis AFB
Logandale
City of Las Vegas
NLV PO
E Bonanza
Shadow Ln 1
LVFD 2
Sahara Hotel
Sunrise Power
SW Gas
Trop & Paradise
Silver Bowl
LV Wash
Sunset Rd
Pittman PO
Burkholder
City of Henderson
Pre CAA
Fish & Game
Katherine's Landing
Boulder City
Jean
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DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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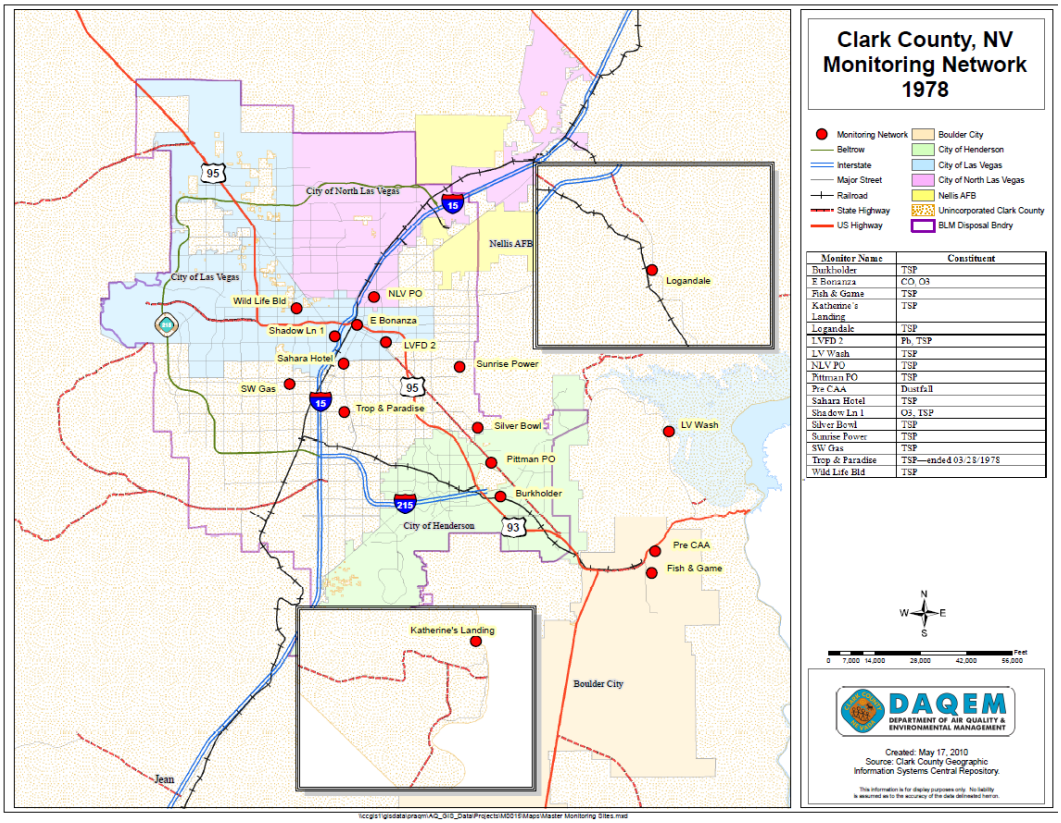
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Monitoring Network
1978
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Moniter Name | Constituent
Burkholder | TSP
E Bonanza | CO, O3
Fish & Game | TSP
Katherine's Landing | TSP
Logandale | TSP
LVFD 2 | Pb, TSP
LV Wash | TSP
NLV PO | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | O3, TSP
Silver Bowl | TSP
Sunrise Power | TSP
SW Gas | TSP
Trop & Paradise | TSP—ended 03/28/1978
Wild Life Bld | TSP
City of North Las Vegas
Nellis AFB
Logandale
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
Shadow Ln 1
LVFD 2
Sahara Hotel
Sunrise Power
SW Gas
Trop & Paradise
Silver Bowl
LV Wash
Pittman PO
Burkholder
City of Henderson
Pre CAA
Fish & Game
Katherine's Landing
Boulder City
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DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
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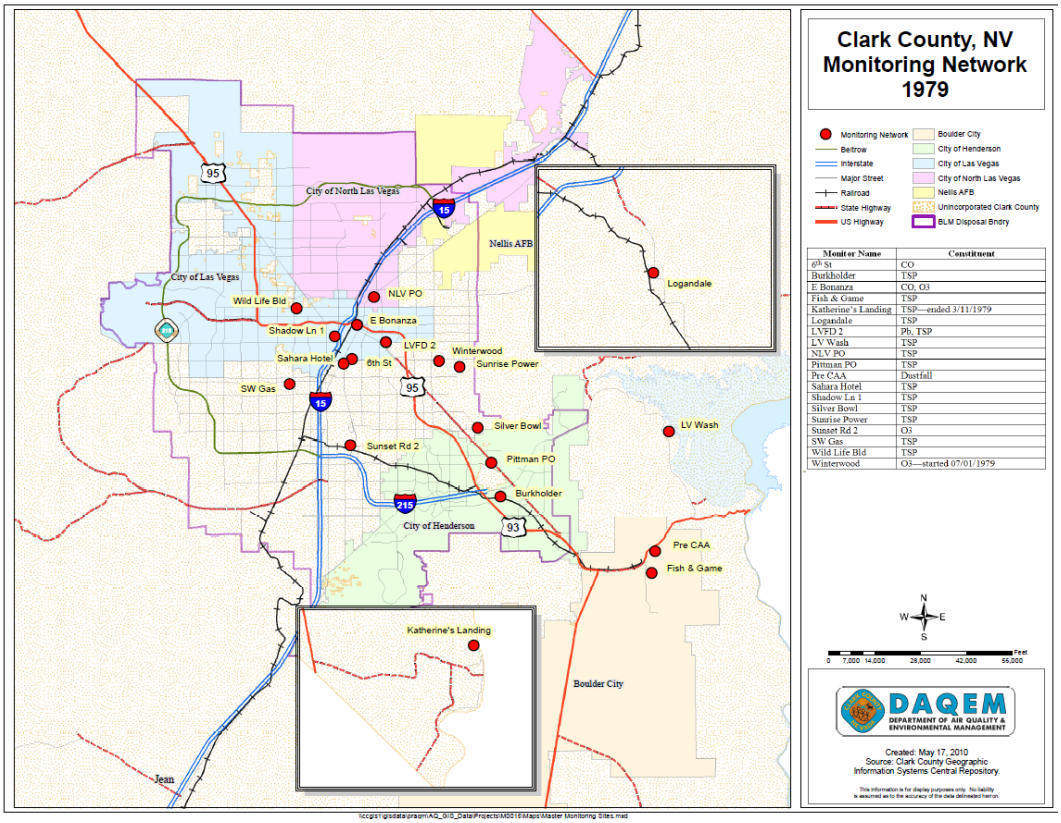
Clark County, NV
Monitoring Network
1979
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
6th St | CO
Burkholder | TSP
E Bonanza | CO, O3
Fish & Game | TSP
Katherine's Landing | TSP—ended 3/11/1979
Logandale | TSP
LVFD 2 | Pb, TSP
LV Wash | TSP
NLV PO | TSP
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
Shadow Ln 1 | TSP
Silver Bowl | TSP
Sunrise Power | TSP
Sunset Rd 2 | O3
SW Gas | TSP
Wild Life Bld | TSP
Winterwood | O3—started 07/01/1979
City of North Las Vegas
Nellis AFB
Logandale
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
Shadow Ln 1
LVFD 2
Sahara Hotel
6th St
Winterwood
Sunrise Power
SW Gas
Silver Bowl
LV Wash
Sunset Rd 2
Pittman PO
Burkholder
City of Henderson
Pre CAA
Fish & Game
Katherine's Landing
Boulder City
Jean
N
W
E
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
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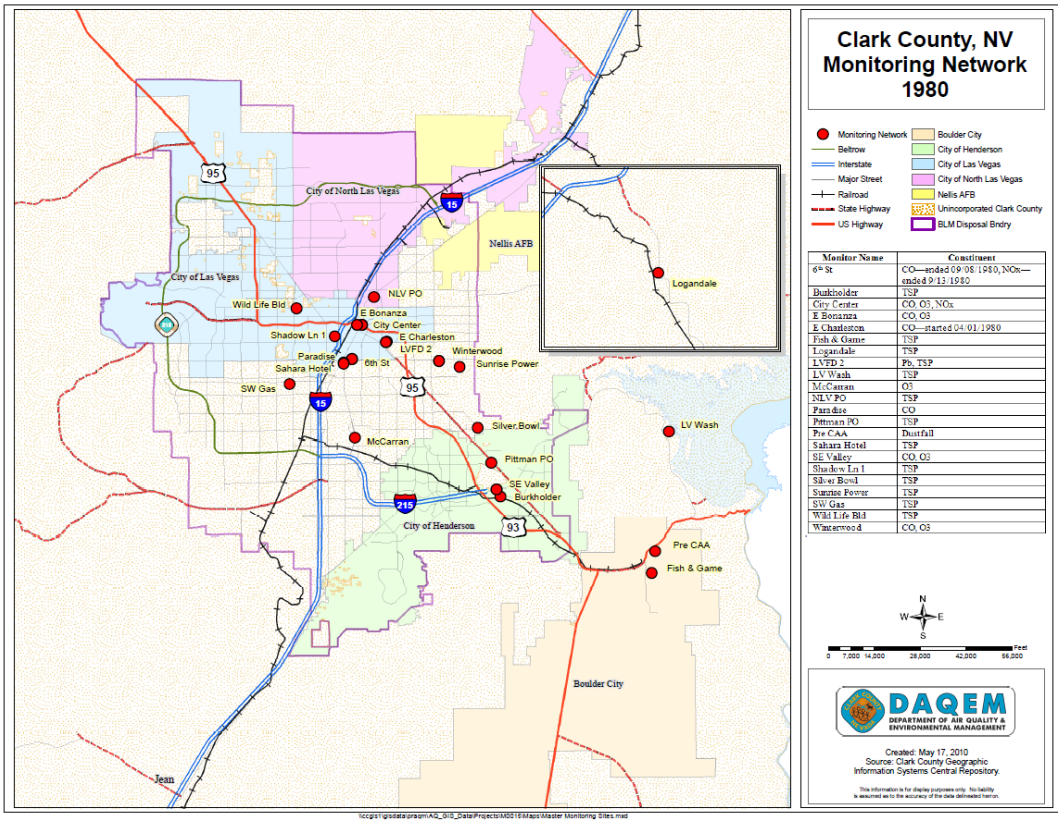
Clark County, NV
Monitoring Network
1980
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
6th St | CO—ended 09/08/1980, NOx—ended 9/13/1980
Burkholder | TSP
City Center | CO, O3, NOx
E Bonanza | CO, O3
E Charleston | CO—started 04/01/1980
Fish & Game | TSP
Logandale | TSP
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP
Paradise | CO
Pittman PO | TSP
Pre CAA | Dustfall
Sahara Hotel | TSP
SE Valley | CO, O3
Shadow Ln 1 | TSP
Silver Bowl | TSP
Sunrise Power | TSP
SW Gas | TSP
Wild Life Bld | TSP
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
Logandale
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
City Center
Shadow Ln 1
E Charleston
LVFD 2
Winterwood
Paradise
Sahara Hotel
6th St
Sunrise Power
SW Gas
Silver Bowl
LV Wash
McCarran
Pittman PO
SE Valley
Burkholder
City of Henderson
Pre CAA
Fish & Game
Boulder City
