

June 3, 2014

Jared Blumenfeld, Regional Administrator
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Re: Annual Network Plan

Dear Mr. Blumenfeld:

The Clark County Department of Air Quality (DAQ) has completed the “Annual Network Plan Report” required by Title 40, Part 58 of the Code of Federal Regulations (40 CFR 58). The plan was made available for the required 30-day public inspection period between April 18 and May 18, 2014, at the DAQ front counter and on the DAQ Web site (<http://www.clarkcountynv.gov/depts/airquality/Pages/default.aspx>). Stakeholders also received an electronic notification. The 30-day public inspection included proposals for near-road NO₂ monitors for Site One and Site Two. DAQ received no public comments, and the Clark County Board of County Commissioners approved the plan on June 3, 2014.

This report addresses the following objectives, set forth in guidance from the U.S. Environmental Protection Agency:

1. Minimum monitoring requirements
2. Site and network specifications
3. Collocation requirements
4. Quality management information (including audits and performance evaluations)
5. Completed and proposed network changes
6. Near-Road monitoring proposals
7. Special purpose monitoring.

Jared Blumenfeld, Region 9 Administrator

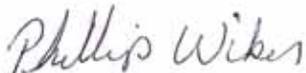
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DAQ will continue to evaluate the monitoring network for program effectiveness in the following areas: user needs, monitor siting, appropriate scale of representation, compliance with monitoring objectives and National Ambient Air Quality Standards, air pollution control programs, and methods for informing the public about air pollution levels.

This plan is an official request for the Region 9 office to determine that the DAQ network monitoring plan meets all applicable requirements of 40 CFR 58. If you have any questions, please contact Yousaf Hameed, Air Quality Monitoring Supervisor, at (702) 379-4465.

Respectfully,



Phillip Wiker

Manager, Air Quality Monitoring

cc:

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Attachments:

Appendix A: Near-Road Site 1 Package

Appendix B: Near-Road Site 2 Package

Appendix C: Site Ranking Documentation

Appendix D: EPA Approvals/Disapprovals and Technical Support Document

Appendix E: Nevada Census and NDOT Analyses

Annual Monitoring Network Plan Report



June 2014

Clark County Department of Air Quality
4701 W. Russell Road, Suite 200
Las Vegas, Nevada 89118

Executive Summary

This document reports the status of the Clark County air monitoring network in 2013, as required by Title 40, Part 58 of the Code of Federal Regulations. It describes network operation in 2013, changes planned for 2014–2015, and the ways in which Clark County disseminates network data to the public in a timely manner.

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ACRONYMS

AADT	annual average daily traffic
AQS	Air Quality System
CBSA	Core-Based Statistical Area
CFR	Code of Federal Regulations
DAQ	Clark County Department of Air Quality
EPA	U.S. Environmental Protection Agency
FEM	federal equivalent method
FRM	federal reference method
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NPAP	National Performance Audit Program
PEP	Performance Evaluation Program
POC	parameter occurrence code
SPM	Special Purpose Monitoring
SLAMS	State/Local Air Monitoring System
TTP	through-the-probe

Section 1: Introduction

This report serves as a review of the current Clark County Department of Air Quality (DAQ) ambient air monitoring network and a plan for future network activities. During 2013, the following conditions existed:

1. DAQ operated monitoring instruments to measure ambient concentrations of continuous and filter-based particulate matter (PM)_{2.5}, continuous PM₁₀, ozone (O₃), carbon monoxide (CO), nitrogen oxides (NO, NO₂, NO_x, NO_y), sulfur dioxide (SO₂), and lead (Pb).
2. DAQ operated under a quality-assured system.
3. DAQ operated visibility instrumentation at North Las Vegas Airport and the Sunset Elemental Carbon/Organic Carbon monitor at the Jerome Mack monitoring station as a special project. DAQ also commissioned a study at Angel Peak using lidar technology.

Criteria air pollutants are a group of six common air pollutants regulated by the U.S. Environmental Protection Agency (EPA), which developed [National Ambient Air Quality Standards \(NAAQS\)](#) for these pollutants to protect public health and the environment. The six criteria pollutants are O₃, PM_{2.5}/PM₁₀, CO, NO₂, SO₂, and Pb. DAQ submits all criteria pollutant data, including precision and accuracy data, to the AQS database quarterly.

Currently, Clark County is designated as “in attainment” for the O₃, PM_{2.5}, CO, and NO₂ NAAQS and “unclassifiable” for SO₂ and Pb. The Las Vegas Valley (Hydrographic Area 212) within Clark County is classified as a “serious nonattainment area” for PM₁₀. The area had attained the PM₁₀ standard as of December 31, 2006, and EPA issued a “Finding of Attainment” in August 2010. However, the area cannot be formally redesignated as “in attainment” until EPA approves the *Request for Redesignation and Maintenance Plan for PM₁₀*, submitted by DAQ in August 2012. EPA action on the request is pending.

DAQ submitted the 2013 annual data certification to EPA on April 30, 2013. It is anticipated that the 2014 annual data certification will be submitted in April 2014.

Air quality data is disseminated to the public in a timely manner via the DAQ website and EPA’s Airnow database. DAQ also provides customized data reports upon request.

Section 2: Minimum Monitoring Requirements

The tables below show that the Clark County air quality network meets or exceeds the 2013 minimum requirements of Title 40, Part 58 of the Code of Federal Regulations (40 CFR 58).

2.1 Ozone

Table 1. Minimum Monitoring Requirements for Ozone

MSA ¹	County	Population & Census Year	8-hr Design Value [ppb], DV Years ²	Design Value site (name, AQS ID ³)	# Required Monitors	# Active Monitors	# Add'l Monitors Needed
Las Vegas-Paradise (29820)	Clark, NV	2,000,759 (2012)	77, 2011-13	Joe Neal (32-003-0075)	2	11	0

¹ Metropolitan Statistical Area.

² DV Years = the three years over which the design value was calculated (e.g., 2011-2013).

³ Air Quality System (site) Identification.

Monitors required for SIP or maintenance plan: NA

This network meets the minimum monitoring requirement for the referenced criteria pollutant.

2.2 PM_{2.5}

Table 2. Minimum Monitoring Requirements for PM_{2.5}

MSA	County	Pop. & Census Yr	Annual Design Value [µg/m ³], DV Years	Annual Design Value Site (name, AQS ID)	Daily Design Value [µg/m ³], DV years	Daily Design Value Site (name, AQS ID)	# Required SLAMS Monitors	# Active SLAMS Monitors	# Add'l SLAMS Monitors Needed
Las Vegas-Paradise (29820)	Clark, NV	2,000,759 (2012)	8.8, 2011-13	Sunrise Acres (32-003-0561)	23, 2011-13	Sunrise Acres (32-003-0561)	2	8 + collocation	0

¹ DV Years = the three years over which the design value was calculated (e.g., 2011-2013).

² This applies to all non-federal reference method (FRM) or -federal equivalence method (FEM) designated instruments, or when there is not enough FRM or FEM data to make a design value determination.

Monitors required for SIP or maintenance plan: NA

This network meets the minimum monitoring requirement for the referenced criteria pollutant.

2.3 PM₁₀

Table 3. Minimum Monitoring Requirements for PM₁₀

MSA	County	Pop. & Census Year	Max. Concentration in 2013 [$\mu\text{g}/\text{m}^3$]	Max. Conc. Site (name, AQS ID)	# Req'd Monitors	# Active Monitors	# Add'l Monitors Needed
Las Vegas-Paradise (29820)	Clark, NV	2,000,759 (2012)	267	Sunrise Acres (32-003-0561)	6-10	9	0

Monitors required for SIP or maintenance plan: NA
 This network meets the minimum monitoring requirement for the referenced criteria pollutant.

2.4 NO₂

Table 4. Minimum Monitoring Requirements for NO₂

CBSA ¹	Pop. & Census Year	Max AADT Counts (2012)	# Req'd Near-road Monitors	# Active Near-road Monitors	# Add'l Near-road Monitors Needed	# Req'd Area-wide Monitors	# Active Area-wide Monitors	# Add'l Area-wide Monitors Needed
Las Vegas-Paradise-Pahrump (332)	2,000,759 (2012)	260,000	1	0	1	1	2	0

¹ Core-Based Statistical Area.

Monitors required for SIP or maintenance plan: NA.

J.D. Smith and Sunrise Acres meet requirements for area wide monitors; Sunrise Acres meets RA40 requirements. EPA Regional Administrator-required monitors per 40 CFR 58, App. D, Sec. 4.3.4: 1

Monitors required for Photochemical Assessment Monitoring Station: NA

One near-road NO₂ monitor is expected to commence in 2014.