Jean
N
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E
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Feet
0 7,000 14,000 28,000 42,000 56,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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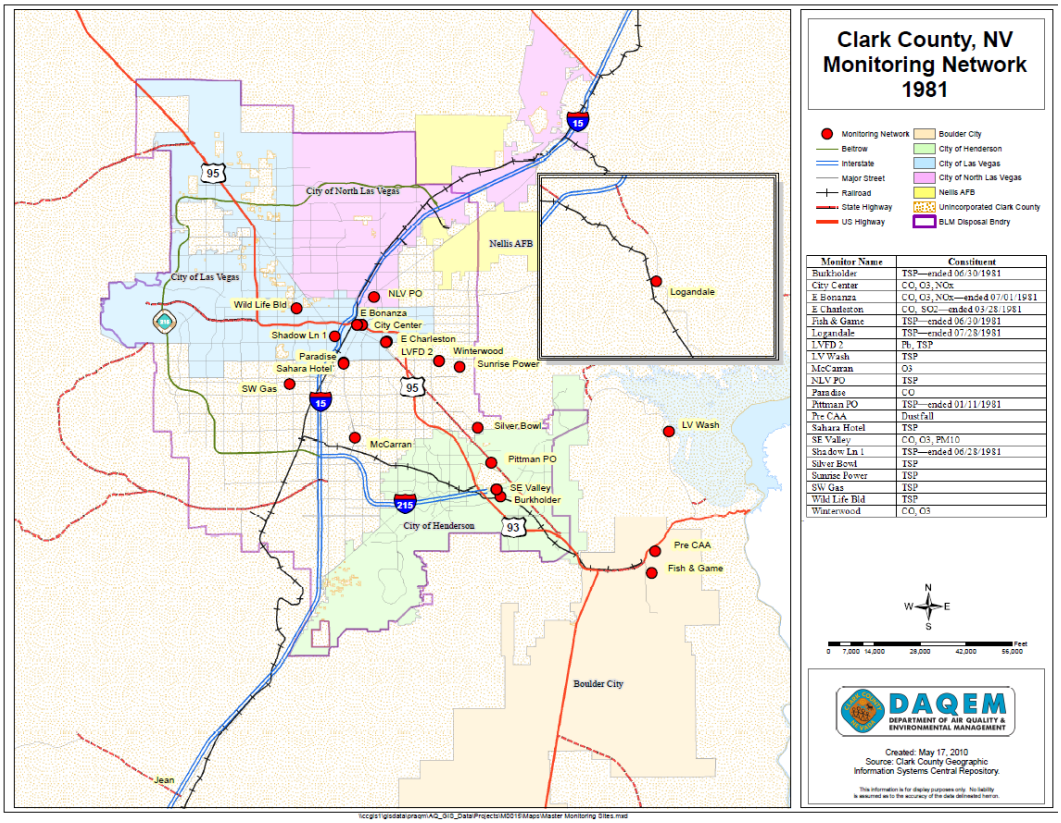
Clark County, NV
Monitoring Network
1981
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Burkholder | TSP—ended 06/30/1981
City Center | CO, O3, NOx
E Bonanza | CO, O3, NOx—ended 07/01/1981
E Charleston | CO, SO2—ended 03/28/1981
Fish & Game | TSP—ended 06/30/1981
Logandale | TSP—ended 07/28/1981
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP
Paradise | CO
Pittman PO | TSP—ended 01/11/1981
Pre CAA | Dustfall
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
Shadow Ln 1 | TSP—ended 06/28/1981
Silver Bowl | TSP
Sunrise Power | TSP
SW Gas | TSP
Wild Life Bld | TSP
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
Logandale
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
City Center
Shadow Ln 1
E Charleston
LVFD 2
Winterwood
Paradise
Sahara Hotel
Sunrise Power
SW Gas
Silver Bowl
LV Wash
McCarran
Pittman PO
SE Valley
Burkholder
City of Henderson
Pre CAA
Fish & Game
Boulder City
Jean
N
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Feet
0 7,000 14,000 28,000 42,000 56,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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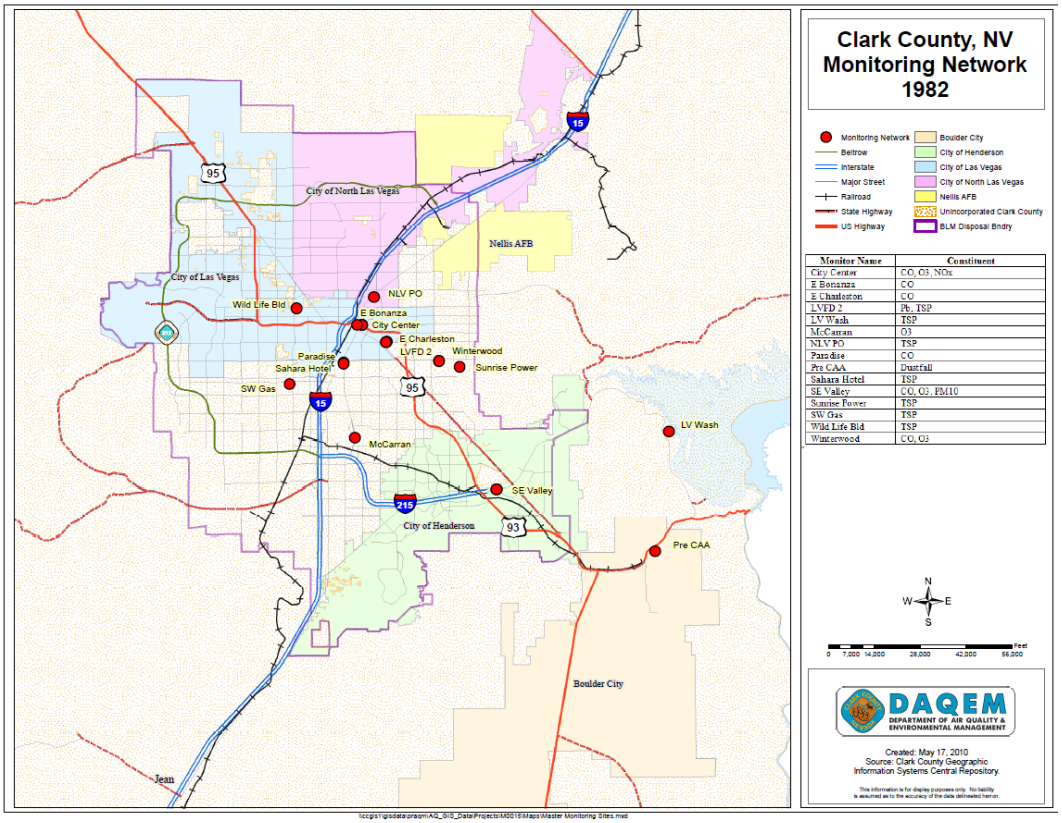
Clark County, NV
Monitoring Network
1982
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
City Center | CO, O3, NOx
E Bonanza | CO
E Charleston | CO
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP
Paradise | CO
Pre CAA | Dustfall
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
Sunrise Power | TSP
SW Gas | TSP
Wild Life Bld | TSP
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
City Center
E Charleston
LVFD 2
Winterwood
Paradise
Sahara Hotel
Sunrise Power
SW Gas
McCarran
LV Wash
SE Valley
City of Henderson
Pre CAA
Boulder City
Jean
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Feet
0 7,000 14,000 28,000 42,000 56,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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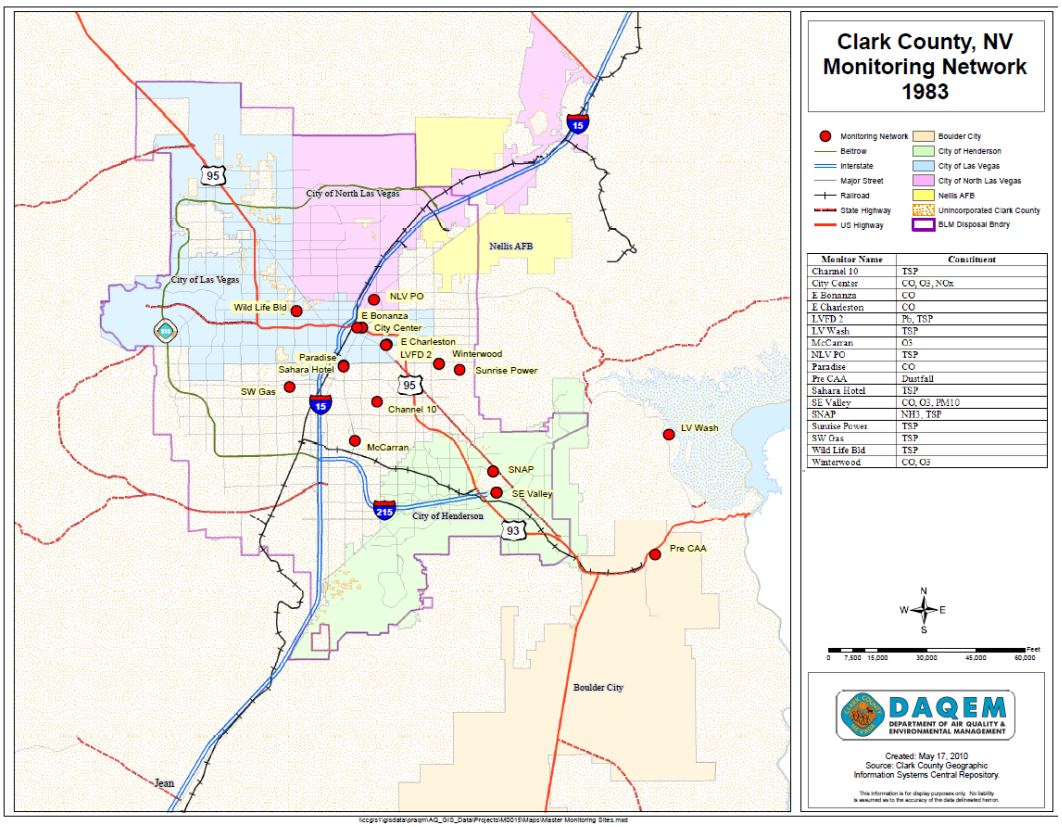
Clark County, NV
Monitoring Network
1983
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Channel 10 | TSP
City Center | CO, O3, NOx
E Bonanza | CO
E Charleston | CO
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP
Paradise | CO
Pre CAA | Dustfall
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
SNAP | NH3, TSP
Sunrise Power | TSP
SW Gas | TSP
Wild Life Bld | TSP
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
City Center
E Charleston
LVFD 2
Winterwood
Paradise
Sahara Hotel
Sunrise Power
SW Gas
Channel 10
McCarran
LV Wash
SNAP
SE Valley
City of Henderson
Pre CAA
Boulder City
Jean
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W
E
S
Feet
0 7,500 15,000 30,000 45,000 60,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
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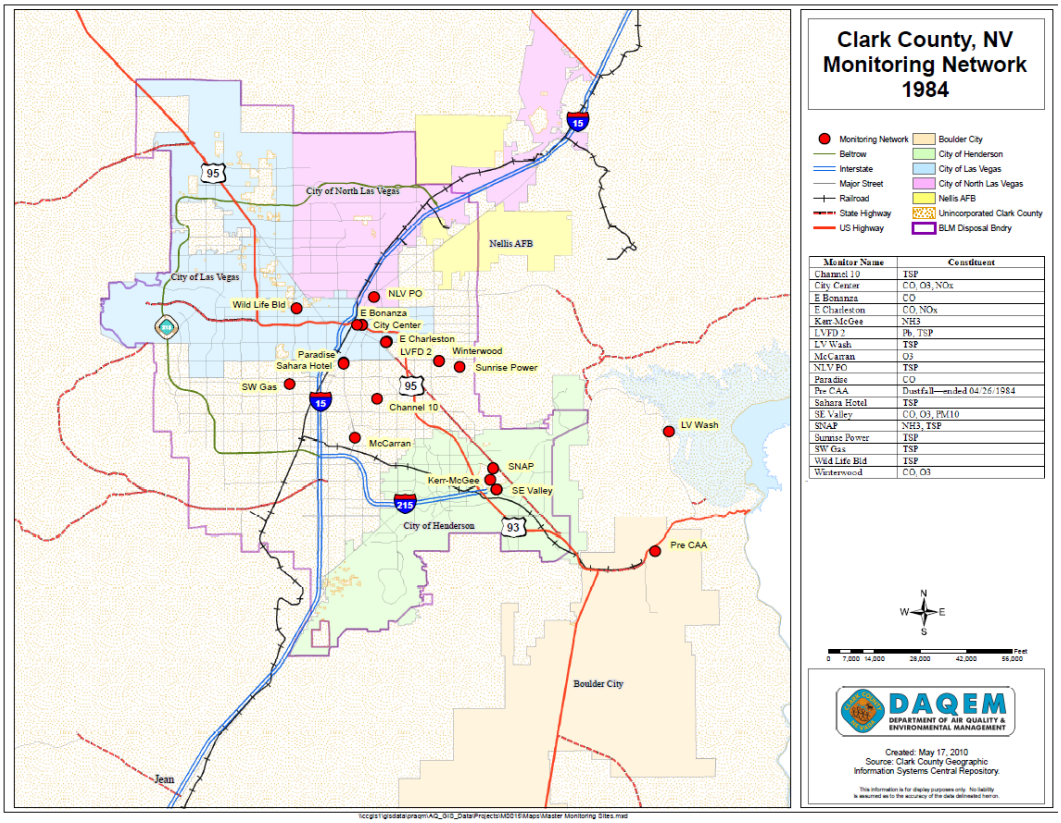
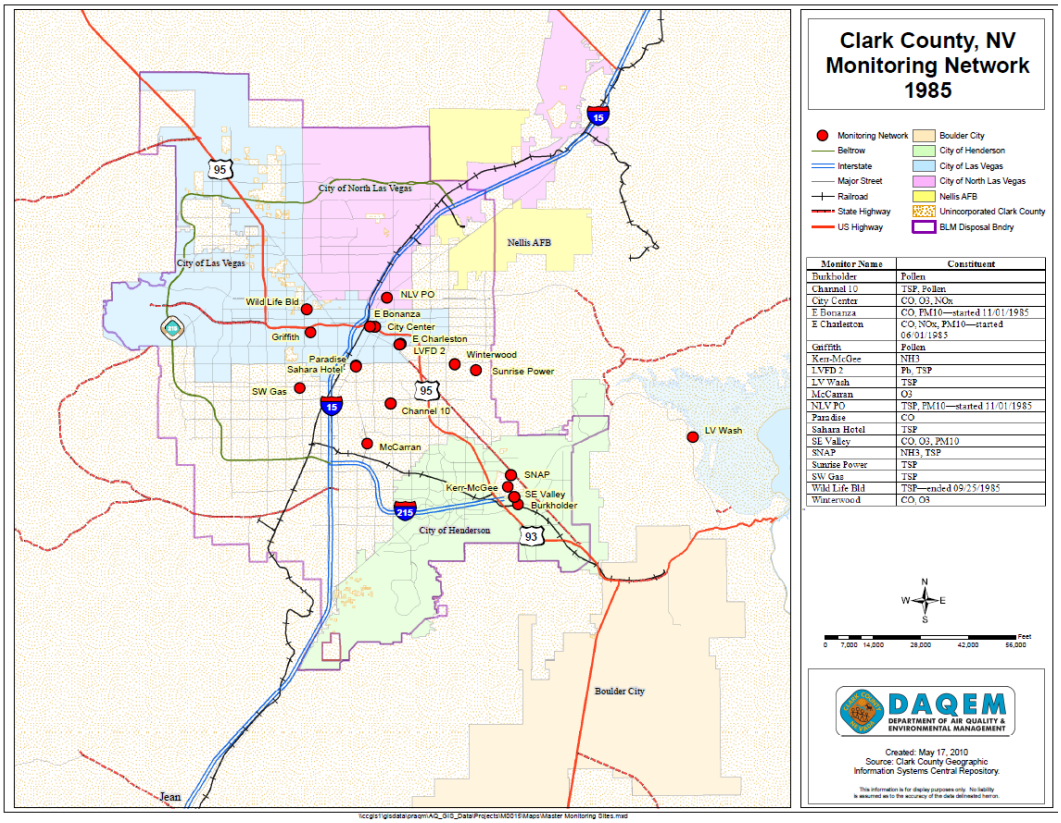

Clark County, NV
Monitoring Network
1984
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Channel 10 | TSP
City Center | CO, O3, NOx
E Bonanza | CO
E Charleston | CO, NOx
Kerr-McGee | NH3
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP
Paradise | CO
Pre CAA | Dust fall—ended 04/26/1984
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
SNAP | NH3, TSP
Sunrise Power | TSP
SW Gas | TSP
Wild Life Bld | TSP
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
City Center
E Charleston
LVFD 2
Winterwood
Paradise
Sahara Hotel
Sunrise Power
SW Gas
Channel 10
LV Wash
McCarran
SNAP
Kerr-McGee
SE Valley
City of Henderson
Pre CAA
Boulder City
Jean
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.


Clark County, NV
Monitoring Network
1985
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Burkholder | Pollen
Channel 10 | TSP, Pollen
City Center | CO, O3, NOx
E Bonanza | CO, PM10—started 11/01/1985
E Charleston | CO, NOx, PM10—started 06/01/1985
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP, PM10—started 11/01/1985
Paradise | CO
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
SNAP | NH3, TSP
Sunrise Power | TSP
SW Gas | TSP
Wild Life Bld | TSP—ended 09/25/1985
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
City of Las Vegas
Wild Life Bld
NLV PO
E Bonanza
City Center
Griffith
E Charleston
LVFD 2
Winterwood
Paradise
Sahara Hotel
Sunrise Power
SW Gas
Channel 10
LV Wash
McCarran
SNAP
Kerr-McGee
SE Valley
Burkholder
City of Henderson
Boulder City
Jean
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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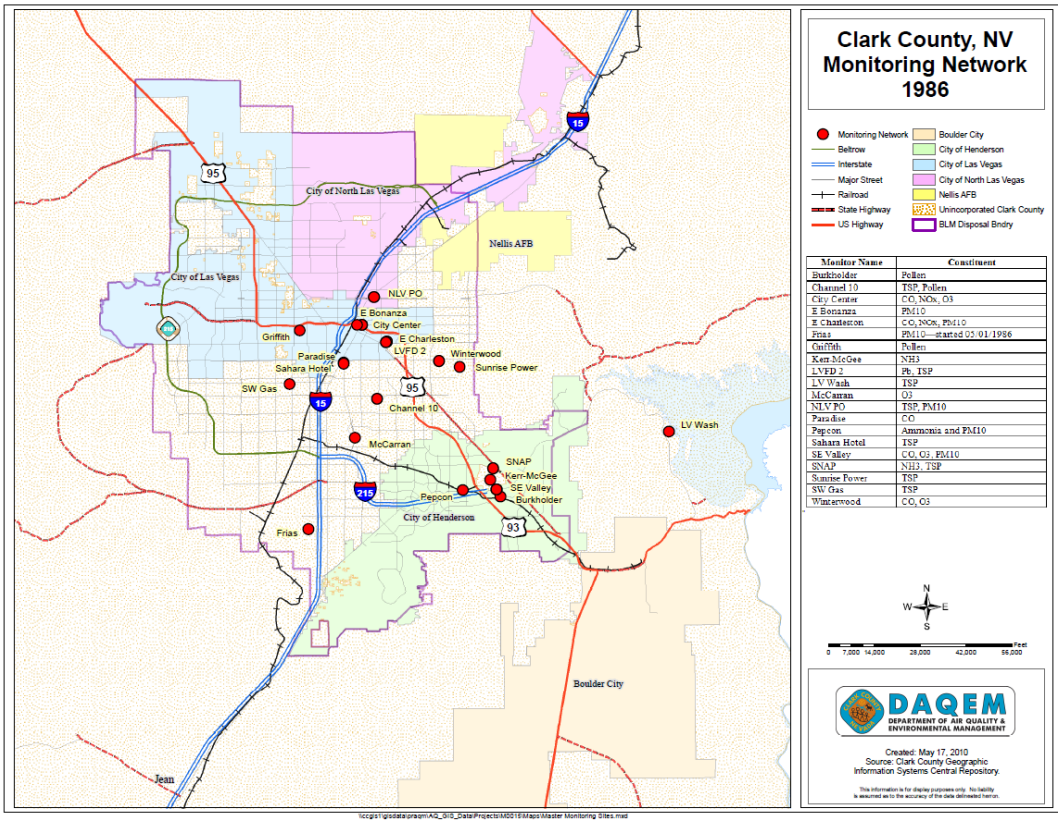
Clark County, NV
Monitoring Network
1986
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Burkholder | Pollen
Channel 10 | TSP, Pollen
City Center | CO, NOx, O3
E Bonanza | PM10
E Charleston | CO, NOx, PM10
Frias | PM10—started 05/01/1986
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | TSP, PM10
Paradise | CO
Pepcon | Ammonia and PM10
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
SNAP | NH3, TSP
Sunrise Power | TSP
SW Gas | TSP
Winterwood | CO, O3
N
W
E
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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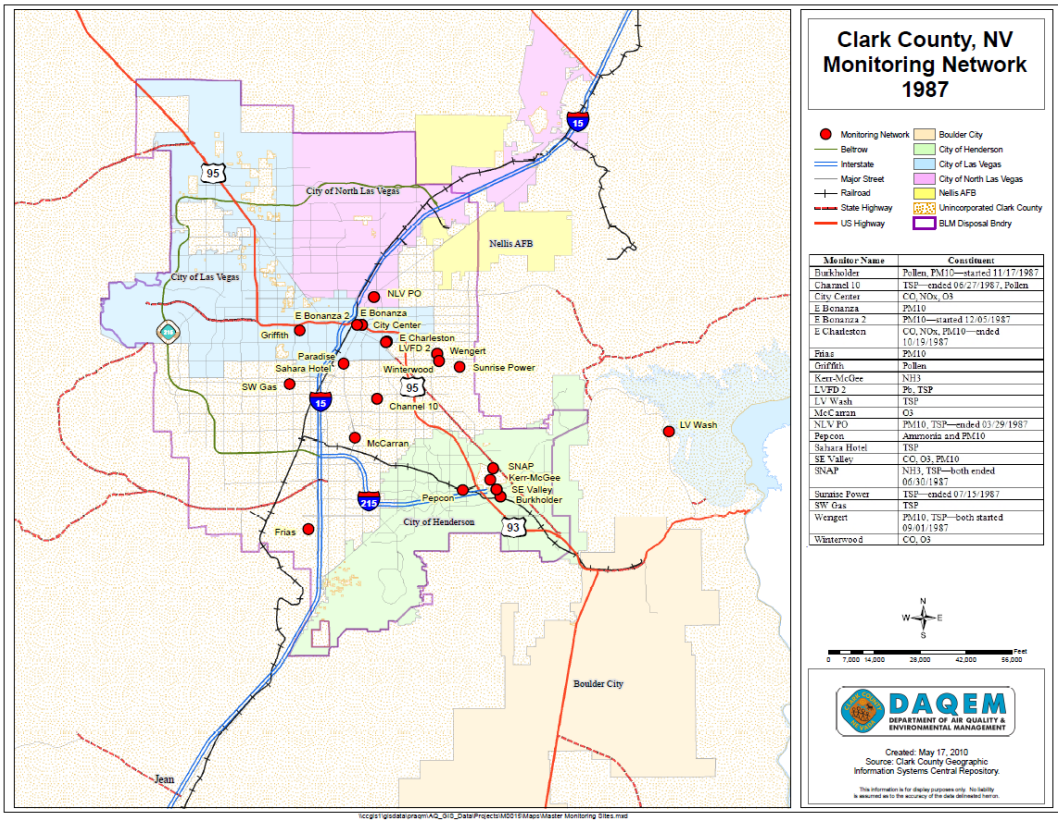
Clark County, NV
Monitoring Network
1987
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Burkholder | Pollen, PM10—started 11/17/1987
Channel 10 | TSP—ended 06/27/1987, Pollen
City Center | CO, NOx, O3
E Bonanza | PM10
E Bonanza 2 | PM10—started 12/05/1987
E Charleston | CO, NOx, PM10—ended 10/19/1987
Frias | PM10
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | PM10, TSP—ended 03/29/1987
Pepcon | Ammonia and PM10
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
SNAP | NH3, TSP—both ended 06/30/1987
Sunrise Power | TSP—ended 07/15/1987
SW Gas | TSP
Wengert | PM10, TSP—both started 09/01/1987
Winterwood | CO, O3
N
W
E
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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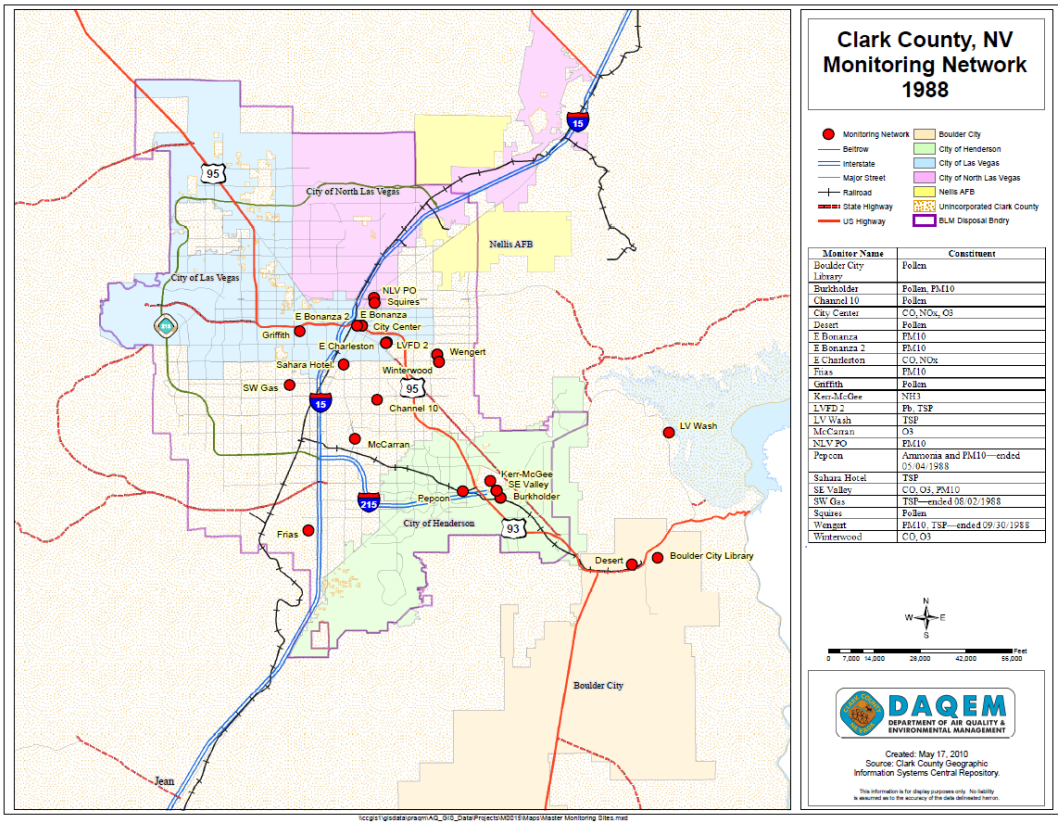
Clark County, NV
Monitoring Network
1988
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
Channel 10 | Pollen
City Center | CO, NOx, O3
Desert | Pollen
E Bonanza | PM10
E Bonanza 2 | PM10
E Charleston | CO, NOx
Frias | PM10
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | Pb, TSP
LV Wash | TSP
McCarran | O3
NLV PO | PM10
Pepcon | Ammonia and PM10—ended 05/04/1988
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
SW Gas | TSP—ended 08/02/1988
Squires | Pollen
Wengert | PM10, TSP—ended 09/30/1988
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
City of Las Vegas
NLV PO
Squires
E Bonanza 2
E Bonanza
City Center
Griffith
E Charleston
LVFD 2
Wengert
Sahara Hotel
Winterwood
SW Gas
Channel 10
McCarran
LV Wash
Kerr-McGee
SE Valley
Burkholder
Pepcon
City of Henderson
Frias
Desert
Boulder City Library
Boulder City
Jean
N
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Feet
0 7,500 14,000 28,000 42,000 56,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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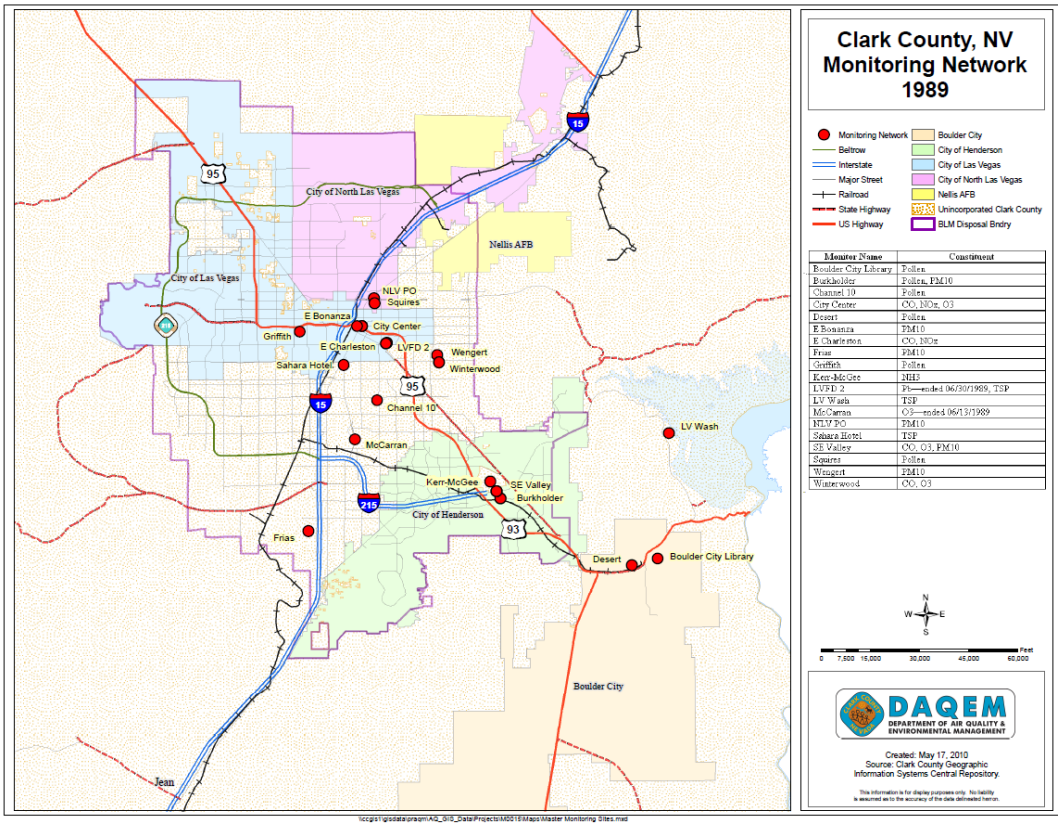
Clark County, NV
Monitoring Network
1989
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
Channel 10 | Pollen
City Center | CO, NOx, O3
Desert | Pollen
E Bonanza | PM10
E Charleston | CO, NOx
Frias | PM10
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | Pb—ended 06/30/1989, TSP
LV Wash | TSP
McCarran | O3—ended 06/13/1989
NLV PO | PM10
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
Squires | Pollen
Wengert | PM10
Winterwood | CO, O3
City of North Las Vegas
Nellis AFB
City of Las Vegas
NLV PO
Squires
E Bonanza
City Center
Griffith
E Charleston
LVFD 2
Wengert
Sahara Hotel
Winterwood
Channel 10
McCarran
LV Wash
Kerr-McGee
SE Valley
Burkholder
City of Henderson
Frias
Desert
Boulder City Library
Boulder City
Jean
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Feet
0 7,500 15,000 30,000 45,000 60,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
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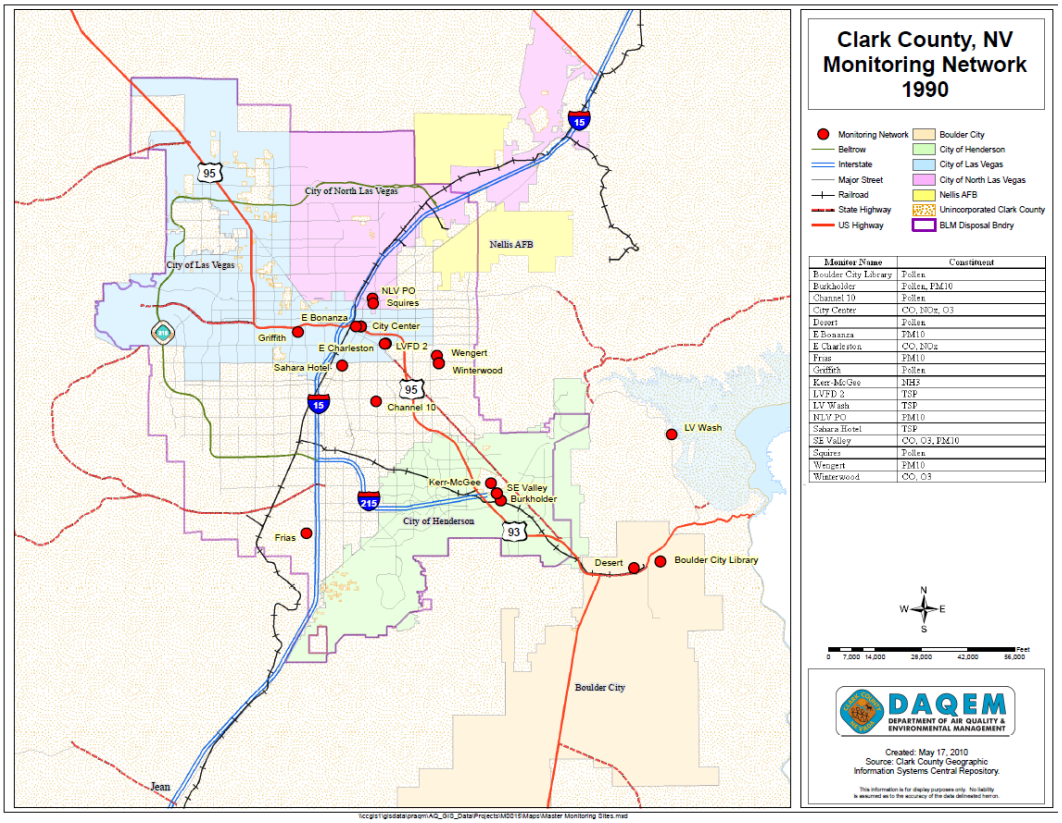
Clark County, NV
Monitoring Network
1990
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
Channel 10 | Pollen
City Center | CO, NOx, O3
Desert | Pollen
E Bonanza | PM10
E Charleston | CO, NOx
Frias | PM10
Griffith | Pollen
Kerr-McGee | NR3
LVFD 2 | TSP
LV Wash | TSP
NLV PO | PM10
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
Squires | Pollen
Wengert | PM10
Winterwood | CO, O3
City of North Las Vegas
City of Las Vegas
Nellis AFB
NLV PO
Squires
E Bonanza
City Center
Griffith
E Charleston
LVFD 2
Wengert
Winterwood
Sahara Hotel
Channel 10
LV Wash
Kerr-McGee
SE Valley
Burkholder
City of Henderson
Frias
Desert
Boulder City Library
Boulder City
Jean
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0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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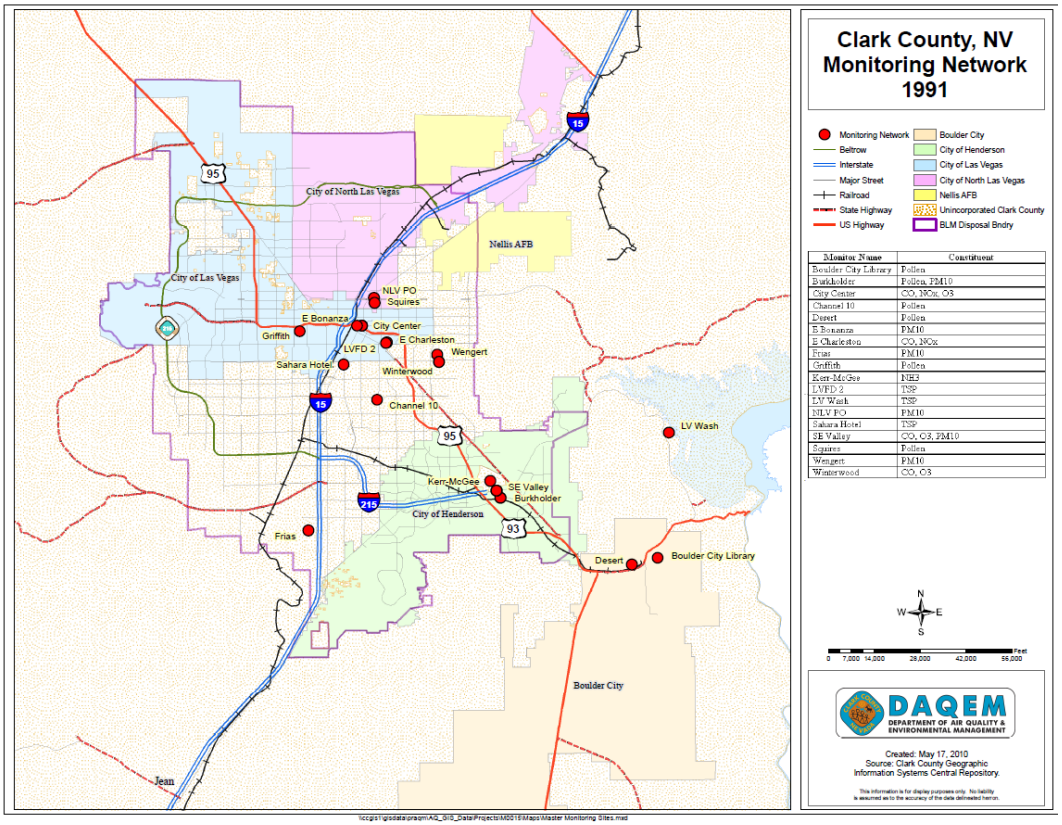
Clark County, NV
Monitoring Network
1991
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
City Center | CO, NOx, O3
Channel 10 | Pollen
Desert | Pollen
E Bonanza | PM10
E Charleston | CO, NOx
Frias | PM10
Griffith | Pollen
Kerr-McGee | NR3
LVFD 2 | TSP
LV Wash | TSP
NLV PO | PM10
Sahara Hotel | TSP
SE Valley | CO, O3, PM10
Squires | Pollen
Wengert | PM10
Winterwood | CO, O3
City of North Las Vegas
City of Las Vegas
Nellis AFB
NLV PO
Squires
E Bonanza
City Center
Griffith
E Charleston
LVFD 2
Wengert
Winterwood
Sahara Hotel
Channel 10
LV Wash
Kerr-McGee
SE Valley
Burkholder
City of Henderson
Frias
Desert
Boulder City Library
Boulder City
Jean
N
W
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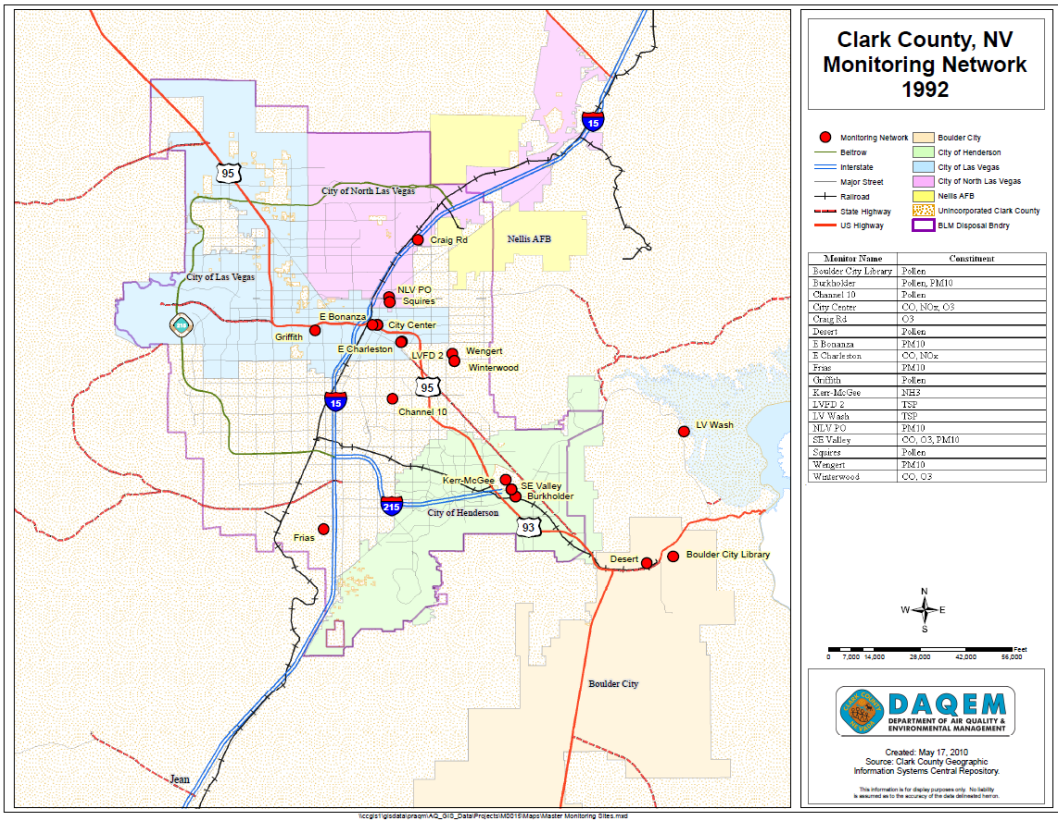
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.