2.5 SO₂

Table 5. Minimum Monitoring Requirements for SO₂

CBSA	County	Pop. & Census Year	Total SO ₂ ¹ [tons/yr]	Pop. Weighted Emissions Index ² [million persons-tons/yr]	# Req'd Monitors	# Active Monitors	# Add'l Monitors Needed
Las Vegas-Paradise-Pahrump (332)	Clark, NV	2,000,759 (2012)	7,179	14,364 (est.)	1	1	0

¹Using 2011 NEI data.

²Calculated by multiplying CBSA population and total SO₂ and dividing product by one million.

Population Weighted Emissions Index requirements met.

Monitors required for SIP or maintenance plan: NA

EPA Regional Administrator-required monitors per 40 CFR 58, App. D, Sec. 4.4.3: 0

This network meets the minimum monitoring requirement for the referenced criteria pollutant.

2.6 CO

Table 6. Minimum Monitoring Requirements for CO

CBSA	Pop. & Census Year	# Req'd Near-Road Monitors	# Active Near-Road Monitors	# Add'l Monitors Needed
Las Vegas-Paradise-Pahrump (332)	2,000,759 (2012)	0	0	0

Monitors required for SIP or maintenance plan: NA

EPA Regional Administrator-required monitors per 40 CFR 58, App. D, Sec. 4.2.2: 0

This network meets the minimum monitoring requirement for the referenced criteria pollutant.

2.7 Pb

The source emission threshold for the ambient source-oriented Pb monitoring requirement is 0.50 tons per year. DAQ has not identified sources that might trigger this requirement, and a preliminary assessment has shown no such sources within Clark County. Therefore, DAQ does not conduct source-oriented Pb monitoring.

Table 7. Minimum Monitoring Requirements for Pb at NCore

NCore Site (name, AQS ID)	CBSA	Pop. & Census Year	# Req'd Monitors	# Active Monitors	# Add'l Monitors Needed
Jerome Mack Middle School (32-003-0540)	Las Vegas-Paradise-Pahrump (332)	2,000,759 (2012)	1	1	0

Monitors required for SIP or maintenance plan: NA

This network meets the minimum monitoring requirement for the referenced criteria pollutant.

Section 3: Collocated Monitors as of 2014

Table 8. Filter-Based PM_{2.5} FRM Network

Method Code	# Primary Monitors, Site	# Required Collocated Monitors	# Active Collocated Monitors
RFPS-0498-118	3: Sunrise Acres, Jean and Jerome Mack	1	1 QA collocated

DAQ has upgraded its entire PM_{2.5} FRM network to Thermo Scientific Model 2025i (Method RFPS-0498-118) sampler.

Table 9. Continuous PM_{2.5} FEM Network

Method Code	# Primary Monitors, Site	# Required Collocated Monitors	# Active Collocated FRM Monitors	# Active Collocated FEM Monitors (same method designation as primary)
EQPM-0609-183	4: J.D. Smith, Green Valley, Sunrise Acres, Jean	1	1	0
EQPM-0308-170	1, Jerome Mack	1	1	0

Appendix A of 40 CFR 58 requires 15% of PM_{2.5} FRM and FEM samplers in a network to be collocated. For the PM_{2.5} FRM network (method RFPS-0498-118), the collocated sampler is located at the Jerome Mack (NCore) site. For the PM_{2.5} FEM network (methods EQPM-0609-183 and EQPM-0308-170), the collocated samplers are located at Sunrise Acres and Jerome Mack, respectively. This collocation arrangement meets the Appendix A requirement.

All but two DAQ sites with continuous PM_{2.5} FEM monitors have a collocated PM_{2.5} FRM sampler. The exceptions are J.D. Smith and Green Valley, where the continuous FEM monitor is the only PM_{2.5} instrument on site. The PM_{2.5} FEM monitor at Sunrise Acres serves as the site's primary PM_{2.5} monitor. The Jerome Mack PM_{2.5} FEM monitor is part of the PM Coarse system.

Section 4: 2013 Site Tables

Figure 1: Apex.



The primary objective of this site, approximately 25 miles northeast of Las Vegas, is to monitor the ambient impacts of emissions from nearby processing facilities and power plants. Since the site is generally downwind from Las Vegas, it also serves as an indicator of pollutant transport flow out of the Las Vegas Valley. It is the only Air Quality monitoring station in the Apex Valley. Apex is an EPA-approved seasonal O₃ monitoring site that operates between April and September.

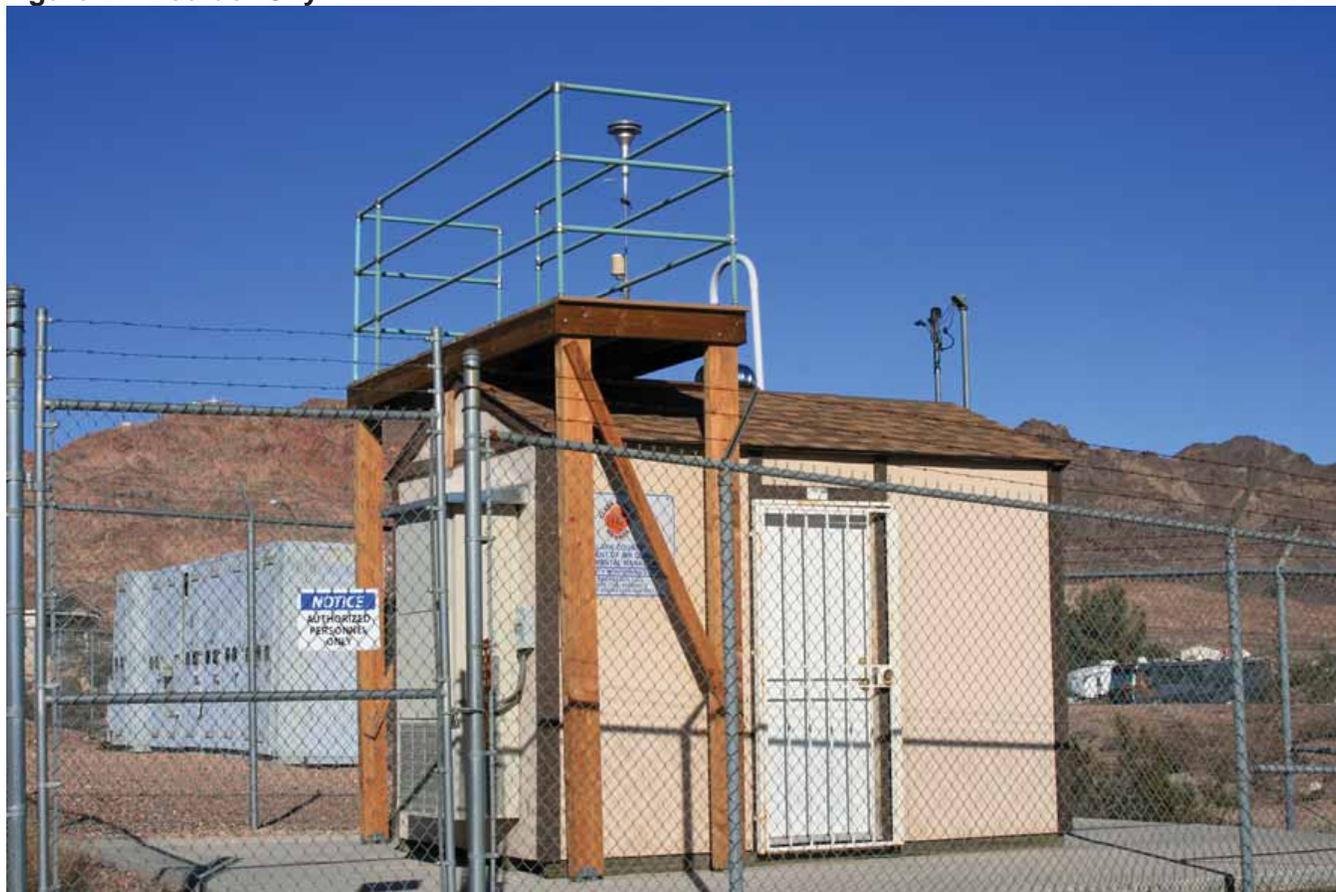
Local Site Name (AQS ID)	Apex (32-003-0022)
GPS Coordinates (latitude, longitude)	+36.391111°, -114.907500°
Street Address	12101 U.S. Highway 93, Las Vegas, NV 89030
Distance to roadway (m)	108
Traffic count (AADT, yr)	1900 (2012)
Ground cover	Native desert
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	O₃, 1
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Regional transport
Monitor type(s)	SLAMS

Pollutant, POC	O ₃ , 1
Instrument manufacturer & model	TAPI 400 series
Method code	EQOA-0992-087
FRM/FEM/ARM/other	FEM
Collecting agency	DAQ
Analytical lab	NA
Reporting agency	DAQ
Spatial scale	Regional
Monitoring start date	01/01/1998
Current sampling frequency	Continuous, seasonal
Calculated sampling frequency	Continuous, seasonal
Sampling season	04/01-09/30
Probe height (m)	3.8
Distance from supporting structure (m)	1.4
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	NA
Obstruction not on roof height (m)	NA
Distance from trees (m)	NA
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	2.9
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	NA
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily
Last annual performance evaluation for gaseous parameters	07/18/2013
Last two semiannual flow rate audits for PM monitors	NA

Meteorological measurements include wind speed, wind direction, and ambient temperature.