Clark County, NV
Monitoring Network
1992
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
Channel 10 | Pollen
City Center | CO, NOx, O3
Craig Rd | O3
Desert | Pollen
E Bonanza | PM10
E Charleston | CO, NOx
Frias | PM10
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | TSP
LV Wash | TSP
NLV PO | PM10
SE Valley | CO, O3, PM10
Squires | Pollen
Wengert | PM10
Winterwood | CO, O3
City of North Las Vegas
Craig Rd
Nellis AFB
City of Las Vegas
NLV PO
Squires
E Bonanza
City Center
Griffith
E Charleston
LVFD 2
Wengert
Winterwood
Channel 10
LV Wash
Kerr-McGee
SE Valley
Burkholder
City of Henderson
Frias
Desert
Boulder City Library
Boulder City
Jean
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S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
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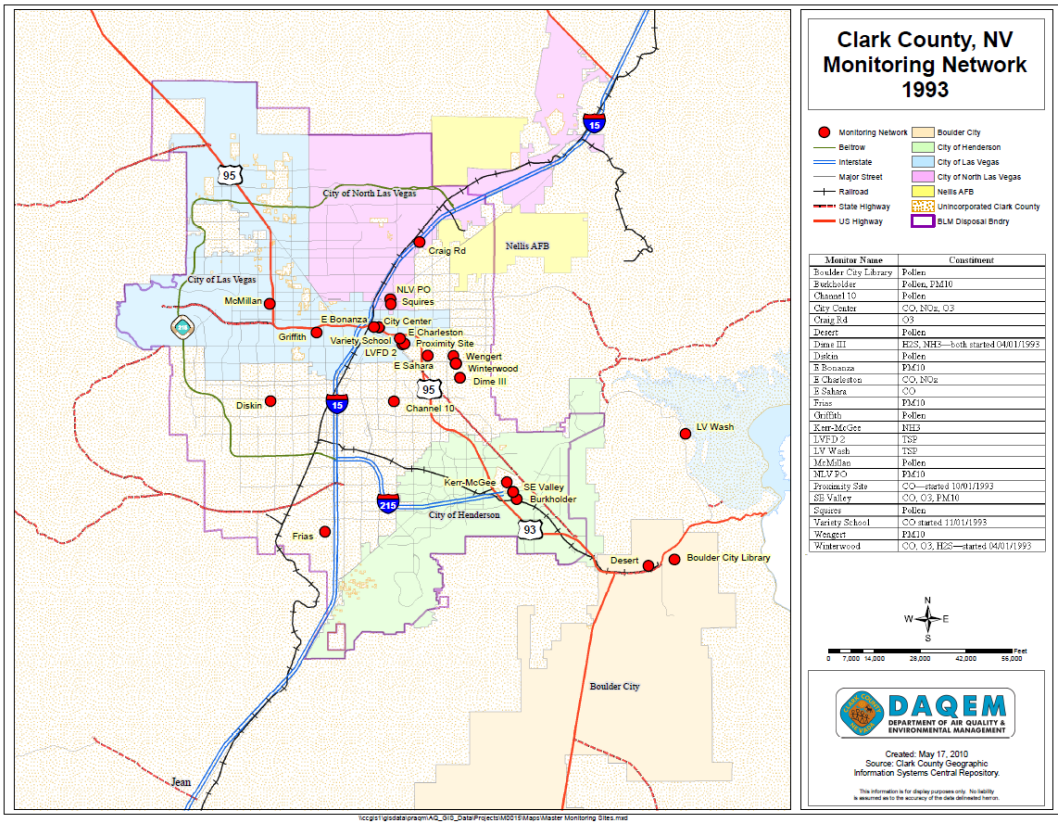
Clark County, NV
Monitoring Network
1993
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
Channel 10 | Pollen
City Center | CO, NOx, O3
Craig Rd | O3
Desert | Pollen
Dime III | H2S, MH3—both started 04/01/1993
Diskin | Pollen
E Bonanza | PM10
E Charleston | CO, NOx
E Sahara | CO
Frias | PM10
Griffith | Pollen
Kerr-McGee | NH3
LVFD 2 | TSP
LV Wash | TSP
McMillan | Pollen
NLV PO | PM10
Proximity Site | CO—started 10/01/1993
SE Valley | CO, O3, PM10
Squires | Pollen
Variety School | CO started 11/01/1993
Wengert | PM10
Winterwood | CO, O3, H2S—started 04/01/1993
City of North Las Vegas
Craig Rd
Nellis AFB
City of Las Vegas
McMillan
NLV PO
Squires
E Bonanza
City Center
Griffith
E Charleston
Variety School
Proximity Site
LVFD 2
E Sahara
Wengert
Winterwood
Dime III
Diskin
Channel 10
LV Wash
Kerr-McGee
SE Valley
Burkholder
City of Henderson
Frias
Desert
Boulder City Library
Boulder City
Jean
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0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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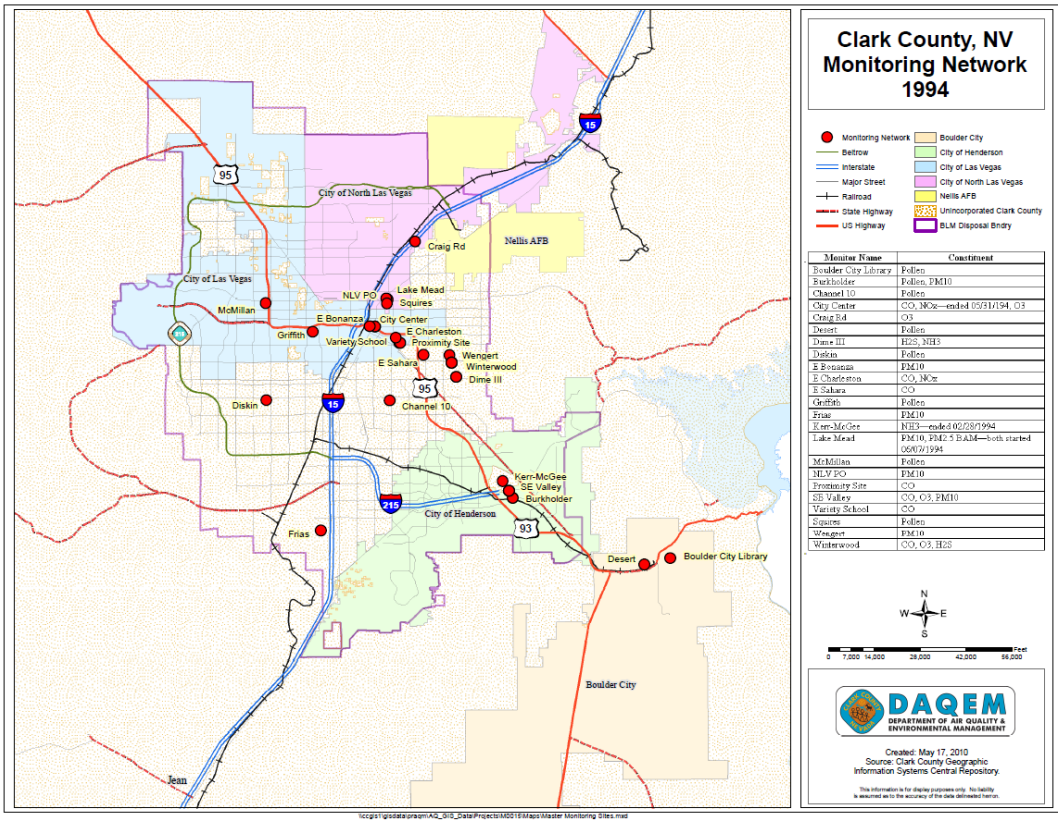
Clark County, NV
Monitoring Network
1994
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen, PM10
Channel 10 | Pollen
City Center | CO, NOx—ended 05/31/194, O3
Craig Rd | O3
Desert | Pollen
Dime III | H2S, NH3
Diskin | Pollen
E Bonanza | PM10
E Charleston | CO, NOx
E Sahara | CO
Griffith | Pollen
Frias | PM10
Kerr-McGee | NH3—ended 02/28/1994
Lake Mead | PM10, PM2.5 BAM—both started 06/07/1994
McMillan | Pollen
NLV PO | PM10
Proximity Site | CO
SE Valley | CO, O3, PM10
Variety School | CO
Squires | Pollen
Wengert | PM10
Winterwood | CO, O3, H2S
N
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E
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0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
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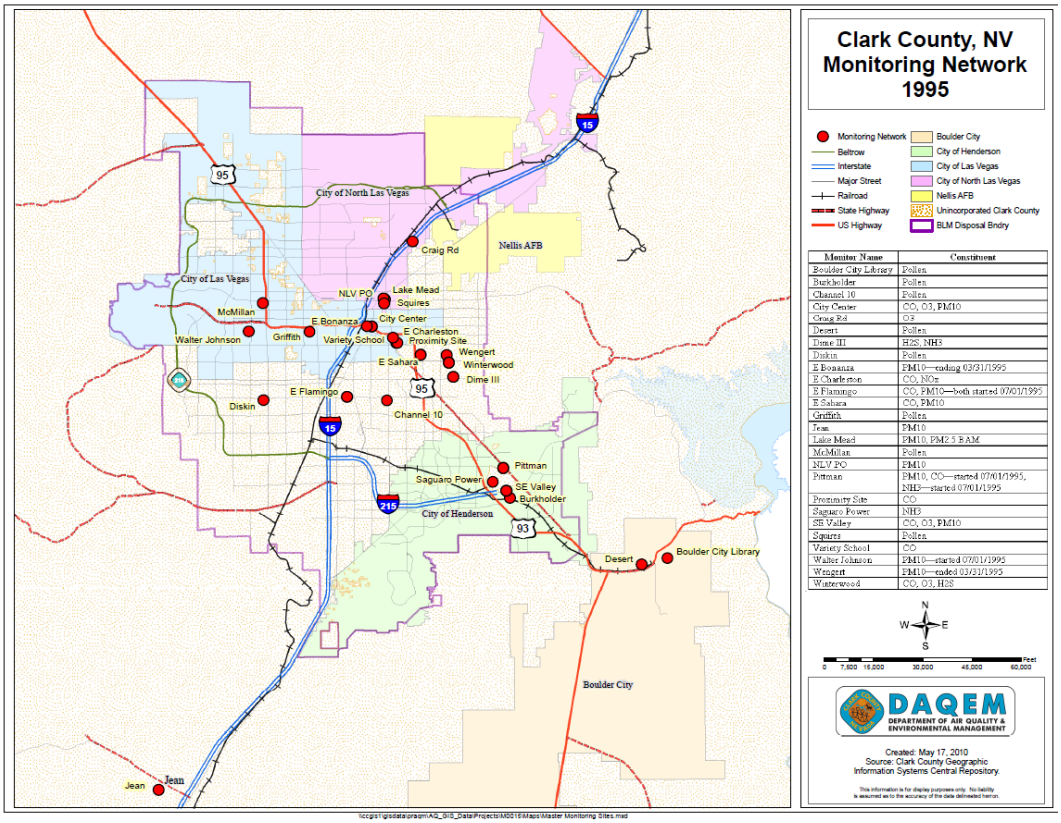
Clark County, NV
Monitoring Network
1995
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen
Channel 10 | Pollen
City Center | CO, O3, PM10
Craig Rd | O3
Desert | Pollen
Dime III | H2S, NH3
Diskin | Pollen
E Bonanza | PM10—ending 03/31/1995
E Charleston | CO, NOx
E Flamingo | CO, PM10—both started 07/01/1995
E Sahara | CO, PM10
Griffith | Pollen
Jean | PM10
Lake Mead | PM10, PM2.5 BAM
McMillan | Pollen
NLV PO | PM10
Pittman | PM10, CO—started 07/01/1995, NH3—started 07/01/1995
Proximity Site | CO
Saguaro Power | NH3
SE Valley | CO, O3, PM10
Squires | Pollen
Variety School | CO
Walter Johnson | PM10—started 07/01/1995
Wengert | PM10—ended 03/31/1995
Winterwood | CO, O3, H2S
N
W
E
S
0 7,500 15,000 30,000 45,000 60,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
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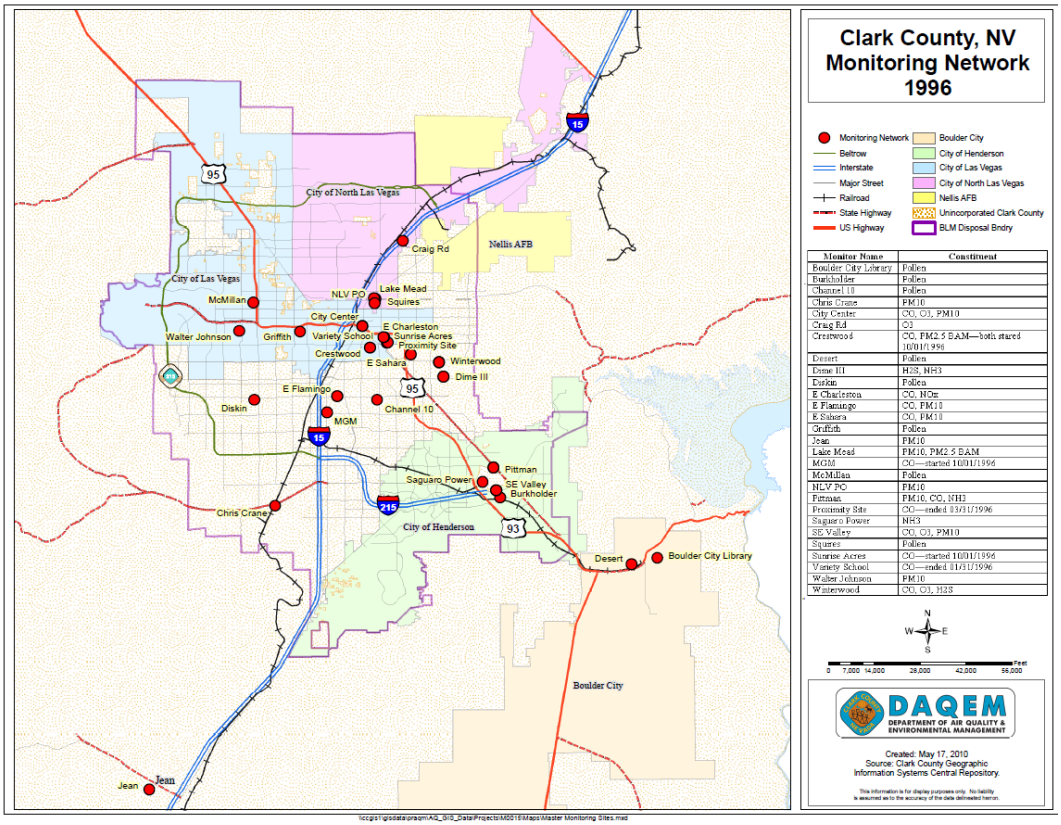
Clark County, NV
Monitoring Network
1996
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
Boulder City Library | Pollen
Burkholder | Pollen
Channel 10 | Pollen
Chris Crane | PM10
City Center | CO, O3, PM10
Craig Rd | O3
Crestwood | CO, PM2.5 BAM—both started 10/01/1996
Desert | Pollen
Dime III | H2S, NH3
Diskin | Pollen
E Charleston | CO, NOx
E Flamingo | CO, PM10
E Sahara | CO, PM10
Griffith | Pollen
Jean | PM10
Lake Mead | PM10, PM2.5 BAM
MGM | CO—started 10/01/1996
McMillan | Pollen
NLV PO | PM10
Pittman | PM10, CO, NH3
Proximity Site | CO—ended 03/31/1996
Saguaro Power | NH3
SE Valley | CO, O3, PM10
Squires | Pollen
Sunrise Acres | CO—started 10/01/1996
Variety School | CO—ended 03/31/1996
Walter Johnson | PM10
Winterwood | CO, O3, H2S
N
W
E
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
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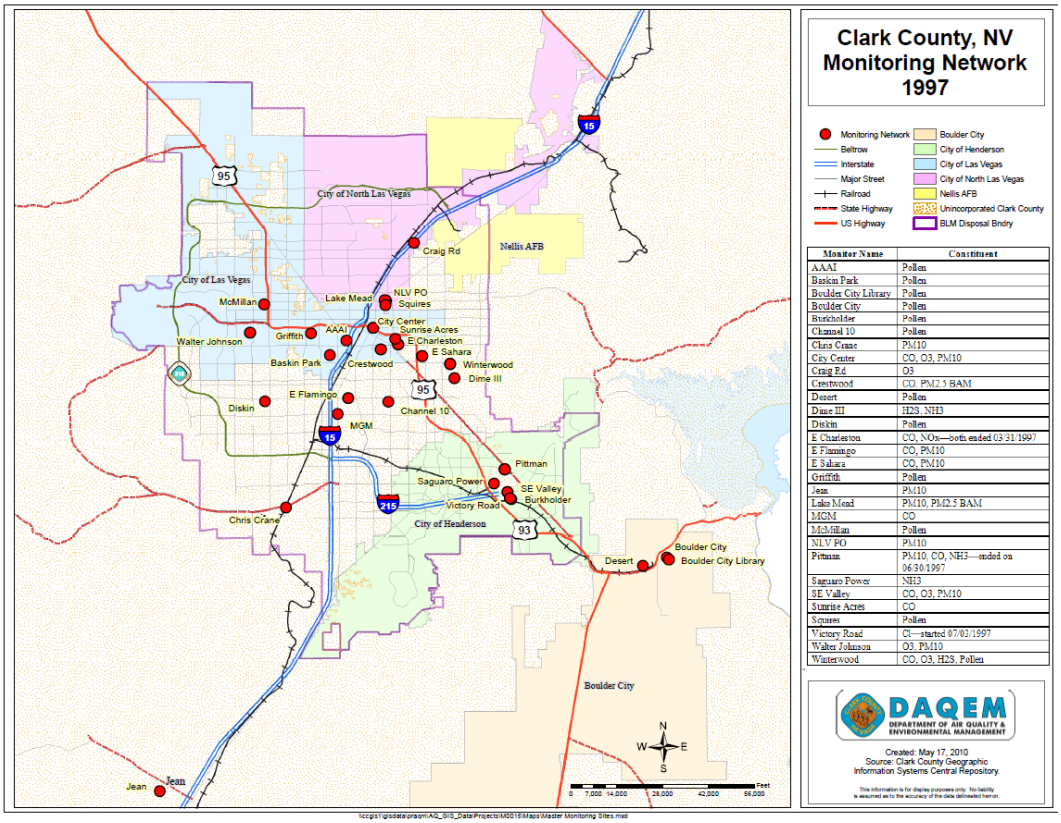
Clark County, NV
Monitoring Network
1997
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen
Baskin Park | Pollen
Boulder City Library | Pollen
Boulder City | Pollen
Burkholder | Pollen
Channel 10 | Pollen
Chris Crane | PM10
City Center | CO, O3, PM10
Craig Rd | O3
Crestwood | CO, PM2.5 BAM
Desert | Pollen
Dime III | H2S, NH3
Diskin | Pollen
E Charleston | CO, NOx—both ended 03/31/1997
E Flamingo | CO, PM10
E Sahara | CO, PM10
Griffith | Pollen
Jean | PM10
Lake Mead | PM10, PM2.5 BAM
MGM | CO
McMillan | Pollen
NLV PO | PM10
Pittman | PM10, CO, NH3—ended on 06/30/1997
Saguaro Power | NH3
SE Valley | CO, O3, PM10
Sunrise Acres | CO
Squires | Pollen
Victory Road | Cl—started 07/02/1997
Walter Johnson | O3, PM10
Winterwood | CO, O3, H2S, Pollen
N
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0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
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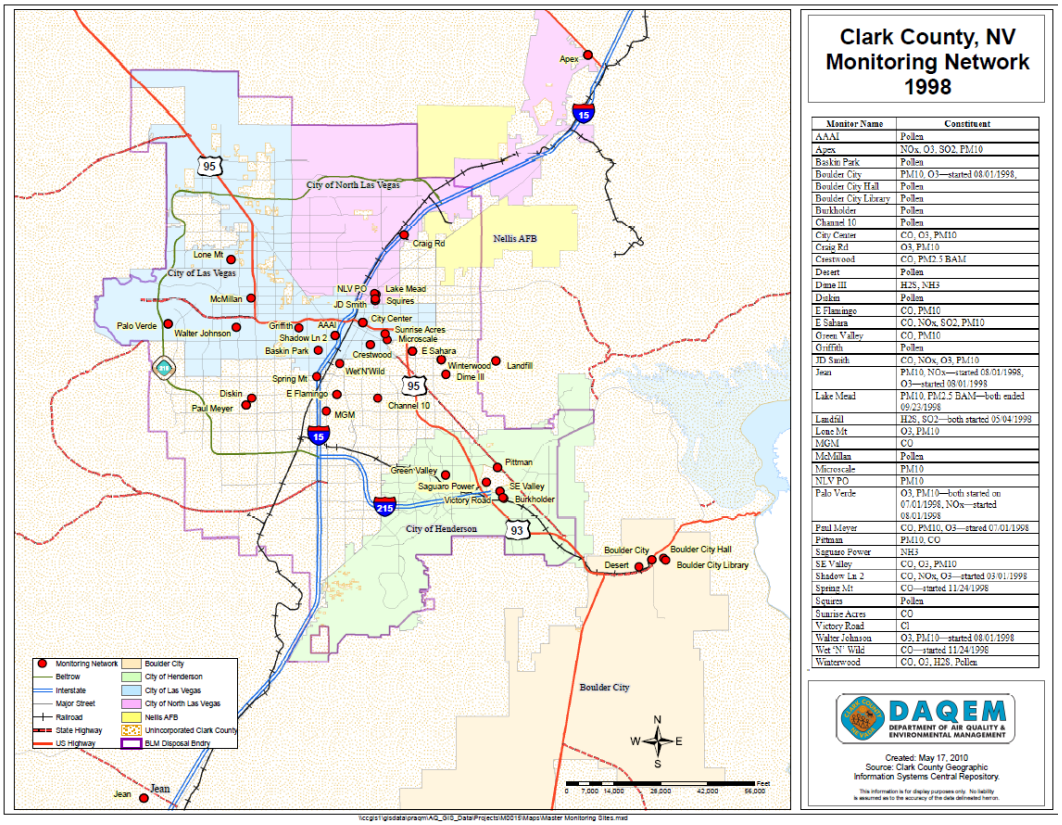

Clark County, NV Monitoring Network 1998

Monitor Name	Constituent
AAAI	Pollen
Apex	NOx, O3, SO2, PM10
Baskin Park	Pollen
Boulder City	PM10, O3—started 08/01/1998,
Boulder City Hall	Pollen
Boulder City Library	Pollen
Burkholder	Pollen
Channel 10	Pollen
City Center	CO, O3, PM10
Craig Rd	O3, PM10
Crestwood	CO, PM2.5 BAM
Desert	Pollen
Dime III	H2S, NH3
Diskin	Pollen
E Flamingo	CO, PM10
E Sahara	CO, NOx, SO2, PM10
Green Valley	CO, PM10
Griffith	Pollen
JD Smith	CO, NOx, O3, PM10
Jean	PM10, NOx—started 08/01/1998, O3—started 08/01/1998
Lake Mead	PM10, PM2.5 BAM—both ended 09/22/1998
Landfill	H2S, SO2—both started 05/04/1998
Lone Mt	O3, PM10
MGM	CO
McMillan	Pollen
Microscale	PM10
NLV PO	PM10
Palo Verde	O3, PM10—both started on 07/01/1998, NOx—started 08/01/1998
Paul Meyer	CO, PM10, O3—stared 07/01/1998
Pittman	PM10, CO
Saguaro Power	NH3
SE Valley	CO, O3, PM10
Shadow Ln 2	CO, NOx, O3—started 08/01/1998
Spring Mt	CO—started 11/24/1998
Squires	Pollen
Sunrise Acres	CO
Victory Road	Cl
Walter Johnson	O3, PM10—started 08/01/1998
Wet 'N' Wild	CO—started 11/24/1998
Winterwood	CO, O3, H2S, Pollen

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DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

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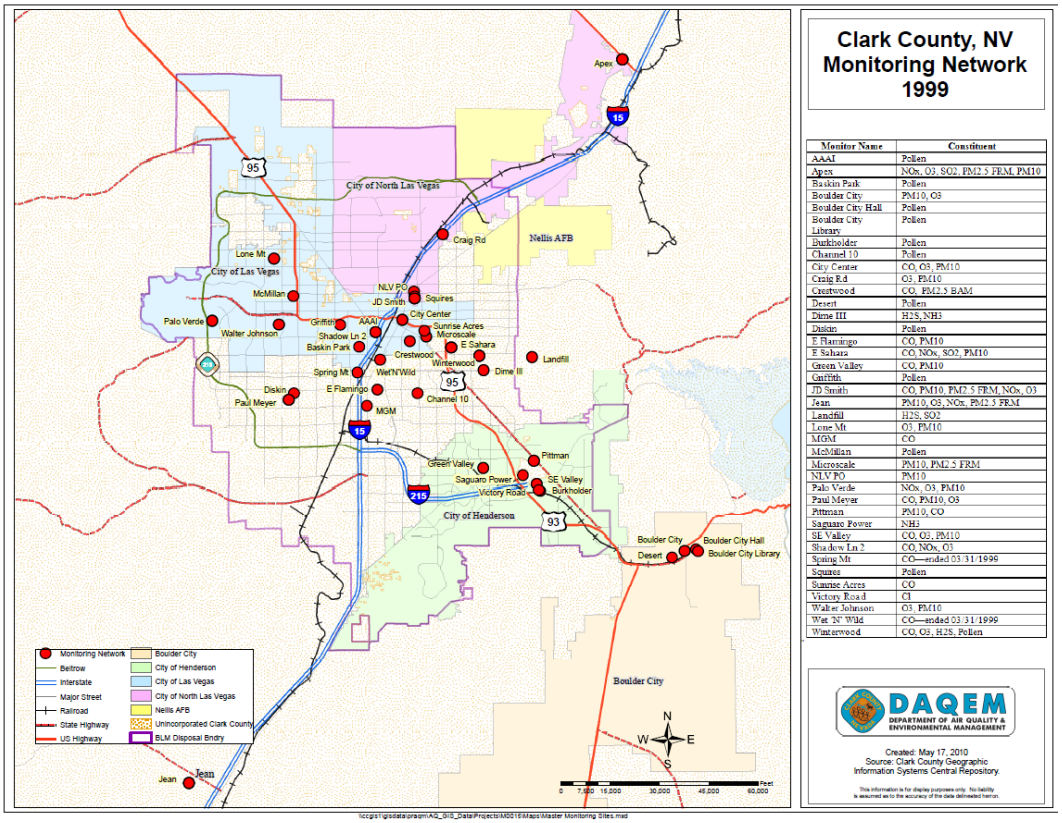

Clark County, NV Monitoring Network 1999

Monitor Name	Constituent
AAAI	Pollen
Apex	NOx, O3, SO2, PM2.5 FRM, PM10
Baskin Park	Pollen
Boulder City	PM10, O3
Boulder City Hall	Pollen
Boulder City Library	Pollen
Burkholder	Pollen
Channel 10	Pollen
City Center	CO, O3, PM10
Craig Rd	O3, PM10
Crestwood	CO, PM2.5 BAM
Desert	Pollen
Dime III	H2S, NH3
Diskin	Pollen
E Flamingo	CO, PM10
E Sahara	CO, NOx, SO2, PM10
Green Valley	CO, PM10
Griffith	Pollen
JD Smith	CO, PM10, PM2.5 FRM, NOx, O3
Jean	PM10, O3, NOx, PM2.5 FRM
Landfill	H2S, SO2
Lone Mt	O3, PM10
MGM	CO
McMillan	Pollen
Microscale	PM10, PM2.5 FRM
NLV PO	PM10
Palo Verde	NOx, O3, PM10
Paul Meyer	CO, PM10, O3
Pittman	PM10, CO
Saguaro Power	NH3
SE Valley	CO, O3, PM10
Shadow Ln 2	CO, NOx, O3
Spring Mt	CO—ended 03/31/1999
Squires	Pollen
Sunrise Acres	CO
Victory Road	Cl
Walter Johnson	O3, PM10
Wet 'N' Wild	CO—ended 03/31/1999
Winterwood	CO, O3, H2S, Pollen

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DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

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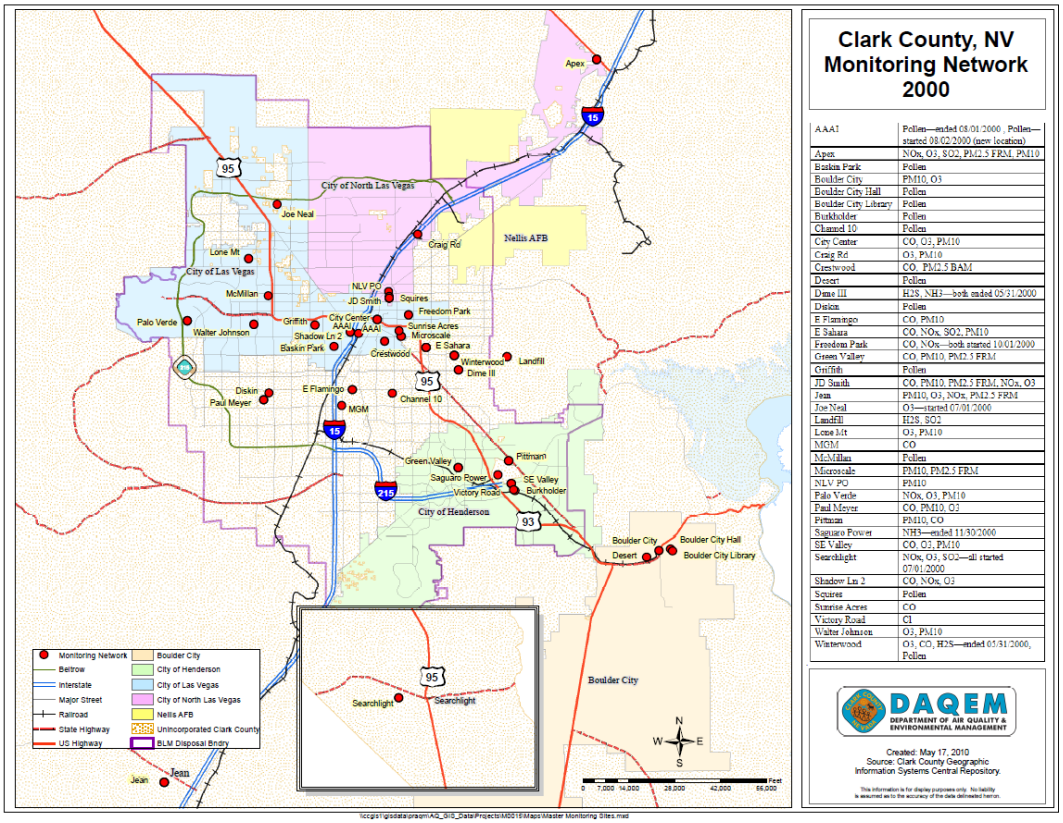

Clark County, NV Monitoring Network 2000

AAAI	Pollen—ended 08/01/2000 ; Pollen—started 08/02/2000 (new location)
Apex	NOx, O3, SO2, PM2.5 FRM, PM10
Baskin Park	Pollen
Boulder City	PM10, O3
Boulder City Hall	Pollen
Boulder City Library	Pollen
Burkholder	Pollen
Channel 10	Pollen
City Center	CO, O3, PM10
Craig Rd	O3, PM10
Crestwood	CO, PM2.5 BAM
Desert	Pollen
Dime III	H2S, NH3—both ended 05/31/2000
Diskin	Pollen
E Flamingo	CO, PM10
E Sahara	CO, NOx, SO2, PM10
Freedom Park	CO, NOx—both started 10/01/2000
Green Valley	CO, PM10, PM2.5 FRM
Griffith	Pollen
JD Smith	CO, PM10, PM2.5 FRM, NOx, O3
Jean	PM10, O3, NOx, PM2.5 FRM
Joe Neal	O3—started 07/01/2000
Landfill	H2S, SO2
Lone Mt	O3, PM10
MGM	CO
McMillan	Pollen
Microscale	PM10, PM2.5 FRM
NLV PO	PM10
Palo Verde	NOx, O3, PM10
Paul Meyer	CO, PM10, O3
Pittman	PM10, CO
Saguaro Power	NH3—ended 11/30/2000
SE Valley	CO, O3, PM10
Searchlight	NOx, O3, SO2—all started 07/01/2000
Shadow Ln 2	CO, NOx, O3
Squires	Pollen
Sunrise Acres	CO
Victory Road	Cl
Walter Johnson	O3, PM10
Winterwood	O3, CO, H2S—ended 05/31/2000, Pollen

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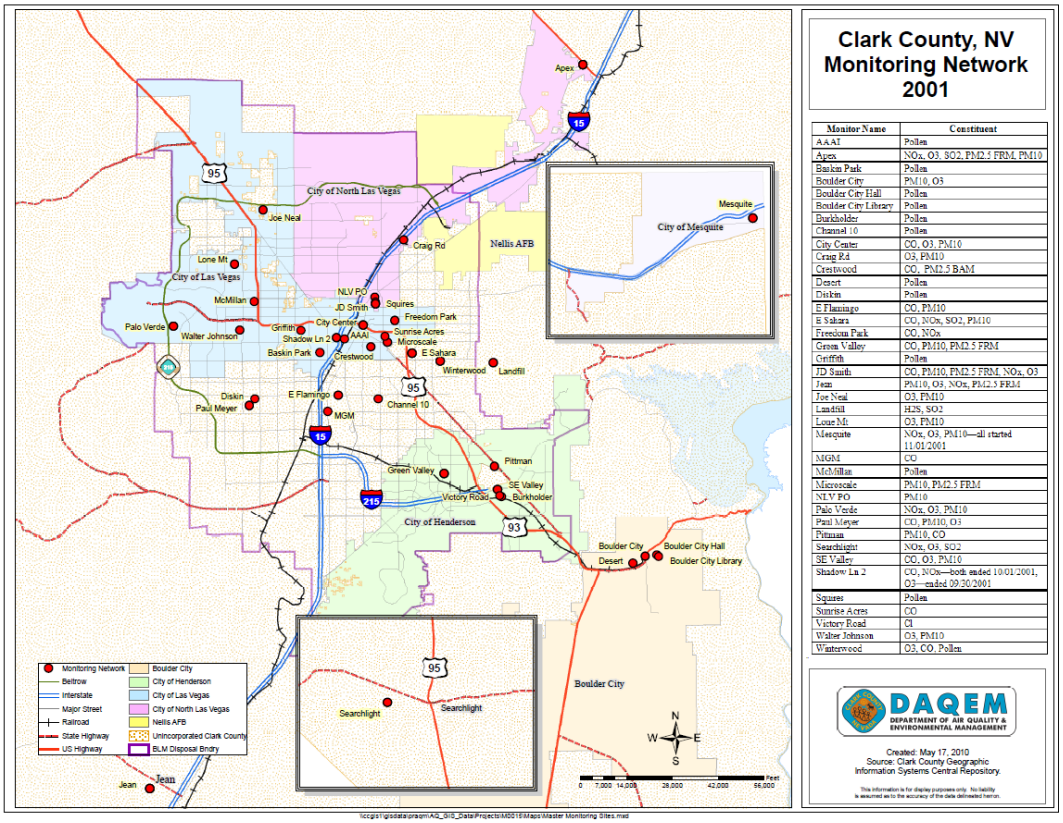

Clark County, NV Monitoring Network 2001

Monitor Name	Constituent
AAAI	Pollen
Apex	NOx, O3, SO2, PM2.5 FRM, PM10
Baskin Park	Pollen
Boulder City	PM10, O3
Boulder City Hall	Pollen
Boulder City Library	Pollen
Burkholder	Pollen
Channel 10	Pollen
City Center	CO, O3, PM10
Craig Rd	O3, PM10
Crestwood	CO, PM2.5 BAM
Desert	Pollen
Diskin	Pollen
E Flamingo	CO, PM10
E Sahara	CO, NOx, SO2, PM10
Freedom Park	CO, NOx
Green Valley	CO, PM10, PM2.5 FRM
Griffith	Pollen
JD Smith	CO, PM10, PM2.5 FRM, NOx, O3
Jean	PM10, O3, NOx, PM2.5 FRM
Joe Neal	O3, PM10
Landfill	H2S, SO2
Lone Mt	O3, PM10
Mesquite	NOx, O3, PM10—all started 11/01/2001
MGM	CO
McMillan	Pollen
Microscale	PM10, PM2.5 FRM
NLV PO	PM10
Palo Verde	NOx, O3, PM10
Paul Meyer	CO, PM10, O3
Pittman	PM10, CO
Searchlight	NOx, O3, SO2
SE Valley	CO, O3, PM10
Shadow Ln 2	CO, NOx—both ended 10/01/2001, O3—ended 09/30/2001
Squires	Pollen
Sunrise Acres	CO
Victory Road	Cl
Walter Johnson	O3, PM10
Winterwood	O3, CO, Pollen

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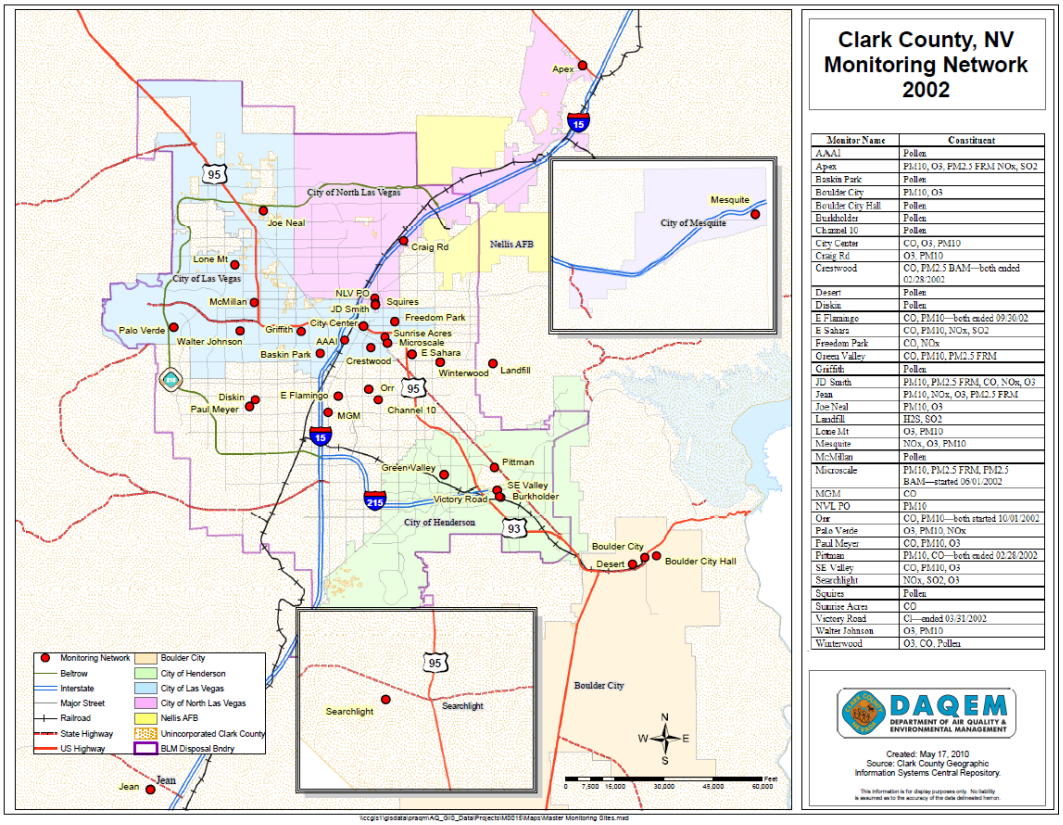
Clark County, NV
Monitoring Network
2002
Monitor Name | Constituent
AAAI | Pollen
Apex | PM10, O3, PM2.5 FRM NOx, SO2
Baskin Park | Pollen
Boulder City | PM10, O3
Boulder City Hall | Pollen
Burkholder | Pollen
Channel 10 | Pollen
City Center | CO, O3, PM10
Craig Rd | O3, PM10
Crestwood | CO, PM2.5 BAM—both ended 02/28/2002
Desert | Pollen
Diskin | Pollen
E Flamingo | CO, PM10—both ended 09/30/02
E Sahara | CO, PM10, NOx, SO2
Freedom Park | CO, NOx
Green Valley | CO, PM10, PM2.5 FRM
Griffith | Pollen
JD Smith | PM10, PM2.5 FRM, CO, NOx, O3
Jean | PM10, NOx, O3, PM2.5 FRM
Joe Neal | PM10, O3
Landfill | H2S, SO2
Lone Mt | O3, PM10
Mesquite | NOx, O3, PM10
McMillan | Pollen
Microscale | PM10, PM2.5 FRM, PM2.5 BAM—started 06/01/2002
MGM | CO
NVL PO | PM10
Orr | CO, PM10—both started 10/01/2002
Palo Verde | O3, PM10, NOx
Paul Meyer | CO, PM10, O3
Pittman | PM10, CO—both ended 02/28/2002
SE Valley | CO, PM10, O3
Searchlight | NOx, SO2, O3
Squires | Pollen
Sunrise Acres | CO
Victory Road | CO—ended 03/31/2002
Walter Johnson | O3, PM10
Winterwood | O3, CO, Pollen
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Apex
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Mesquite
City of Mesquite
Lone Mt
City of Las Vegas
McMillan
NLV PO
Squires
JD Smith
Freedom Park
City Center
Griffith
Sunrise Acres
Microscale
Palo Verde
Walter Johnson
AAAI
Baskin Park
E Sahara
Crestwood
Winterwood
Landfill
Orr
Diskin
Paul Meyer
E Flamingo
MGM
Channel 10
Green Valley
Pittman
SE Valley
Burkholder
Victory Road
City of Henderson
Boulder City
Desert
Boulder City Hall
Searchlight
Jean
N
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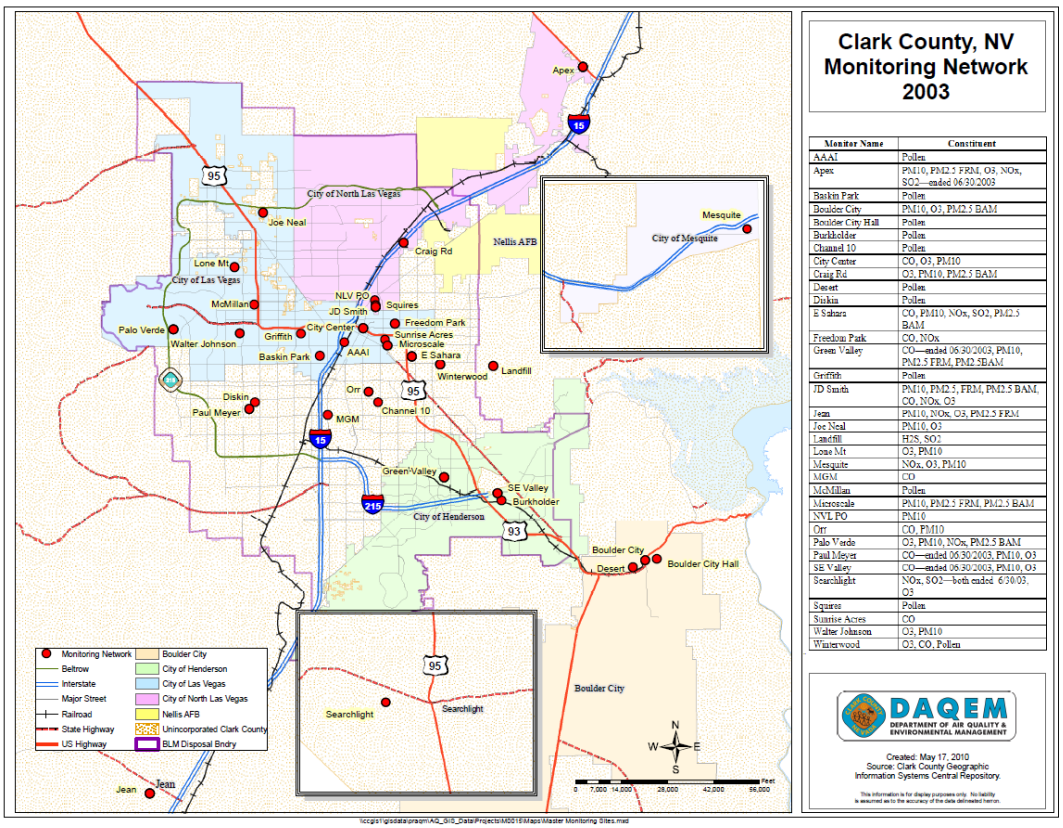
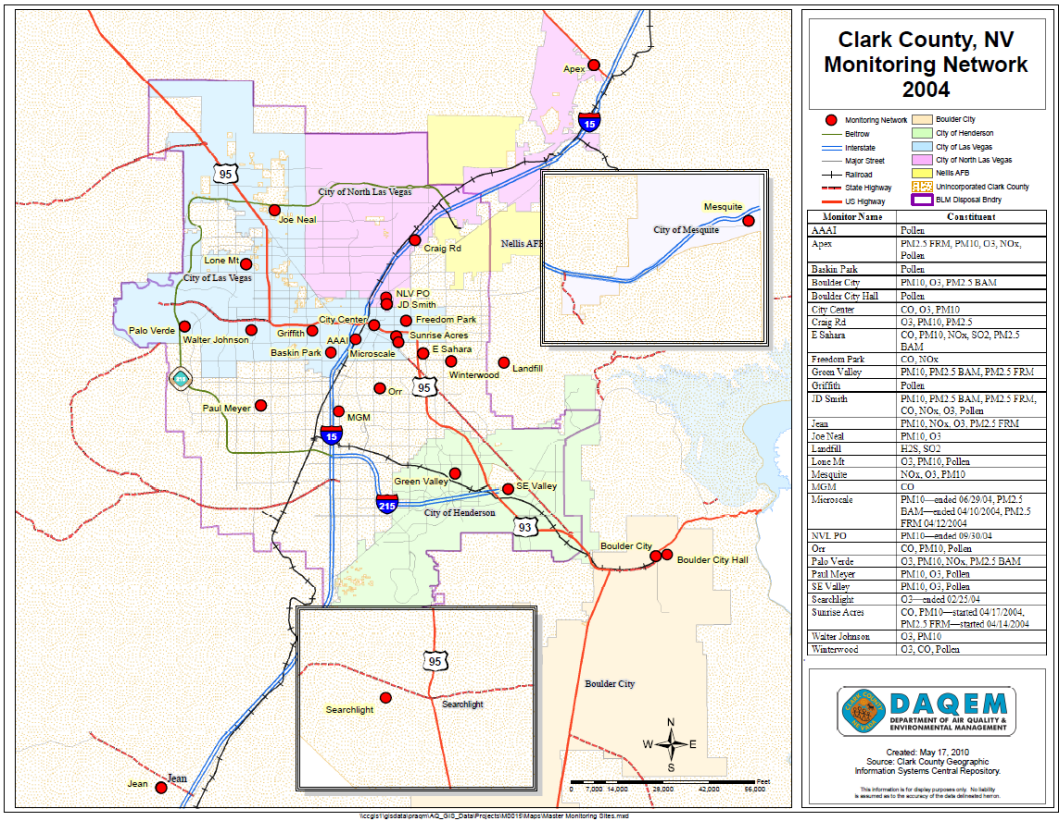
Feet