Figure 2: Boulder City.



This site, approximately 25 miles southeast of Las Vegas, was established at the request of Boulder City government officials and residents to serve as an indicator of population exposure to pollutants, particularly O₃ and PM₁₀.

Local Site Name (AQS ID)	Boulder City (32-003-0601)
GPS Coordinates (latitude, longitude)	+35.978056°, -114.846389°
Street Address	1005 Industrial Rd., Boulder City, NV 89005
Distance to roadway (m)	58
Traffic count (AADT, yr)	1,600 (2012)
Ground cover	Paved, native desert
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM10, 1	O3, 1
Parameter code	81102	44201
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure, regional transport
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer & model	Thermo FH62C14	TAPI 400 series
Method code	EQPM-1102-150	EQOA-0992-087
FRM/FEM/ARM/other	FEM	FEM
Collecting agency	DAQ	DAQ

Pollutant, POC	PM10, 1	O3, 1
Analytical lab	NA	NA
Reporting agency	DAQ	DAQ
Spatial scale	Neighborhood	Urban
Monitoring start date	01/01/1998	07/01/1998
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Probe height (m)	5.0	4.0
Distance from supporting structure (m)	1.7	1.6
Distance from obstructions on roof (m)	NA	NA
Distance from obstructions not on roof (m)	NA	NA
Obstruction not on roof height (m)	NA	NA
Distance from trees (m)	NA	NA
Distance to furnace or incinerator flue (m)	NA	NA
Distance between colocated monitors (m)	NA	NA
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	NA	Teflon
Residence time for reactive gases (s)	NA	3.0
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual PM2.5? (Y/N)	NA	NA
Frequency of flow rate verification for manual PM samplers	NA	NA
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA
Frequency of one-point QC check for gaseous instruments	NA	Daily
Last annual performance evaluation for gaseous parameters	NA	10/10/2013
Last two semiannual flow rate audits for PM monitors	06/27/2013; 10/07/2013	NA

Meteorological measurements include wind speed, wind direction, ambient temperature, and barometric pressure.

Figure 3: Green Valley.

This site in Henderson was established in response to citizen complaints about dust emissions from a gravel processing plant, and continues to monitor PM₁₀ and PM_{2.5}.

Local Site Name (AQS ID)	Green Valley (32-003-0298)
GPS Coordinates (latitude, longitude)	+36.048611°, -115.052778°
Street Address	298 Arroyo Grande Blvd., Henderson, NV 89014
Distance to roadway (m)	12.2
Traffic count (AADT, yr)	<1,000 (2013) (estimated)
Ground cover	Paved, gravel
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 1	PM _{2.5} (cont.), 3
Parameter code	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer & model	Thermo FH62C14	Thermo 5014i
Method code	EQPM-1102-150	EQPM-0609-183
FRM/FEM/ARM/other	FEM	FEM
Collecting agency	DAQ	DAQ
Analytical lab	NA	NA

Pollutant, POC	PM ₁₀ , 1	PM _{2.5} (cont.), 3
Reporting agency	DAQ	DAQ
Spatial scale	Middle	Middle
Monitoring start date	01/01/1998	10/01/2013
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Probe height (m)	4.8	4.8
Distance from supporting structure (m)	1.8	1.8
Distance from obstructions on roof (m)	NA	NA
Distance from obstructions not on roof (m)	NA	NA
Obstruction not on roof height (m)	NA	NA
Distance from trees (m)	9.0	6.5
Distance to furnace or incinerator flue (m)	NA	NA
Distance between collocated monitors (m)	2.4	2.4
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	NA	NA
Residence time for reactive gases (s)	NA	NA
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	Y
Frequency of flow rate verification for manual PM samplers	NA	NA
Frequency of flow rate verification for automated PM analyzers	Biweekly	Biweekly
Frequency of one-point QC check for gaseous instruments	NA	NA
Last annual performance evaluation for gaseous parameters	NA	NA
Last two semiannual flow rate audits for PM monitors	03/14/2013; 07/19/2013	03/14/2013; 07/19/2013; 10/08/2013

Meteorological measurements include wind speed, wind direction, ambient temperature, and barometric pressure.

DAQ is planning the installation of an O₃ monitor at the Green Valley site and is requesting a waiver based on 40 CFR 58, Appendix E, Section 10. Distance to the roadway is approximately 12 m; however, traffic volume is so low that the effects of scavenging should be negligible. In addition, DAQ anticipates moving the shelter away from the road and trees to meet siting criteria. Other considerations are that this would be the only O₃ monitor in the city of Henderson, the monitor would represent the neighborhood (spatial scale), and the monitor would meet the objective of population exposure.

Figure 4: J.D. Smith.

This site in North Las Vegas replaced the old McDaniel and Post Office PM sites. It monitors gaseous (NO_2 , CO , and O_3) and particulate (PM_{10} and $\text{PM}_{2.5}$) pollutants using continuous methods. It also serves as an indicator of population exposure to pollutants.

Local Site Name (AQS ID)	J.D. Smith (32-003-2002)
GPS Coordinates (latitude, longitude)	+36.191111°, -115.123056°
Street Address	1301B Tonopah Ave., North Las Vegas, NV 89030
Distance to roadway (m)	135
Traffic count (AADT, yr)	7,500 (2012)
Ground cover	Paved, grass
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM_{10} , 1	CO , 1	NO_2 , 1	O_3 , 1	$\text{PM}_{2.5}$ (cont.), 3
Parameter code	81102	42101	42602	44201	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure	Highest concentration	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS

Pollutant, POC	PM ₁₀ , 1	CO, 1	NO ₂ , 1	O ₃ , 1	PM _{2.5} (cont.), 3
Instrument manufacturer & model	Thermo FH62C14	TAPI 300 series	TAPI 200 series	TAPI 400 series	Thermo 5014i
Method code	EQPM-1102-150	RFCA-1093-093	RFNA-1194-099	EQOA-0992-087	EQPM-0609-183
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM	FEM
Collecting agency	DAQ	DAQ	DAQ	DAQ	DAQ
Analytical lab	NA	NA	NA	NA	NA
Reporting agency	DAQ	DAQ	DAQ	DAQ	DAQ
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	01/01/1998	01/10/1998	01/10/1998	01/10/1998	01/01/2013
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round
Probe height (m)	4.6	3.7	3.7	3.7	4.6
Distance from supporting structure (m)	2.0	1.3	1.3	1.3	2.0
Distance from obstructions on roof (m)	NA	NA	NA	NA	NA
Obstruction (wall) not on roof height (m)	5.7	5.7	5.7	5.7	5.7
Distance from obstructions not on roof (m)	3.2	4.0	4.0	4.0	5.3
Distance from trees (m)	22	18.1	18.1	18.1	20
Distance to furnace or incinerator flue (m)	NA	NA	NA	NA	NA
Distance between collocated monitors (m)	2.6	NA	NA	NA	NA
Unrestricted airflow (degrees)	360	360	360	360	360
Probe material for reactive gases	NA	Teflon	Teflon	Teflon	NA
Residence time for reactive gases (s)	NA	6.6	9.8	6.0	NA
Will there be changes within the next 18 months? (Y/N)	N	N	N	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	N	N	N	Y
Frequency of flow rate verification for manual PM samplers	NA	NA	NA	NA	NA

Pollutant, POC	PM₁₀, 1	CO, 1	NO₂, 1	O₃, 1	PM_{2.5} (cont.), 3
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA	NA	NA	Biweekly
Frequency of one-point QC check for gaseous instruments	NA	Daily	Daily	Daily	NA
Last annual performance evaluation for gaseous parameters	NA	12/27/2013	12/27/2013	10/11/2013	NA
Last two semiannual flow rate audits for PM monitors	06/27/2013; 10/11/2013	NA	NA	NA	06/27/2013; 10/11/2013

Meteorological measurements include wind speed, wind direction, ambient temperature, relative humidity, and barometric pressure.

Figure 5: Jean.

The Jean site is approximately 30 miles south of Las Vegas. This site was originally set up as an upwind background site; it still serves this purpose for PM. The primary objective for O₃ monitoring is to measure transport from southern California.