Clark County, NV
Monitoring Network
2003
Monitor Name | Constituent
AAAI | Pollen
Apex | PM10, PM2.5 FRM, O3, NOx, SO2—ended 06/30/2003
Baskin Park | Pollen
Boulder City | PM10, O3, PM2.5 BAM
Boulder City Hall | Pollen
Burkholder | Pollen
Channel 10 | Pollen
City Center | CO, O3, PM10
Craig Rd | O3, PM10, PM2.5 BAM
Desert | Pollen
Diskin | Pollen
E Sahara | CO, PM10, NOx, SO2, PM2.5 BAM
Freedom Park | CO, NOx
Green Valley | CO—ended 06/30/2003, PM10, PM2.5 FRM, PM2.5BAM
Griffith | Pollen
JD Smith | PM10, PM2.5, FRM, PM2.5 BAM, CO, NOx, O3
Jean | PM10, NOx, O3, PM2.5 FRM
Joe Neal | PM10, O3
Landfill | H2S, SO2
Lone Mt | O3, PM10
Mesquite | NOx, O3, PM10
MGM | CO
McMillan | Pollen
Microscale | PM10, PM2.5 FRM, PM2.5 BAM
NVL PO | PM10
Orr | CO, PM10
Palo Verde | O3, PM10, NOx, PM2.5 BAM
Paul Meyer | CO—ended 06/30/2003, PM10, O3
SE Valley | CO—ended 06/30/2003, PM10, O3
Searchlight | NOx, SO2—both ended 6/30/03, O3
Squires | Pollen
Sunrise Acres | CO
Walter Johnson | O3, PM10
Winterwood | O3, CO, Pollen
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Apex
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Mesquite
City of Mesquite
Lone Mt
City of Las Vegas
McMillan
NLV PO
Squires
JD Smith
Freedom Park
City Center
Griffith
Sunrise Acres
Microscale
Palo Verde
Walter Johnson
AAAI
Baskin Park
E Sahara
Winterwood
Landfill
Orr
Diskin
Paul Meyer
Channel 10
MGM
Green Valley
SE Valley
Burkholder
City of Henderson
Boulder City
Desert
Boulder City Hall
Searchlight
Jean
N
W
E
S
Feet


Clark County, NV
Monitoring Network
2004
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen
Apex | PM2.5 FRM, PM10, O3, NOx, Pollen
Baskin Park | Pollen
Boulder City | PM10, O3, PM2.5 BAM
Boulder City Hall | Pollen
City Center | CO, O3, PM10
Craig Rd | O3, PM10, PM2.5
E Sahara | CO, PM10, NOx, SO2, PM2.5 BAM
Freedom Park | CO, NOx
Green Valley | PM10, PM2.5 BAM, PM2.5 FRM
Griffith | Pollen
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, NOx, O3, PM2.5 FRM
Joe Neal | PM10, O3
Landfill | H2S, SO2
Lone Mt | O3, PM10, Pollen
Mesquite | NOx, O3, PM10
MGM | CO
Microscale | PM10—ended 06/29/04, PM2.5 BAM—ended 04/10/2004, PM2.5 FRM 04/12/2004
NVL PO | PM10—ended 09/30/04
Orr | CO, PM10, Pollen
Palo Verde | O3, PM10, NOx, PM2.5 BAM
Paul Meyer | PM10, O3, Pollen
SE Valley | PM10, O3, Pollen
Searchlight | O2—ended 02/25/04
Sunrise Acres | CO, PM10—started 04/17/2004, PM2.5 FRM—started 04/14/2004
Walter Johnson | O3, PM10
Winterwood | O3, CO, Pollen
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
Apex
Mesquite
City of Mesquite
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Lone Mt
City of Las Vegas
NLV PO
JD Smith
Freedom Park
City Center
Palo Verde
Walter Johnson
Griffith
AAAI
Sunrise Acres
Baskin Park
Microscale
E Sahara
Winterwood
Landfill
Orr
Paul Meyer
MGM
Green Valley
SE Valley
City of Henderson
Boulder City
Boulder City Hall
Searchlight
Jean
N
W
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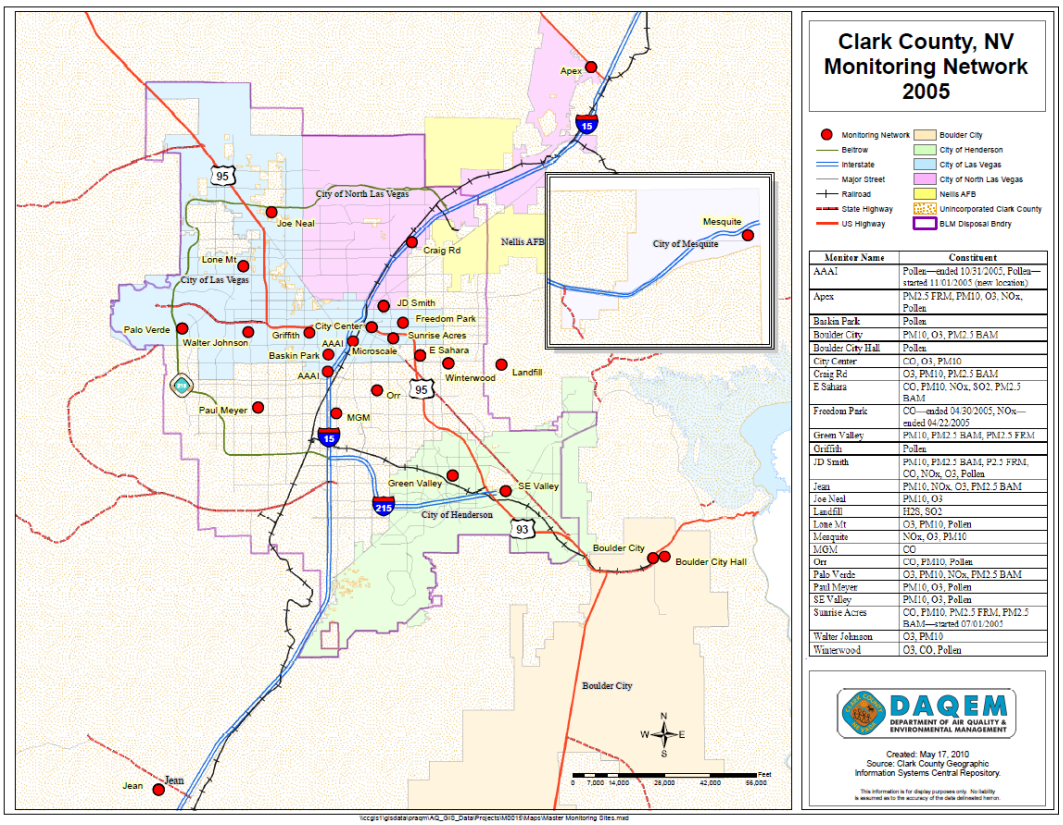
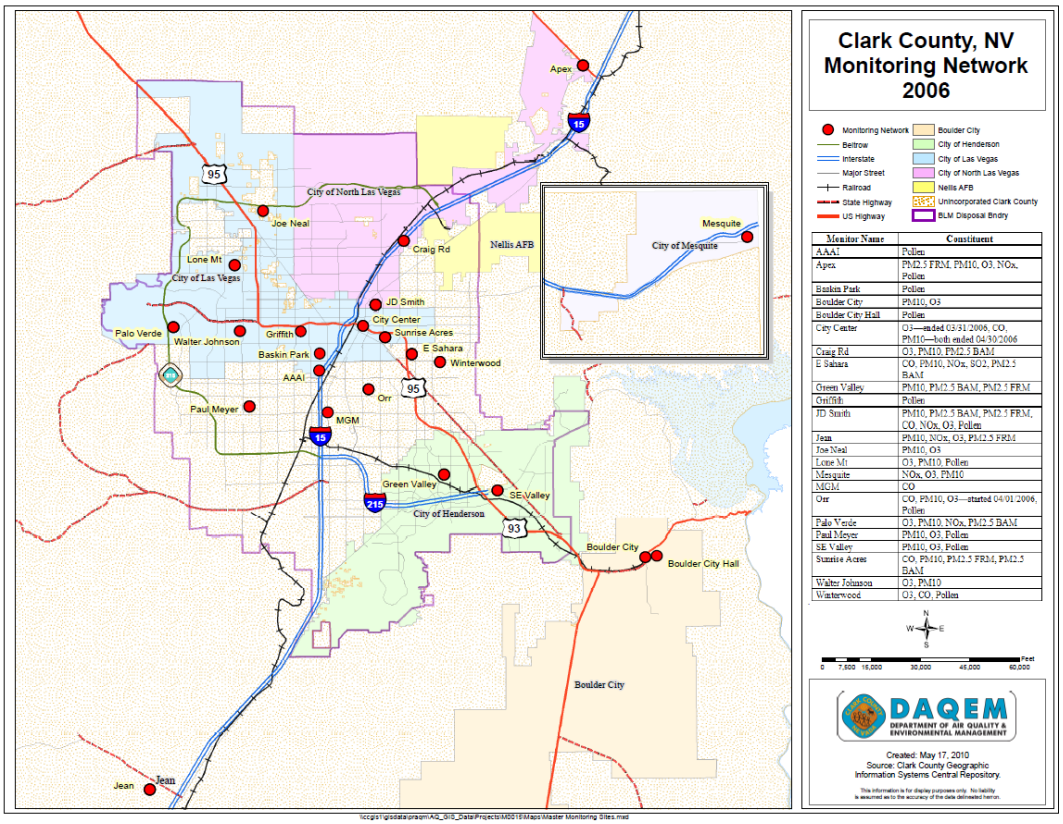
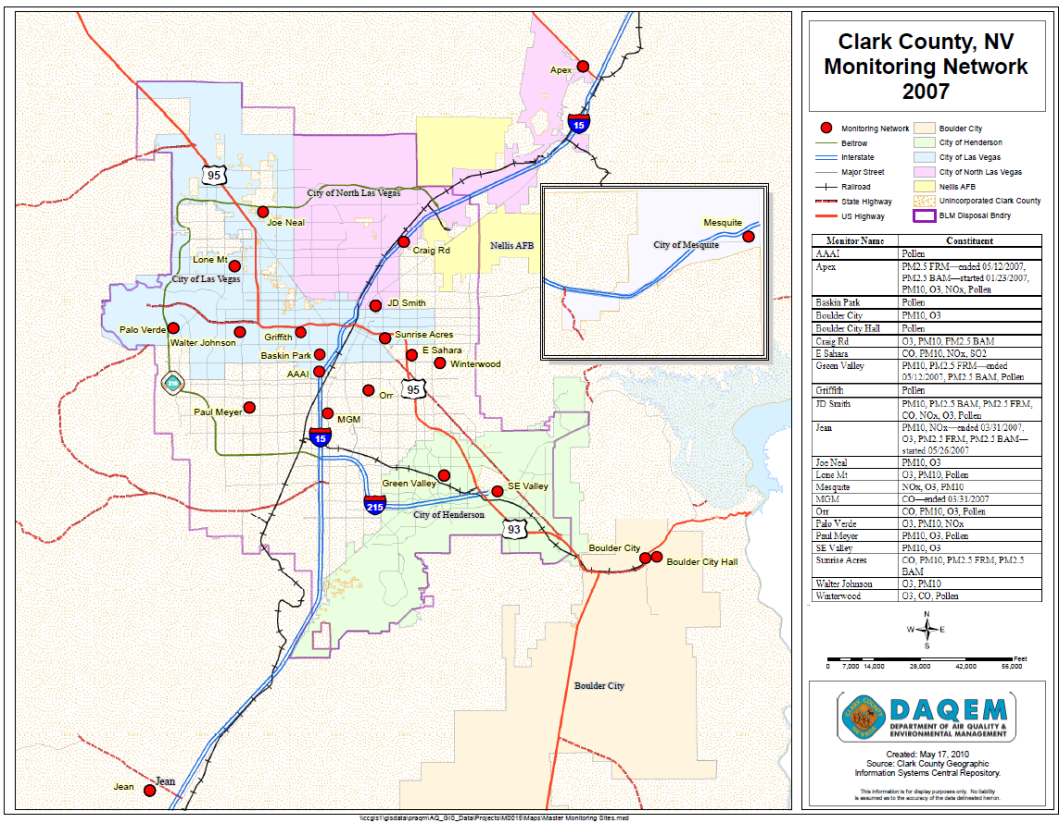
S
Feet


Clark County, NV
Monitoring Network
2005
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen—ended 10/31/2005, Pollen—started 11/01/2005 (new location)
Apex | PM2.5 FRM, PM10, O3, NOx, Pollen
Baskin Park | Pollen
Boulder City | PM10, O3, PM2.5 BAM
Boulder City Hall | Pollen
City Center | CO, O3, PM10
Craig Rd | O3, PM10, PM2.5 BAM
E Sahara | CO, PM10, NOx, SO2, PM2.5 BAM
Freedom Park | CO—ended 04/30/2005, NOx—ended 04/22/2005
Green Valley | PM10, PM2.5 BAM, PM2.5 FRM
Griffith | Pollen
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, NOx, O3, PM2.5 BAM
Joe Neal | PM10, O3
Landfill | H2S, SO2
Lone Mt | O3, PM10, Pollen
Mesquite | NOx, O3, PM10
MGM | CO
Orr | CO, PM10, Pollen
Palo Verde | O3, PM10, NOx, PM2.5 BAM
Paul Meyer | PM10, O3, Pollen
SE Valley | PM10, O3, Pollen
Sunrise Acres | CO, PM10, PM2.5 FRM, PM2.5 BAM—started 07/01/2005
Walter Johnson | O3, PM10
Winterwood | O3, CO, Pollen
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
Apex
Mesquite
City of Mesquite
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Lone Mt
City of Las Vegas
JD Smith
Freedom Park
Palo Verde
Walter Johnson
Griffith
City Center
AAAI
Sunrise Acres
Baskin Park
Microscale
E Sahara
Winterwood
Landfill
Orr
Paul Meyer
MGM
Green Valley
SE Valley
City of Henderson
Boulder City
Boulder City Hall
Jean
N
W
E
S
Feet


Clark County, NV
Monitoring Network
2006
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen
Apex | PM2.5 FRM, PM10, O3, NOx, Pollen
Baskin Park | Pollen
Boulder City | PM10, O3
Boulder City Hall | Pollen
City Center | O3—ended 03/31/2006, CO, PM10—both ended 04/30/2006
Craig Rd | O3, PM10, PM2.5 BAM
E Sahara | CO, PM10, NOx, SO2, PM2.5 BAM
Green Valley | PM10, PM2.5 BAM, PM2.5 FRM
Griffith | Pollen
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, NOx, O3, PM2.5 FRM
Joe Neal | PM10, O3
Lone Mt | O3, PM10, Pollen
Mesquite | NOx, O3, PM10
MGM | CO
Orr | CO, PM10, O3—started 04/01/2006, Pollen
Palo Verde | O3, PM10, NOx, PM2.5 BAM
Paul Meyer | PM10, O3, Pollen
SE Valley | PM10, O3, Pollen
Sunrise Acres | CO, PM10, PM2.5 FRM, PM2.5 BAM
Walter Johnson | O3, PM10
Winterwood | O3, CO, Pollen
N
W
E
S
0 7,500 15,000 30,000 45,000 60,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.
\\ccgis1\gisdata\prjagm\AQ_GIS_Data\Projects\M0018\Maps\Master Monitoring Sites.mxd
Apex
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Mesquite
City of Mesquite
Lone Mt
City of Las Vegas
JD Smith
City Center
Palo Verde
Walter Johnson
Griffith
Sunrise Acres
Baskin Park
E Sahara
Winterwood
AAAI
Orr
Paul Meyer
MGM
Green Valley
SE Valley
City of Henderson
Boulder City
Boulder City Hall
Jean
95
15
215
93


Clark County, NV
Monitoring Network
2007
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen
Apex | PM2.5 FRM—ended 05/12/2007, PM2.5 BAM—started 01/25/2007, PM10, O3, NOx, Pollen
Baskin Park | Pollen
Boulder City | PM10, O3
Boulder City Hall | Pollen
Craig Rd | O3, PM10, PM2.5 BAM
E Sahara | CO, PM10, NOx, SO2
Green Valley | PM10, PM2.5 FRM—ended 05/12/2007, PM2.5 BAM, Pollen
Griffith | Pollen
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, NOx—ended 03/31/2007, O3, PM2.5 FRM, PM2.5 BAM—started 05/26/2007
Joe Neal | PM10, O3
Lone Mt | O3, PM10, Pollen
Mesquite | NOx, O3, PM10
MGM | CO—ended 03/31/2007
Orr | CO, PM10, O3, Pollen
Palo Verde | O3, PM10, NOx
Paul Meyer | PM10, O3, Pollen
SE Valley | PM10, O3
Sunrise Acres | CO, PM10, PM2.5 FRM, PM2.5 BAM
Walter Johnson | O3, PM10
Winterwood | O3, CO, Pollen
N
W
E
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.
This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.
\\ccgis1\gisdata\prjagm\AQ_GIS_Data\Projects\M0018\Maps\Master Monitoring Sites.mxd
Apex
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Mesquite
City of Mesquite
Lone Mt
City of Las Vegas
JD Smith
Palo Verde
Walter Johnson
Griffith
Sunrise Acres
Baskin Park
E Sahara
Winterwood
AAAI
Orr
Paul Meyer
MGM
Green Valley
SE Valley
City of Henderson
Boulder City
Boulder City Hall
Jean
95
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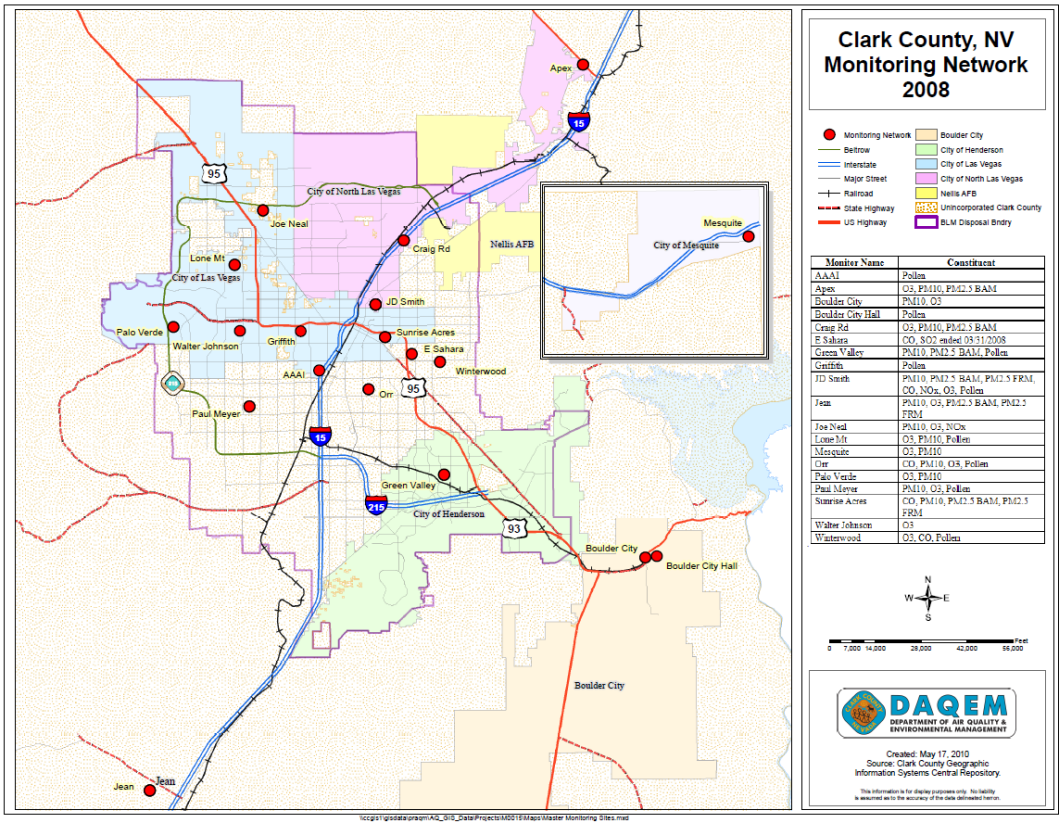
93


Clark County, NV
Monitoring Network
2008
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Moniter Name | Constituent
AAAI | Pollen
Apex | O3, PM10, PM2.5 BAM
Boulder City | PM10, O3
Boulder City Hall | Pollen
Craig Rd | O3, PM10, PM2.5 BAM
E Sahara | CO, SO2 ended 03/31/2008
Green Valley | PM10, PM2.5 BAM, Pollen
Griffith | Pollen
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, O3, PM2.5 BAM, PM2.5 FRM
Joe Neal | PM10, O3, NOx
Lone Mt | O3, PM10, Pollen
Mesquite | O3, PM10
Orr | CO, PM10, O3, Pollen
Palo Verde | O3, PM10
Paul Meyer | PM10, O3, Pollen
Sunrise Acres | CO, PM10, PM2.5 BAM, PM2.5 FRM
Walter Johnson | O3
Winterwood | O3, CO, Pollen
Apex
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Mesquite
City of Mesquite
Lone Mt
City of Las Vegas
JD Smith
Palo Verde
Walter Johnson
Griffith
Sunrise Acres
E Sahara
Winterwood
AAAI
Orr
Paul Meyer
Green Valley
City of Henderson
Boulder City
Boulder City Hall
Jean
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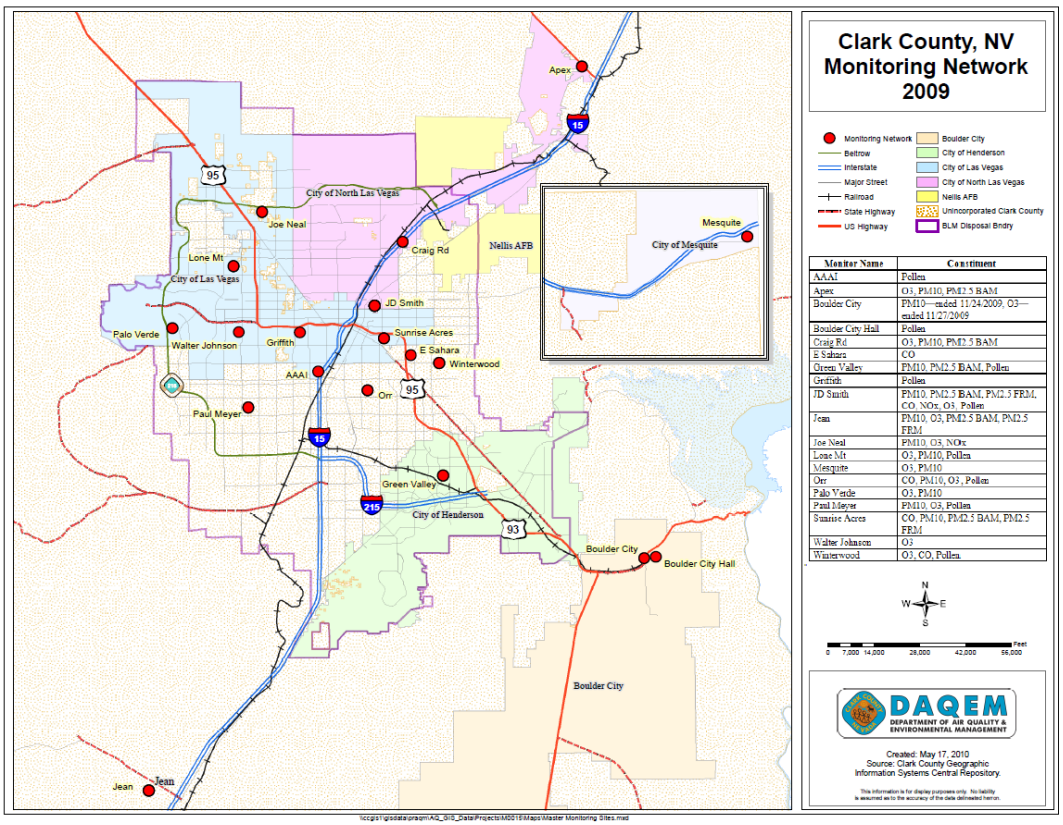
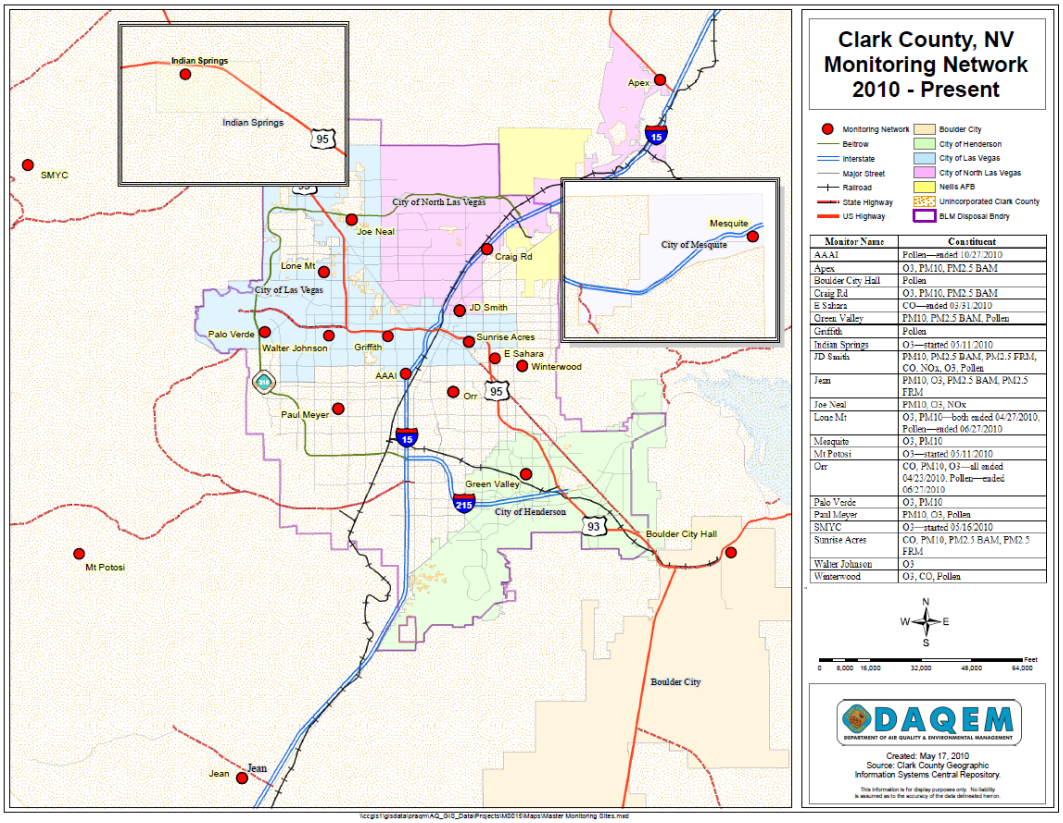
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.


Clark County, NV
Monitoring Network
2009
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen
Apex | O3, PM10, PM2.5 BAM
Boulder City | PM10—ended 11/24/2009, O3—ended 11/27/2009
Boulder City Hall | Pollen
Craig Rd | O3, PM10, PM2.5 BAM
E Sahara | CO
Green Valley | PM10, PM2.5 BAM, Pollen
Griffith | Pollen
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, O3, PM2.5 BAM, PM2.5 FRM
Joe Neal | PM10, O3, NOx
Lone Mt | O3, PM10, Pollen
Mesquite | O3, PM10
Orr | CO, PM10, O3, Pollen
Palo Verde | O3, PM10
Paul Meyer | PM10, O3, Pollen
Sunrise Acres | CO, PM10, PM2.5 BAM, PM2.5 FRM
Walter Johnson | O3
Winterwood | O3, CO, Pollen
Apex
City of North Las Vegas
Joe Neal
Craig Rd
Nellis AFB
Mesquite
City of Mesquite
Lone Mt
City of Las Vegas
JD Smith
Palo Verde
Walter Johnson
Griffith
Sunrise Acres
E Sahara
Winterwood
AAAI
Orr
Paul Meyer
Green Valley
City of Henderson
Boulder City
Boulder City Hall
Jean
N
W
E
S
0 7,000 14,000 28,000 42,000 56,000 Feet
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository.


Clark County, NV
Monitoring Network
2010 - Present
Monitoring Network
Beltrow
Interstate
Major Street
Railroad
State Highway
US Highway
Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Nellis AFB
Unincorporated Clark County
BLM Disposal Bndry
Monitor Name | Constituent
AAAI | Pollen—ended 10/27/2010
Apex | O3, PM10, PM2.5 BAM
Boulder City Hall | Pollen
Craig Rd | O3, PM10, PM2.5 BAM
E Sahara | CO—ended 03/31/2010
Green Valley | PM10, PM2.5 BAM, Pollen
Griffith | Pollen
Indian Springs | O3—started 05/11/2010
JD Smith | PM10, PM2.5 BAM, PM2.5 FRM, CO, NOx, O3, Pollen
Jean | PM10, O3, PM2.5 BAM, PM2.5 FRM
Joe Neal | PM10, O3, NOx
Lone Mt | O3, PM10—both ended 04/27/2010, Pollen—ended 06/27/2010
Mesquite | O3, PM10
Mt Potosi | O3—started 05/11/2010
Orr | CO, PM10, O3—all ended 04/25/2010, Pollen—ended 06/27/2010
Palo Verde | O3, PM10
Paul Meyer | PM10, O3, Pollen
SMYC | O3—started 05/16/2010
Sunrise Acres | CO, PM10, PM2.5 BAM, PM2.5 FRM
Walter Johnson | O3
Winterwood | O3, CO, Pollen
N
W
E
S
Feet
0
8,000
16,000
32,000
48,000
64,000
DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT
Created: May 17, 2010
Source: Clark County Geographic Information Systems Central Repository
This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated herein.
Indian Springs
SMYC
Apex
Mesquite
City of Mesquite
City of North Las Vegas
Joe Neal
Craig Rd
Lone Mt
City of Las Vegas
JD Smith
Palo Verde
Walter Johnson
Griffith
Sunrise Acres
E Sahara
Winterwood
AAAI
Orr
Paul Meyer
Green Valley
City of Henderson
Boulder City Hall
Mt Potosi
Boulder City
Jean
95
15
215
93

APPENDIX B: POLLUTANT TREND PLOTS

Receptor-Measured Criteria Pollutant Trends

This appendix contains plots of criteria pollutant measurements. In general, NO_2 has remained steady over the past few years; CO, O_3, and PM have declined; and SO_2 has remained insignificant.

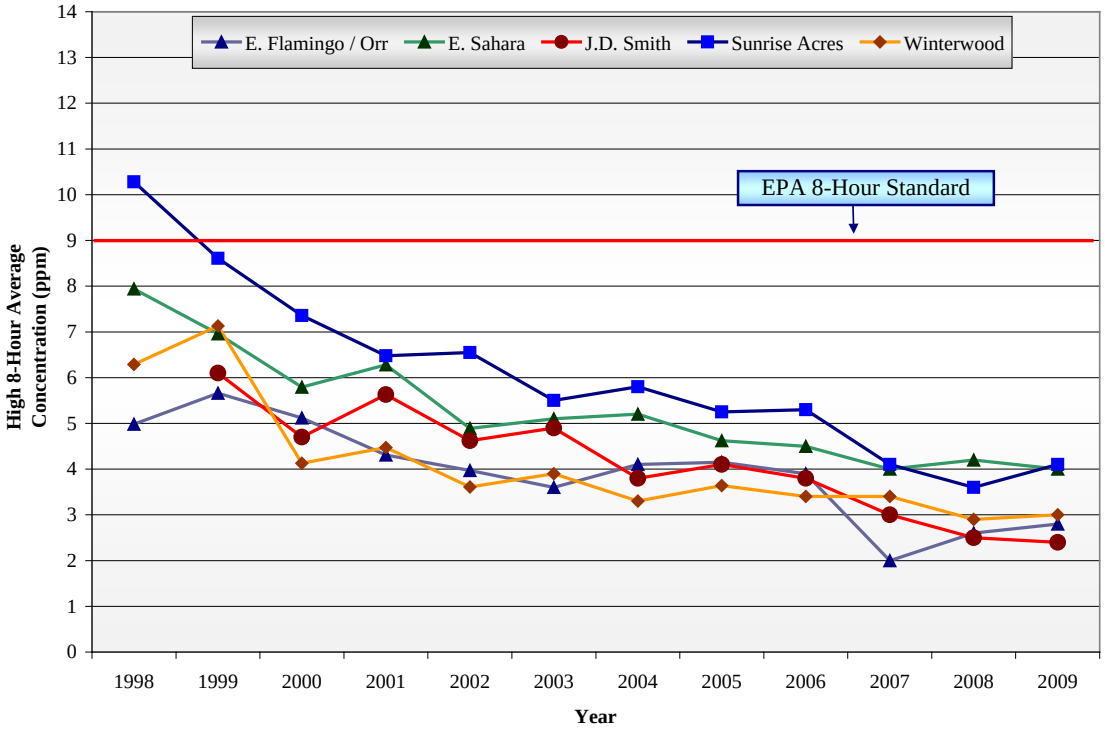


Figure B-1. Carbon Monoxide Trends.

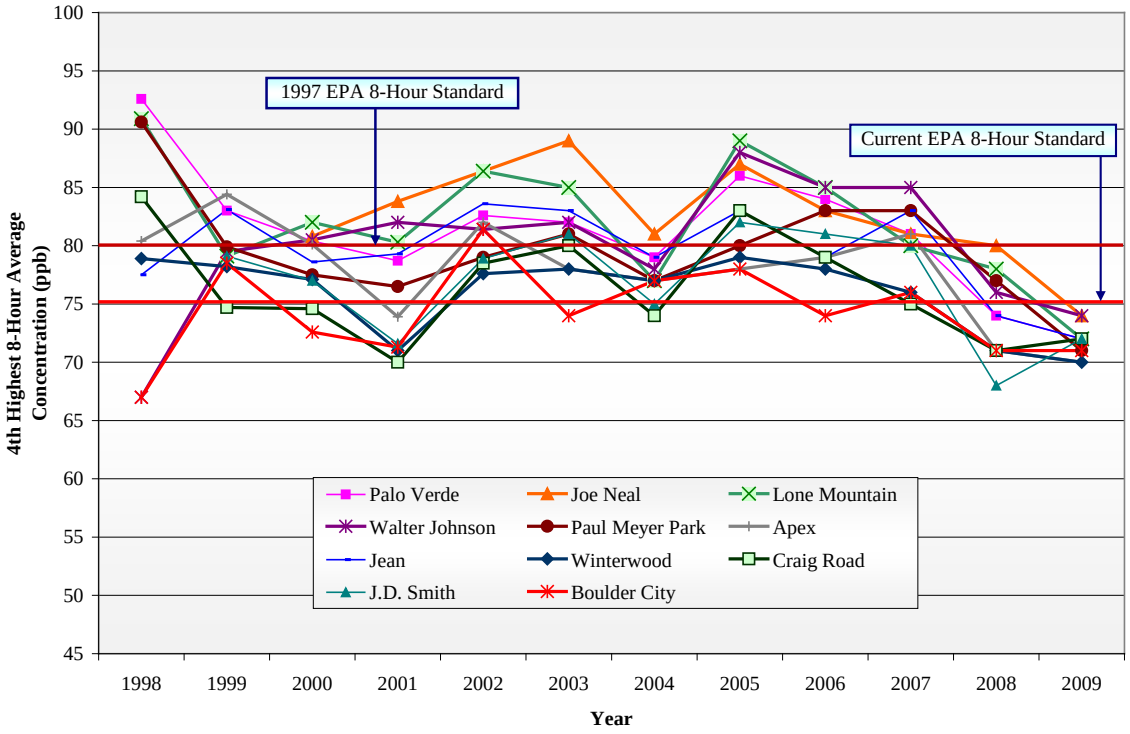


Figure B-2. O_3 Trends.