Local Site Name (AQS ID)	Jean (32-003-1019)
GPS Coordinates (latitude, longitude)	+35.785556°, -115.356944°
Street Address	1965 State Route 161, Jean, NV 89019
Distance to roadway (m)	1,287
Traffic count (AADT, yr)	1,600 (2012)
Ground cover	Gravel, native desert
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 1	PM _{2.5} (FRM), 1	O ₃ , 1	PM _{2.5} (cont.), 3
Parameter code	81102	88101	44201	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Upwind background	Upwind background	Regional transport	Upwind background
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer & model	Thermo FH62C14	Thermo 2025i	API 400 series	Thermo 5014i
Method code	EQPM-1102-150	RFPS-0498-118	EQOA-0992-087	EQPM-0609-183
FRM/FEM/ARM/other	FEM	FRM	FEM	FEM
Collecting agency	DAQ	DAQ	DAQ	DAQ
Analytical lab	NA	Weigh	NA	NA
Reporting agency	DAQ	DAQ	DAQ	DAQ

Pollutant, POC	PM ₁₀ , 1	PM _{2.5} (FRM), 1	O ₃ , 1	PM _{2.5} (cont.), 3
Spatial scale	Regional	Regional	Regional	Regional
Monitoring start date	01/01/1995	01/01/1999	08/01/1998	04/01/2013
Current sampling frequency	Continuous	1:3	Continuous	Continuous
Calculated sampling frequency	Continuous	1:3	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Probe height (m)	4.4	2.1	3.9	4.6
Distance from supporting structure (m)	2.0	2.1	1.5	2.1
Distance from obstructions on roof (m)	NA	NA	NA	NA
Distance from obstructions not on roof (m)	NA	NA	NA	NA
Obstruction not on roof height (m)	NA	NA	NA	NA
Distance from trees (m)	NA	NA	NA	NA
Distance to furnace or incinerator flue (m)	NA	NA	NA	NA
Distance between collocated monitors (m)	2.6	NA	NA	2.6
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	NA	NA	Teflon	NA
Residence time for reactive gases (s)	NA	NA	2.3	NA
Will there be changes within the next 18 months? (Y/N)	N	N	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	Y	N	Y
Frequency of flow rate verification for manual PM samplers	NA	Monthly	NA	NA
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA	NA	Biweekly
Frequency of one-point QC check for gaseous instruments	NA	NA	Daily	NA
Last annual performance evaluation for gaseous parameters	NA	NA	10/22/2013	NA
Last two semiannual flow rate audits for PM monitors	03/13/2013; 08/12/2013	03/13/2013; 06/28/2013; 08/12/2013; 12/20/2013	NA	03/13/2013; 08/12/2013

Meteorological measurements include wind speed, wind direction, ambient temperature, solar radiation, and barometric pressure.

Figure 7: Jerome Mack.



This site in east Las Vegas is the Clark County NCore site. Its primary objective is to monitor trace-level gaseous pollutants, PM parameters (including PM_{2.5}, PM coarse, and speciated PM parameters), and meteorological parameters as part of a nationwide network. Because of NCore requirements, speciation sampling was moved here from the East Craig Road site in May 2010. Beginning 2014, this site will host PM_{2.5} primary and collocated FRM samplers.

Local Site Name (AQS ID)	Jerome Mack (32-003-0540)
GPS Coordinates (latitude, longitude)	+36.141944°, -115.078611°
Street Address	4250 Karen Avenue, Las Vegas, NV 89121
Distance to roadway (m)	482
Traffic count (AADT, yr)	23,000 (2012)
Ground cover	Concrete, grass
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 3	PM _{2.5} (cont.), 3	PM _{10-2.5} (cont.), 3	PM _{2.5} (FRM), 1	Speciation SASS, 5	Speciation URG, 5	O ₃ , 1	NO _y , 1	Trace CO, 1	Trace SO ₂ , 1	Pb, 1
Parameter code	81102	88101	86101	88101	88502	88355	44201	42600	42101	42401	14129
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	Research support	NAAQS comparison	Research support	Research support	NAAQS comparison	Research support	Research support	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure	Population exposure
Monitor type(s)	NCore	NCore	NCore	NCore	NCore	NCore	NCore	NCore	NCore	NCore	NCore
Instrument manufacturer & model	Metone BAM 1020	Metone BAM 1020	Metone BAM 1020 (mathematical difference)	Thermo 2025i	Met One SASS	URG 3000	TAPI 400 series	TAPI 200EU	TAPI 300EU	TAPI 100EU	American Ecotech HiVol 3000
Method code	EQPM-0798-122	EQPM-0308-170	EQPM-0709-185	RFPS-0498-118	NA	NA	EQOA-0992-087	NA	RFCA-1093-093	EQSA-0495-100	EQL-0510-191
FRM/FEM/ARM/other	FEM	FEM	FEM	FRM	Other	Other	FEM	Other	FRM	FEM	FEM
Collecting agency	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ
Analytical lab	NA	NA	NA	Weigh	RTI	RTI	NA	NA	NA	NA	RTI
Reporting agency	DAQ	DAQ	DAQ	DAQ	RTI	RTI	DAQ	DAQ	DAQ	DAQ	DAQ
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Urban	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	01/01/2012	01/01/2012	01/01/2012	10/01/2013	05/2010	05/2010	01/01/2011	01/01/2011	01/01/2011	01/01/2011	01/01/2012
Current sampling frequency	Continuous	Continuous	Continuous	1:3	1:3	1:3	Continuous	Continuous	Continuous	Continuous	1:6
Calculated sampling frequency	Continuous	Continuous	Continuous	1:3	1:3	1:3	Continuous	Continuous	Continuous	Continuous	1:6
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round
Probe height (m)	5.1	5.1	5.1	3.1	2.8	3.1	4.1	6.9	4.1	4.1	2.2

Pollutant, POC	PM ₁₀ , 3	PM _{2.5} (cont.), 3	PM _{10-2.5} (cont.), 3	PM _{2.5} (FRM), 1	Speciation SASS, 5	Speciation URG, 5	O ₃ , 1	NO _x , 1	Trace CO, 1	Trace SO ₂ , 1	Pb, 1
Distance from supporting structure (m)	2.1	2.1	2.1	2.1	1.8	2.2	1.1	7.0	1.1	1.1	1.3
Distance from obstructions on roof (m)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Distance from obstructions not on roof (m)	NA	NA	NA	5.9	5.6	4.0	NA	NA	NA	NA	7.7
Obstruction (shelter) not on roof height (m)	NA	NA	NA	3.1	3.1	3.1	NA	NA	NA	NA	3.1
Distance from trees (m)	19.3	20.1	NA	24.8	22.9	22.5	19.0	17.7	19.0	19.0	26.0
Distance to furnace or incinerator flue (m)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Distance between collocated monitors (m)	2.7	2.7	NA	2.9	2.3	2.3	NA	NA	NA	NA	NA
Unrestricted airflow (degrees)	360	360	360	360	360	360	360	360	360	360	360
Probe material for reactive gases	NA	NA	NA	NA	NA	NA	Teflon	Teflon	Teflon	Teflon	NA
Residence time for reactive gases (s)	NA	NA	NA	NA	NA	NA	2.6	NA	1.0	3.1	NA
Will there be changes within the next 18 months? (Y/N)	N	N	N	N	N	N	N	N	N	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	Y	N	Y	N	N	N	N	N	N	N

Pollutant, POC	PM ₁₀ , 3	PM _{2.5} (cont.), 3	PM _{10-2.5} (cont.), 3	PM _{2.5} (FRM), 1	Speciation SASS, 5	Speciation URG, 5	O ₃ , 1	NO _x , 1	Trace CO, 1	Trace SO ₂ , 1	Pb, 1
Frequency of flow rate verification for manual PM samplers	NA	NA	NA	Monthly	Monthly	Monthly	NA	NA	NA	NA	Monthly
Frequency of flow rate verification for automated PM analyzers	Biweekly	Biweekly	Biweekly	NA	NA	NA	NA	NA	NA	NA	NA
Frequency of one-point QC check for gaseous instruments	NA	NA	NA	NA	NA	NA	Daily	Daily	Daily	Daily	NA
Last annual performance evaluation for gaseous parameters	NA	NA	NA	NA	NA	NA	10/23/2013	12/31/2013	12/18/2013	12/31/2013	NA
Last two semi-annual flow rate audits for PM monitors	03/15/2013; 08/15/2013	03/15/2013; 08/15/2013	NA	03/07/2013; 06/28/2013; 08/13/2013; 11/13/2013	03/25/2013; 06/21/2013; 08/13/2013; 12/05/2013	03/25/2013; 06/21/2013; 08/13/2013; 12/05/2013	NA	NA	NA	NA	03/27/2013; 05/17/2013; 08/13/2013; 11/13/2013

Meteorological measurements include wind speed, wind direction, ambient temperature, relative humidity, precipitation, and barometric pressure.

Figure 8: Joe Neal.

The primary objectives of this site in northwest Las Vegas are to monitor O₃ and its precursors in an area of high O₃ concentrations, and to support DAQ modeling efforts. The topography is such that the summertime loft brings higher O₃ and precursor levels toward this site from the east end of the Las Vegas Valley. PM₁₀ was initially deployed at this site due to population growth in the northwest, and the site continues to serve as a high O₃ indicator. A NO_x monitor was added in January 2008 to monitor for O₃ precursors.

Local Site Name (AQS ID)	Joe Neal (32-003-0075)
GPS Coordinates (latitude, longitude)	+36.270556°, -115.238333°
Street Address	6651 W. Azure Way, Las Vegas, NV 89130
Distance to roadway (m)	12.6
Traffic count (AADT, yr)	4,000 (2013) (estimated)
Ground cover	Gravel, grass, pavement
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 1	O ₃ , 1	NO ₂ , 1
Parameter code	81102	44201	42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	Research support
Site type(s)	Population exposure	Max .ozone concentration	Max. precursor impact
Monitor type(s)	SLAMS	SLAMS	SLAMS

Pollutant, POC	PM ₁₀ , 1	O ₃ , 1	NO ₂ , 1
Instrument manufacturer & model	Thermo FH62C14	API 400 series	API 200 series
Method code	EQPM-1102-150	EQOA-0992-087	RFNA-1194-099
FRM/FEM/ARM/other	FEM	FEM	FRM
Collecting agency	DAQ	DAQ	DAQ
Analytical lab	NA	NA	NA
Reporting agency	DAQ	DAQ	DAQ
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	01/01/2001	07/01/2000	01/01/2008
Current sampling frequency	Continuous	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round
Probe height (m)	5.6	4.6	4.6
Distance from supporting structure (m)	2.5	1.6	1.6
Distance from obstructions on roof (m)	NA	NA	NA
Distance from obstructions not on roof (m)	NA	NA	NA
Obstruction not on roof height (m)	NA	NA	NA
Distance from trees (m)	19.9	21.5	21.5
Distance to furnace or incinerator flue (m)	NA	NA	NA
Distance between collocated monitors (m)	NA	NA	NA
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	NA	Teflon	Teflon
Residence time for reactive gases (s)	NA	2.7	4.8
Will there be changes within the next 18 months? (Y/N)	N	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	N	N
Frequency of flow rate verification for manual PM samplers	NA	NA	NA
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA	NA
Frequency of one-point QC check for gaseous instruments	NA	Daily	Daily
Last annual performance evaluation for gaseous parameters	NA	07/24/2013	12/19/2013
Last two semiannual flow rate audits for PM monitors	03/14/2013; 07/18/2013	NA	NA

Meteorological measurements include wind speed, wind direction, ambient temperature, relative humidity, solar radiation, and barometric pressure.

Figure 9: Mesquite.



This site, approximately 70 miles north of Las Vegas and monitors O₃. It sits along a transport and exit corridor for jurisdictional boundaries, and serves as an indicator of population exposure to pollutants. Mesquite is an EPA-approved seasonal O₃ monitoring site that operates between April and September.

Local Site Name (AQS ID)	Mesquite (32-003-0023)
GPS Coordinates (latitude, longitude)	+36.807778°, -114.061389°
Street Address	465 E. Old Mill Rd., Mesquite, NV 89027
Distance to roadway (m)	7.7
Traffic count (AADT, yr)	<1,000 (estimate), 2013
Ground cover	Pavement, gravel
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	O₃, 1
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population exposure
Monitor type(s)	SLAMS
Instrument manufacturer & model	API 400 series
Method code	EQOA-0992-087
FRM/FEM/ARM/other	FEM
Collecting agency	DAQ

Pollutant, POC	O ₃ , 1
Analytical lab	NA
Reporting agency	DAQ
Spatial scale	Neighborhood
Monitoring start date	10/01/2001
Current sampling frequency	Continuous, seasonal
Calculated sampling frequency	Continuous, seasonal
Sampling season	04/01-09/30
Probe height (m)	3.6
Distance from supporting structure (m)	1.2
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	NA
Obstruction not on roof height (m)	NA
Distance from trees (m)	28
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	2.6
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily
Last annual performance evaluation for gaseous parameters	09/18/2013
Last two semiannual flow rate audits for PM monitors	NA

Meteorological measurements include wind speed, wind direction, and ambient temperature.

The O₃ monitor at Mesquite does not meet distance-to-roadway siting requirements; however, DAQ is requesting a waiver based on 40 CFR 58, Appendix E, Section 10. This O₃ monitor is the only monitor in the Virgin Valley airshed (Hydrographic Area 222): it represents the neighborhood (see spatial scale) and meets its objective of population exposure, and there are physical constraints to relocation.

Figure 10: Palo Verde.



The primary objective of this site in west Las Vegas is to monitor O₃, but it also monitors PM₁₀. The topography is such that the summertime loft brings higher O₃ and precursor levels toward this site from the east end of the Las Vegas Valley.

Local Site Name (AQS ID)	Palo Verde (32-003-0073)
GPS Coordinates (latitude, longitude)	+36.173333°, -115.332778°
Street Address	333 Pavilion Center Dr., Las Vegas, NV 89144
Distance to roadway (m)	14.7
Traffic count (AADT, yr)	7,000 (2013) (estimated)
Ground cover	Paved
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 1	O ₃ , 1
Parameter code	81102	44201
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer & model	Thermo FH62C14	API 400 series
Method code	EQPM-1102-150	EQQA-0992-087
FRM/FEM/ARM/other	FEM	FEM
Collecting agency	DAQ	DAQ

Pollutant, POC	PM₁₀, 1	O₃, 1
Analytical lab	NA	NA
Reporting agency	DAQ	DAQ
Spatial scale	Middle	Neighborhood
Monitoring start date	07/01/1998	07/01/1998
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Probe height (m)	4.7	3.8
Distance from supporting structure (m)	2.2	1.4
Distance from obstructions on roof (m)	NA	NA
Distance from obstructions not on roof (m)	NA	NA
Obstruction not on roof height (m)	NA	NA
Distance from trees (m)	25.0	27.1
Distance to furnace or incinerator flue (m)	NA	NA
Distance between collocated monitors (m)	NA	NA
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	NA	Teflon
Residence time for reactive gases (s)	NA	2.2
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	N
Frequency of flow rate verification for manual PM samplers	NA	NA
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA
Frequency of one-point QC check for gaseous instruments	NA	Daily
Last annual performance evaluation for gaseous parameters	NA	10/21/2013
Last two semiannual flow rate audits for PM monitors	03/15/2013; 07/18/2013	NA

Meteorological measurements include wind speed, wind direction, ambient temperature, and barometric pressure.

Figure 11: Paul Meyer.



The primary objective of this site in southwest Las Vegas is to monitor O₃, but it also monitors PM₁₀. The topography is such that the summertime loft brings higher O₃ and precursor levels toward this site from the east end of the Las Vegas Valley.

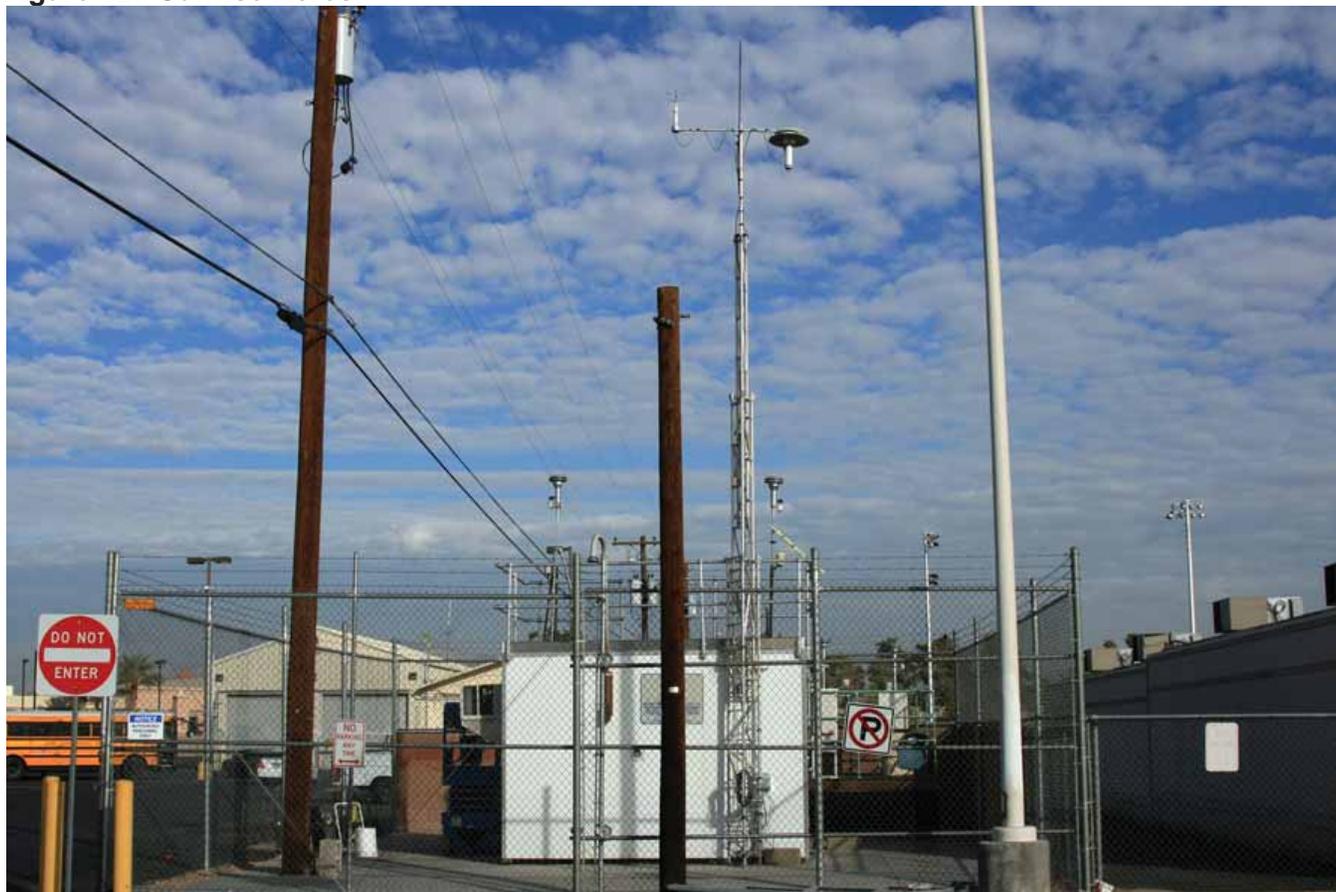
Local Site Name (AQS ID)	Paul Meyer (32-003-0043)
GPS Coordinates (latitude, longitude)	+36.106389°, -115.253333°
Street Address	4525 New Forest Dr., Las Vegas, NV 89147
Distance to roadway (m)	102
Traffic count (AADT, yr)	5,000 (2013) (estimated)
Ground cover	Concrete, grass
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 1	O ₃ , 1
Parameter code	81102	44201
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer & model	Thermo FH62C14	API 400 series
Method code	EQPM-1102-150	EQOA-0992-087
FRM/FEM/ARM/other	FEM	FEM