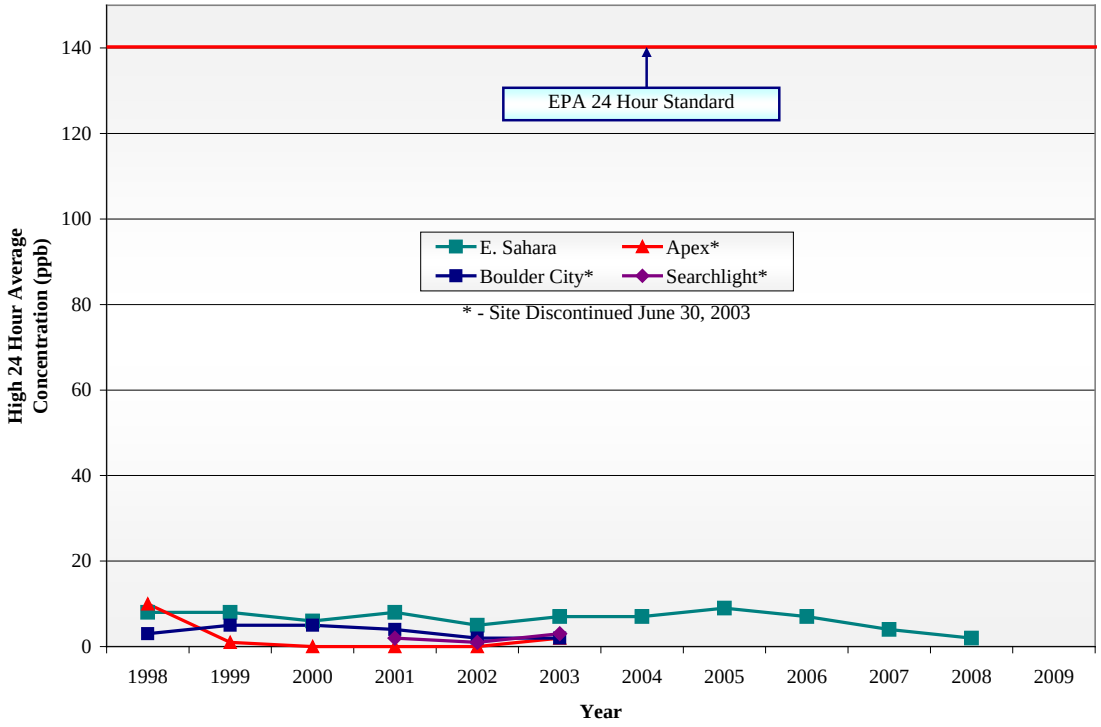


Figure B-3. SO_2 Trends.

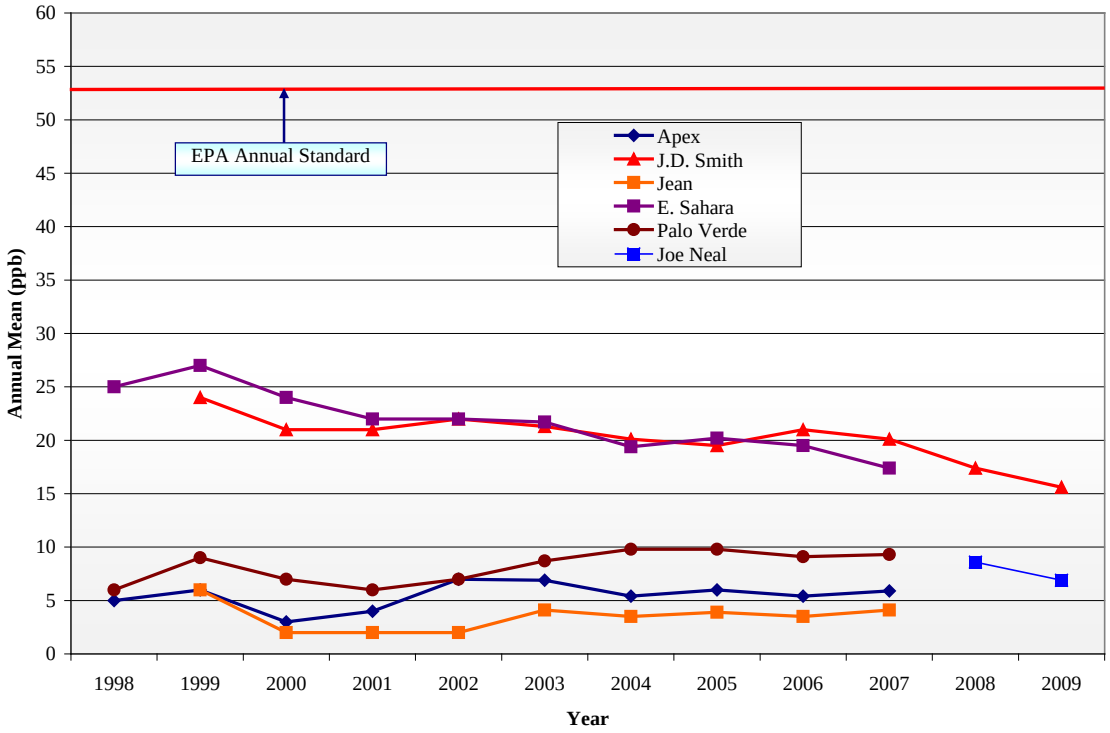


Figure B-4. NO_2 Trends.

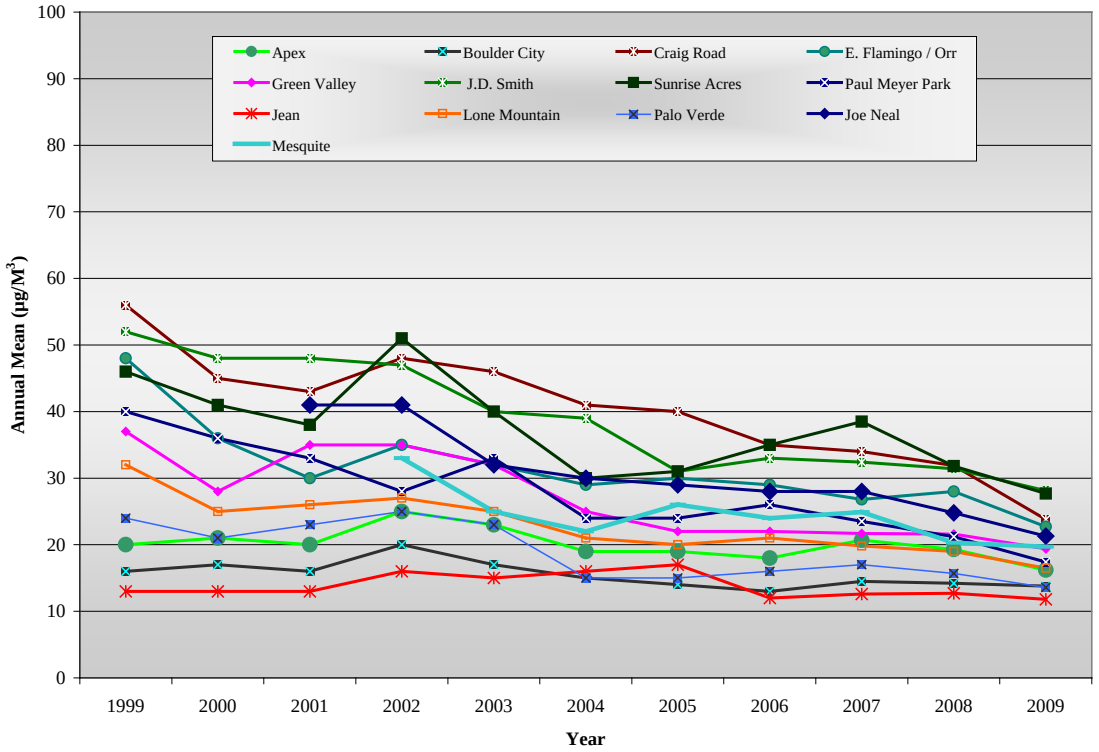


Figure B-5. Continuous PM_{10} Trends.

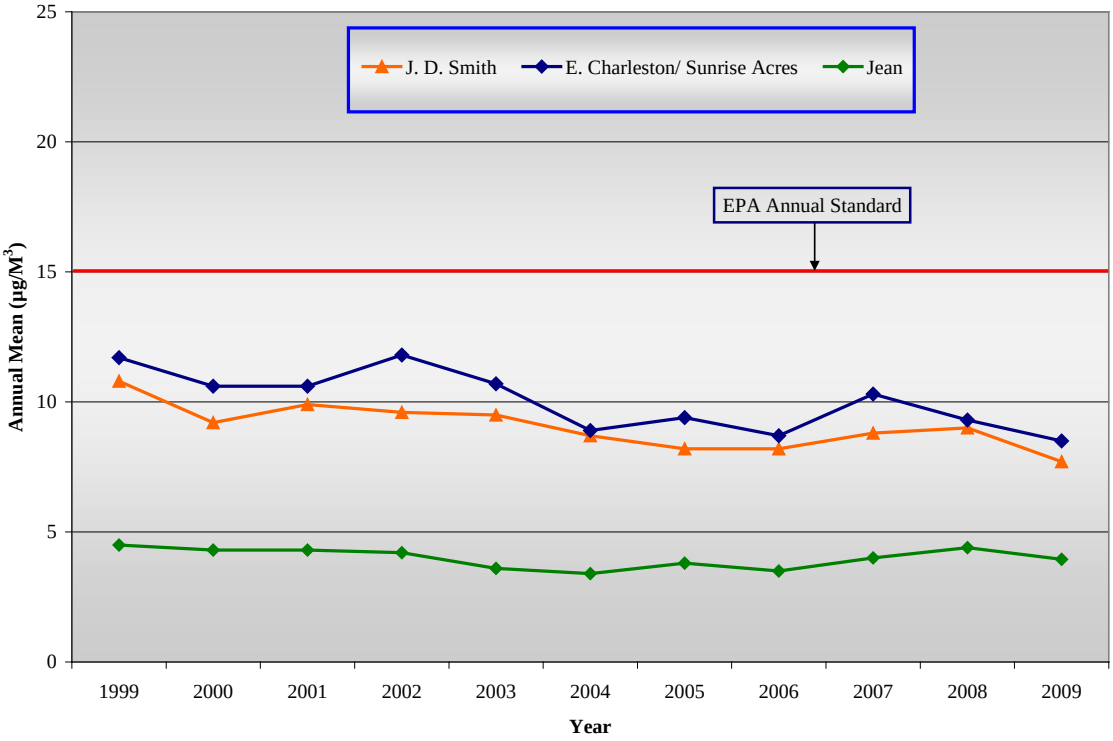


Figure B-6. Filter-Based $PM_{2.5}$ FRM Trends.

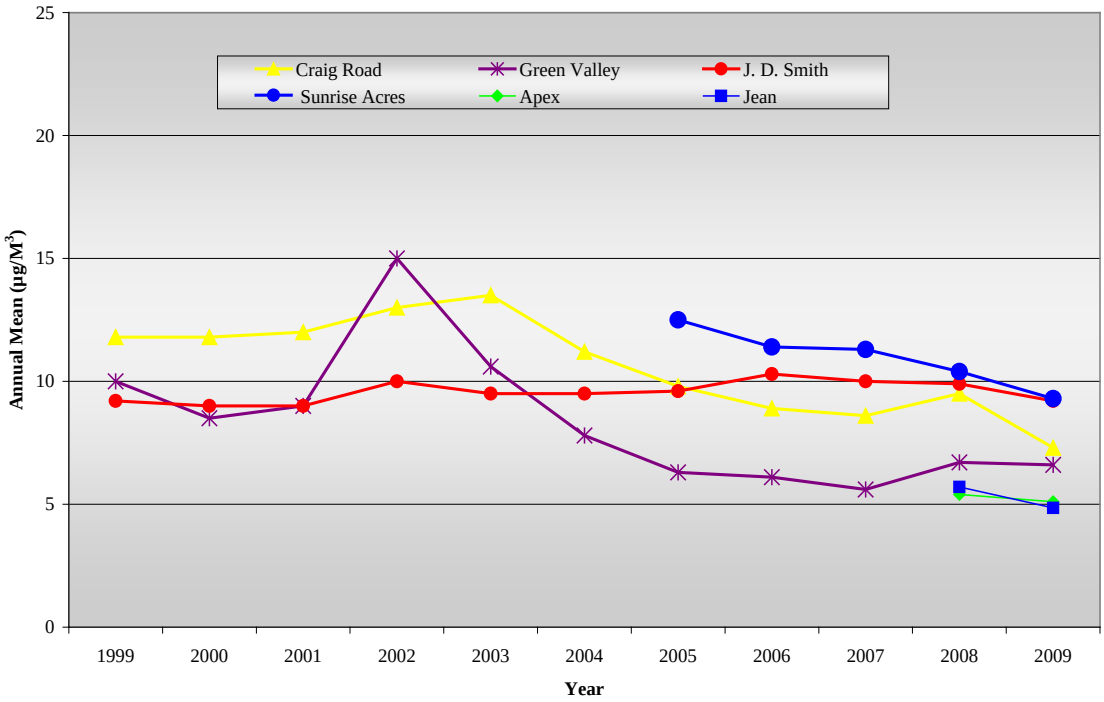


Figure B-7. Continuous $PM2_{.5}$ Annual Mean Trends.

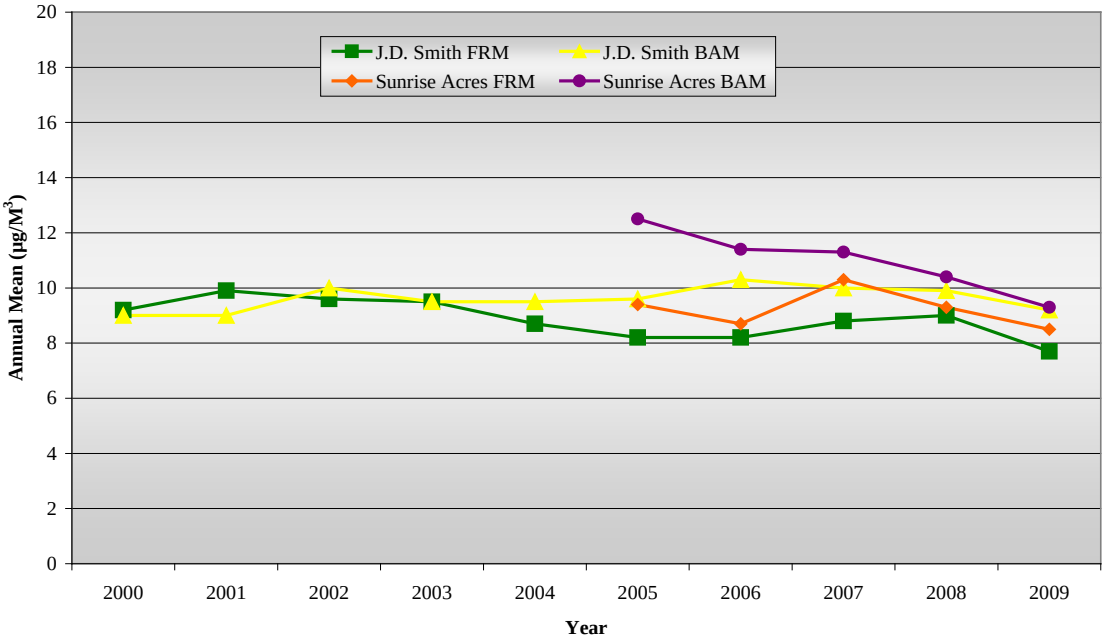


Figure B-8. Continuous vs. Filter-Based $PM_{2.5}$ Trends

APPENDIX C: CRITERIA USED IN MONITORING CRITERIA PRIORITIZATION

Nonnegotiable Site Mandated to Keep

(A) 40 CFR 58 NCore requirement: only one NCore site.
(B) CAA § 103: grant requirements dictate $PM_{2.5}$ FRM collocation and background be maintained at unique sites.
(C) SIP: specific SIPs may have monitoring mandates.

Negotiable Site Mandated to Keep

(A) Meets 40 CFR 58.14 criteria on design value: if design value is high, then the monitor should be maintained; negotiable if nearby monitors have similar design values.
(B) Meets 40 CFR 58.14 criteria on exceedances in the last five years: if there have been exceedances, then the monitor should be maintained. This is negotiable if other monitors nearby match exceedance results.
(C) Meets 40 CFR 58.14 criteria on probability of exceedance of 80 percent of NAAQS in the next three years: if there have been exceedances and the design value is large, it is likely there will be additional exceedances in the next three years, so the monitor should be maintained. This is negotiable if other monitors nearby match the exceedance results.

Non-Negotiable Network Mandated to Keep: None.

Negotiable Network Mandated to Keep

(A) 40 CFR 58, Appendix D—high concentration site (CO & O_3): requires DAQEM maintain a high concentration site for O_3.
(B) 40 CFR 58, Appendix D—background site (O_3 & $PM_{2.5}$): requires DAQEM maintain a background site for O_3 and $PM_{2.5}$.
(C) 40 CFR 58, Appendix D—transport site (O_3 & $PM_{2.5}$): requires DAQEM maintain a transport site for O_3 and $PM_{2.5}$.

Nonmandated Sites to Keep

(A) Does not correlate well to other sites: unique air shed or unique area within the air shed (opposite: correlates well to nearby site).
(B) Correlates well to other pollutants at site: generally O_3, $PM_{2.5}$, and NO_x.
(C) Serves a unique population: e.g., city, remote population, young pulmonary-challenged population.
(D) Serves relatively high population density area: unique population of greater than 50,000.
(E) Sited in residential area (population exposure): monitors upwind of a residential neighborhood.
(F) Serves a unique area: more of a topographical or spatial area, rather than a population-based area.
(G) Absence of monitor results in significant hole in network for monitored pollutant.

(H) Adds value from a history (trend) perspective.
(I) Used to define extent of regional pollutant transport among populated areas.
(J) Supports secondary standard.
(K) Used to evaluate welfare-based impacts: generally, a site that is located near rural populations or that supports a secondary standard.
(L) Located 10–30 miles downwind from Metropolitan Statistical Area.
(M) Located in ideal O_3 flow path.
(N) Demonstrates pollutant flow patterns from valley out of state.
(O) CO monitor located in low point of valley.
(P) Used by meteorologist to prepare exceptional event justification packages.
(Q) Provides improved understanding of O_3-related atmospheric processes.

Nonnegotiable Site Mandated to Close

(A) Eviction notice received.

Negotiable Site Mandated to Close

(A) Expired/nonexistent lease, but no eviction notice.
(B) New shelter needed, no budget.
(C) General improvements or safety upgrades needed, no budget
(D) Site does not meet ideal use siting criteria. Site may meet AQS listed siting objective and scale, but if the siting and scale have no true benefit for the location, the site should be considered for closure.
(E) 40 CFR 58, Appendix D, attainment demonstration: monitor is not usable for attainment demonstrations.
(F) 40 CFR 58, Appendix D, 1.1(a)—providing pollution data to the general public: some special-purpose monitors may not meet this qualifier.

Non-Negotiable Network Mandated To Close: None.

Negotiable Network Mandated to Close

(A) Site correlates well to a nearby site: if the monitor has a high correlation to a nearby site, it should be considered for closure.

Nonmandated to Close

(A) Historical concentration trends are no longer of value.
(B) One of many sites for a population served.
(C) One of many sites in an area served.
(D) Comparatively high operating cost.