Pollutant, POC	PM₁₀, 1	O₃, 1
Collecting agency	DAQ	DAQ
Analytical lab	NA	NA
Reporting agency	DAQ	DAQ
Spatial scale	Neighborhood	Neighborhood
Monitoring start date	01/01/1998	07/01/1998
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Probe height (m)	4.8	3.9
Distance from supporting structure (m)	1.6	1.4
Distance from obstructions on roof (m)	NA	NA
Distance from obstructions not on roof (m)	NA	NA
Obstruction not on roof height (m)	NA	NA
Distance from trees (m)	15.3	15.1
Distance to furnace or incinerator flue (m)	NA	NA
Distance between collocated monitors (m)	NA	NA
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	NA	Teflon
Residence time for reactive gases (s)	NA	2.9
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	N
Frequency of flow rate verification for manual PM samplers	NA	NA
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA
Frequency of one-point QC check for gaseous instruments	NA	Daily
Last annual performance evaluation for gaseous parameters	NA	03/29/2013
Last two semiannual flow rate audits for PM monitors	03/14/2013; 07/18/2013	NA

Meteorological measurements include wind speed, wind direction, ambient temperature, and barometric pressure.

Figure 12: Sunrise Acres.



Monitoring at this site near the center of the Las Vegas Valley began as part of a CO study in the 1990s. All monitoring activities at the East Charleston site were transferred here when that lease was terminated. The site's primary objective is to monitor CO and PM; it monitors PM₁₀, and PM_{2.5} using both filter-based and continuous methodologies. Beginning 2014, the PM_{2.5} FEM will be the primary monitor at this site, and it will be collocated with a PM_{2.5} FRM.

Local Site Name (AQS ID)	Sunrise Acres (32-003-0561)
GPS Coordinates (latitude, longitude)	+36.163889°, -115.113889°
Street Address	2501 Sunrise Ave., Las Vegas, NV 89101
Distance to roadway (m)	128
Traffic count (AADT, yr)	3,000 (2013) (estimated)
Ground cover	Paved
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	PM ₁₀ , 1	CO, 1	PM _{2.5} (FRM), 1	PM _{2.5} FRM Collocated, 2	PM _{2.5} (cont.), 3	NO ₂ , 1
Parameter code	81102	42101	88101	88101	88101	42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Highest concentration	Highest concentration	Highest concentration	Highest concentration	Population exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	QA collocated	SLAMS	SLAMS

Pollutant, POC	PM ₁₀ , 1	CO, 1	PM _{2.5} (FRM), 1	PM _{2.5} FRM Collocated, 2	PM _{2.5} (cont.), 3	NO ₂ , 1
Instrument manufacturer & model	Thermo FH62C14	API 300 series	Thermo 2025i	Thermo 2025i	Thermo 5014i	API 200 series
Method code	EQPM-1102-150	RFCA-1093-093	RFPS-0498-118	RFPS-0498-118	EQPM-0609-183	RFNA-1194-099
FRM/FEM/ARM/other	FEM	FRM	FRM	FRM	FEM	FRM
Collecting agency	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ
Analytical lab	NA	NA	Weigh	Weigh	NA	NA
Reporting agency	DAQ	DAQ	DAQ	DAQ	DAQ	DAQ
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	04/17/2004	10/01/1996	07/01/2012	07/01/2012	10/01/2012	01/01/2013
Current sampling frequency	Continuous	Continuous	1:3	1:6	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous	1:3	1:6	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round
Probe height (m)	4.9	3.6	2.9	2.9	3.6	3.6
Distance from supporting structure (m)	2.2	1.2	2.1	2.1	2.1	1.2
Distance from obstructions on roof (m)	NA	NA	NA	NA	NA	NA
Distance from obstructions not on roof (m)	NA	NA	8.4	8.4	NA	NA
Obstruction not on roof height (m)	NA	NA	3.4	3.4	NA	NA
Distance from trees (m)	NA	NA	NA	NA	NA	NA
Distance to furnace or incinerator flue (m)	NA	NA	NA	NA	NA	NA
Distance between collocated monitors (m)	3.0	NA	2.1	2.1	3.0	NA
Unrestricted airflow (degrees)	360	360	360	360	360	360
Probe material for reactive gases	NA	Teflon	NA	NA	NA	Teflon
Residence time for reactive gases (s)	NA	5.4	NA	NA	NA	8.1
Will there be changes within the next 18 months? (Y/N)	N	N	Yes. This will become the collocated sampler for PM _{2.5} .	Yes. This sampler will move to Jerome Mack for FRM collocation.	Yes. This will become the primary monitor for PM _{2.5} .	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	N	Y	Y	Y	N
Frequency of flow rate verification for manual PM samplers	NA	NA	Monthly	Monthly	NA	NA

Pollutant, POC	PM ₁₀ , 1	CO, 1	PM _{2.5} (FRM), 1	PM _{2.5} FRM Collocated, 2	PM _{2.5} (cont.), 3	NO ₂ , 1
Frequency of flow rate verification for automated PM analyzers	Biweekly	NA	NA	NA	Biweekly	NA
Frequency of one-point QC check for gaseous instruments	NA	Daily	NA	NA	NA	Daily
Last annual performance evaluation for gaseous parameters	NA	12/26/2013	NA	NA	NA	12/26/2013
Last two semiannual flow rate audits for PM monitors	06/28/2013; 10/08/2013	NA	03/27/2013; 06/20/2013; 08/15/2013; 12/31/2013	03/27/2013; 06/20/2013; 08/15/2013; 12/31/2013	06/28/2013; 10/08/2013	NA

Meteorological measurements include wind speed, wind direction, ambient temperature, and barometric pressure.

Figure 13: Walter Johnson.

The primary objective of this site on the west side of Las Vegas is to monitor O₃. The topography is such that the summertime loft brings high O₃ and precursor levels towards this site from the east end of the Las Vegas Valley.

Local Site Name (AQS ID)	Walter Johnson (32-003-0071)
GPS Coordinates (latitude, longitude)	+36.169722°, -115.263056°
Street Address	7701 Ducharme Ave., Las Vegas, NV 89145
Distance to roadway (m)	13.0
Traffic count (AADT, yr)	6,900 (2012)
Ground cover	Concrete/asphalt, grass
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	O₃, 1
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population exposure
Monitor type(s)	SLAMS
Instrument manufacturer & model	API 400 series
Method code	EQOA-0992-087
FRM/FEM/ARM/other	FEM
Collecting agency	DAQ
Analytical lab	NA

Pollutant, POC	O ₃ , 1
Reporting agency	DAQ
Spatial scale	Neighborhood
Monitoring start date	08/01/1998
Current sampling frequency	Continuous
Calculated sampling frequency	Continuous
Sampling season	Year-round
Probe height (m)	3.8
Distance from supporting structure (m)	1.5
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	22.4
Obstruction not on roof height (m)	6.5
Distance from trees (m)	14.6
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	3.0
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily
Last annual performance evaluation for gaseous parameters	10/21/2013
Last two semiannual flow rate audits for PM monitors	NA

Meteorological measurements include barometric pressure.

Figure 14: Winterwood.

This site on the east side of Las Vegas is one of DAQ's oldest sites. Its primary objective is to monitor CO and O₃, and it serves as an indicator for population exposure.

Local Site Name (AQS ID)	Winterwood (32-003-0538)
GPS Coordinates (latitude, longitude)	+36.143056°, -115.056389°
Street Address	5483 Club House Dr., Las Vegas, NV 89142
Distance to roadway (m)	42
Traffic count (AADT, yr)	400 (2013) (estimated)
Ground cover	Grass, paving, gravel
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	CO, 1	O ₃ , 2
Parameter code	42101	44201
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer & model	API 300 series	API 400 series
Method code	RFCA-1093-093	EQOA-0992-087
FRM/FEM/ARM/other	FRM	FEM
Collecting agency	DAQ	DAQ
Analytical lab	NA	NA

Pollutant, POC	CO, 1	O ₃ , 2
Reporting agency	DAQ	DAQ
Spatial scale	Neighborhood	Neighborhood
Monitoring start date	01/01/1998	07/01/1979
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Probe height (m)	3.8	3.8
Distance from supporting structure (m)	1.3	1.3
Distance from obstructions on roof (m)	NA	NA
Distance from obstructions not on roof (m)	4.6	4.6
Obstruction not on roof height (m)	6.0	6.0
Distance from trees (m)	28.0	28.0
Distance to furnace or incinerator flue (m)	NA	NA
Distance between collocated monitors (m)	NA	NA
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	Teflon
Residence time for reactive gases (s)	3.5	3.1
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N	N
Frequency of flow rate verification for manual PM samplers	NA	NA
Frequency of flow rate verification for automated PM analyzers	NA	NA
Frequency of one-point QC check for gaseous instruments	Daily	Daily
Last annual performance evaluation for gaseous parameters	12/30/2013	10/18/2013
Last two semiannual flow rate audits for PM monitors	NA	NA

For all gaseous monitoring operations at all sites, a two-point (zero/span) QC check is conducted daily and a three-point (zero/precision/span) QC check is conducted weekly.

DAQ is considering temporarily or permanently closing this site, which will be part of its 2015 network assessment. If this site is closed permanently, DAQ will follow the requirements outlined in 40 CFR 58.14.

Section 5: Maps of Criteria Pollutant Monitoring Stations in 2013

Figure 15: CO Monitors.

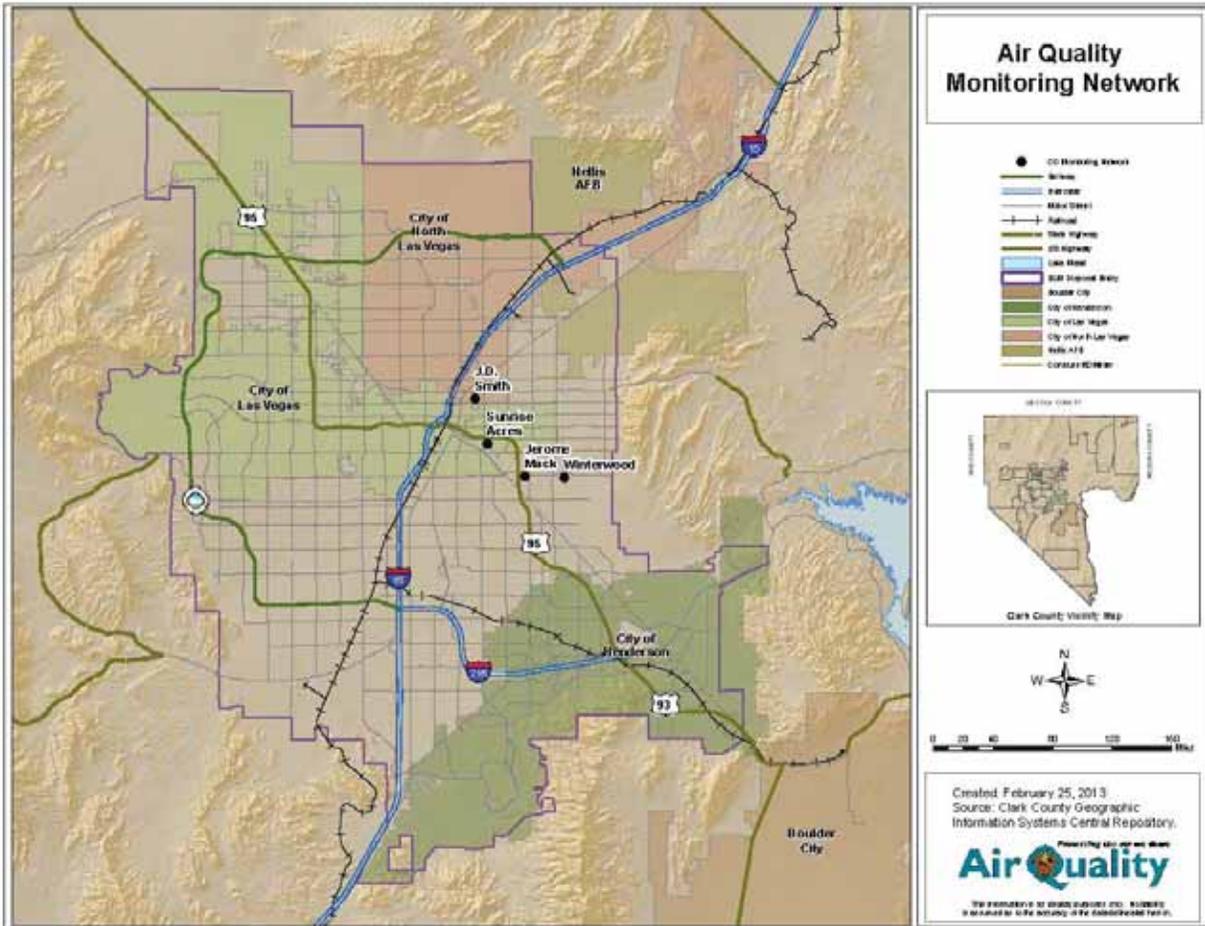


Figure 16: O₃ Monitors.

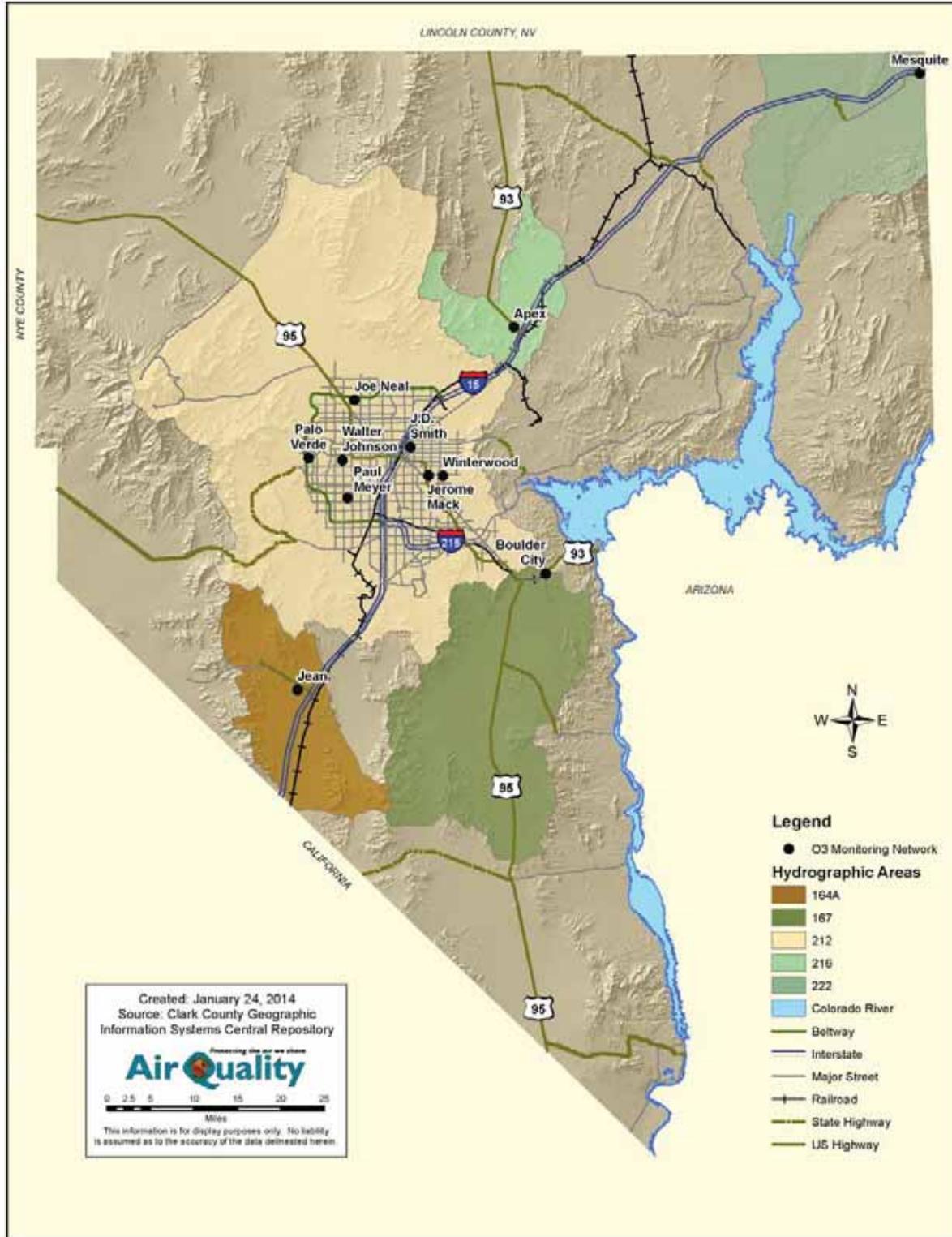


Figure 17: NO_x Monitors.

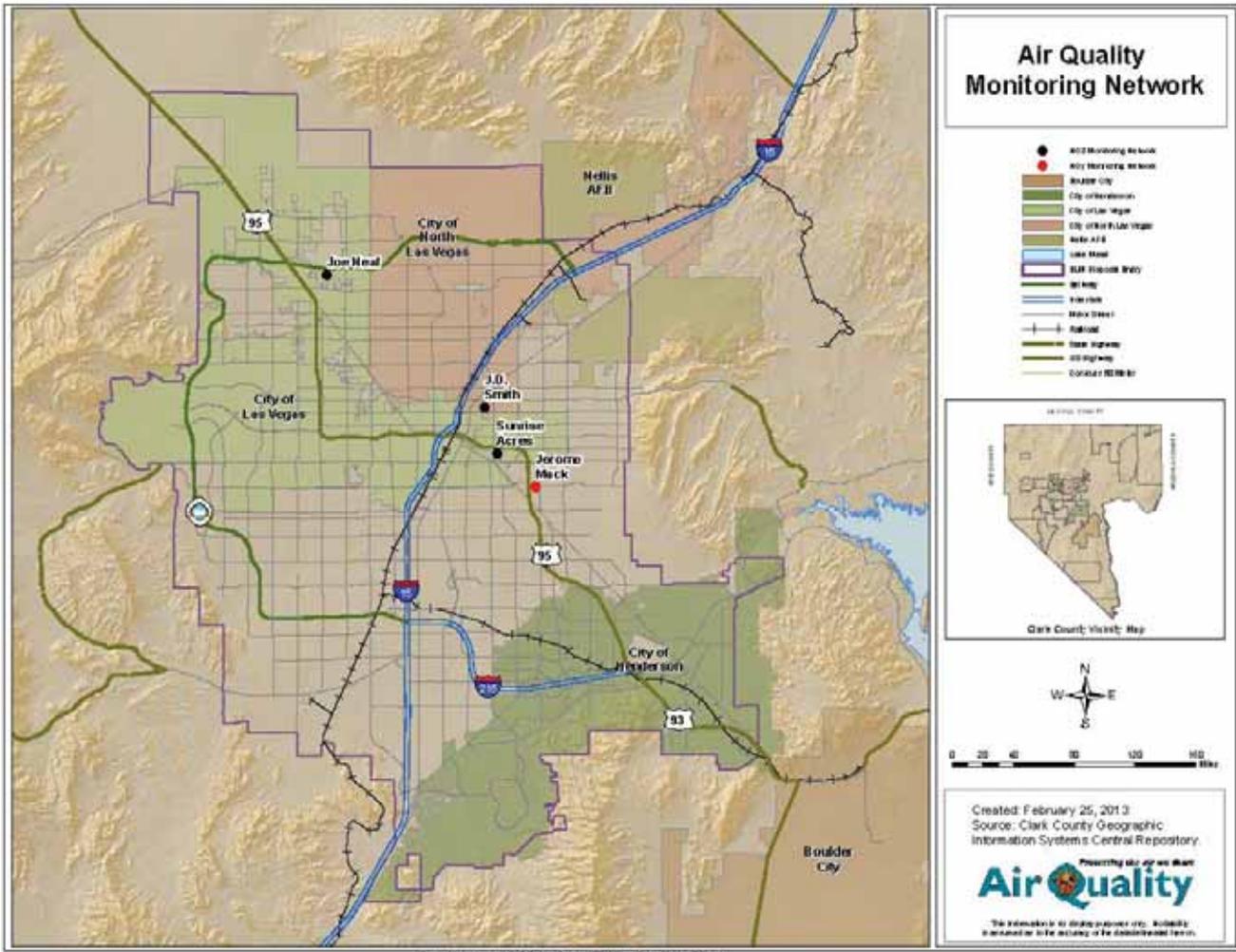


Figure 18: SO₂ Monitors.

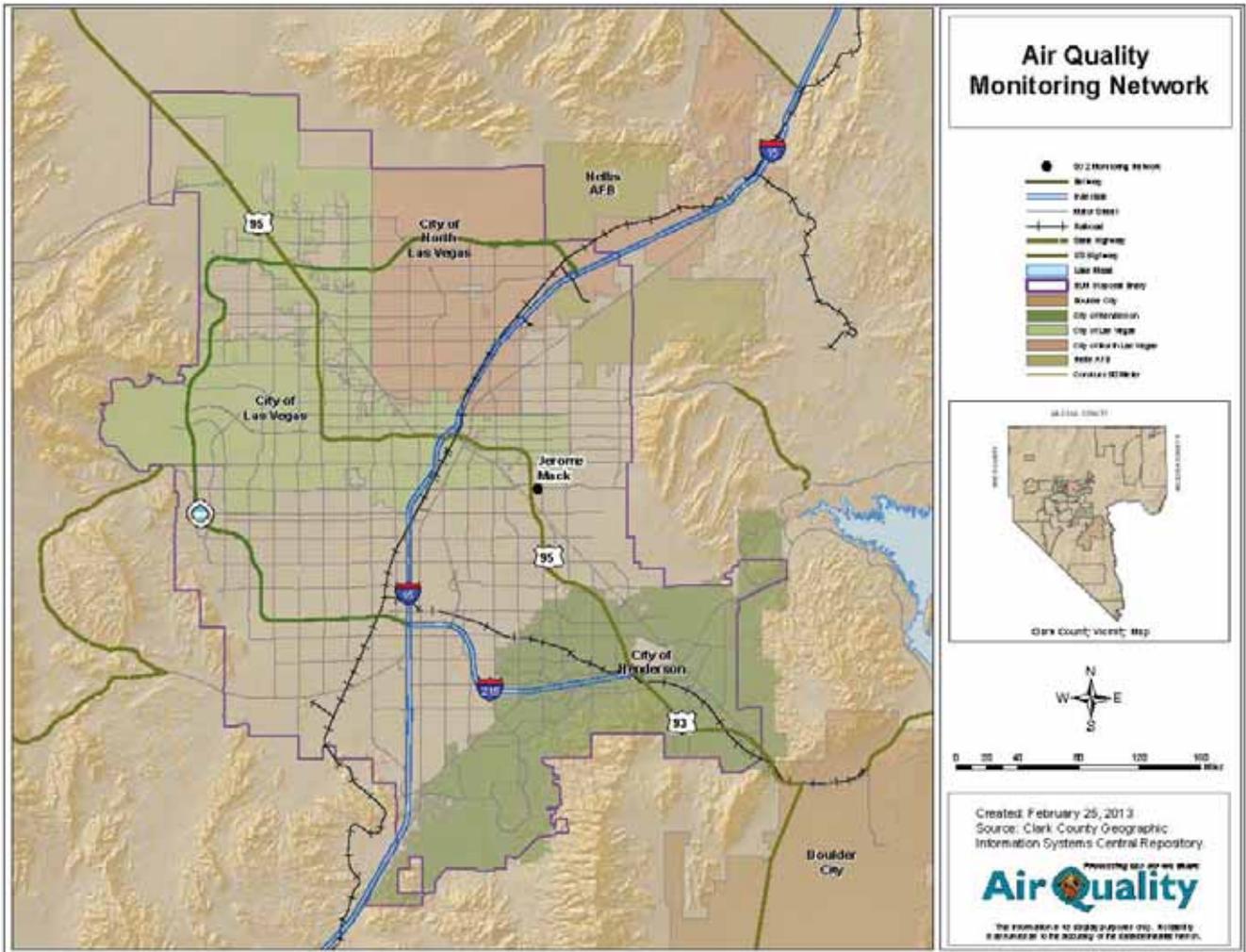


Figure 19: Continuous PM₁₀ Monitors.

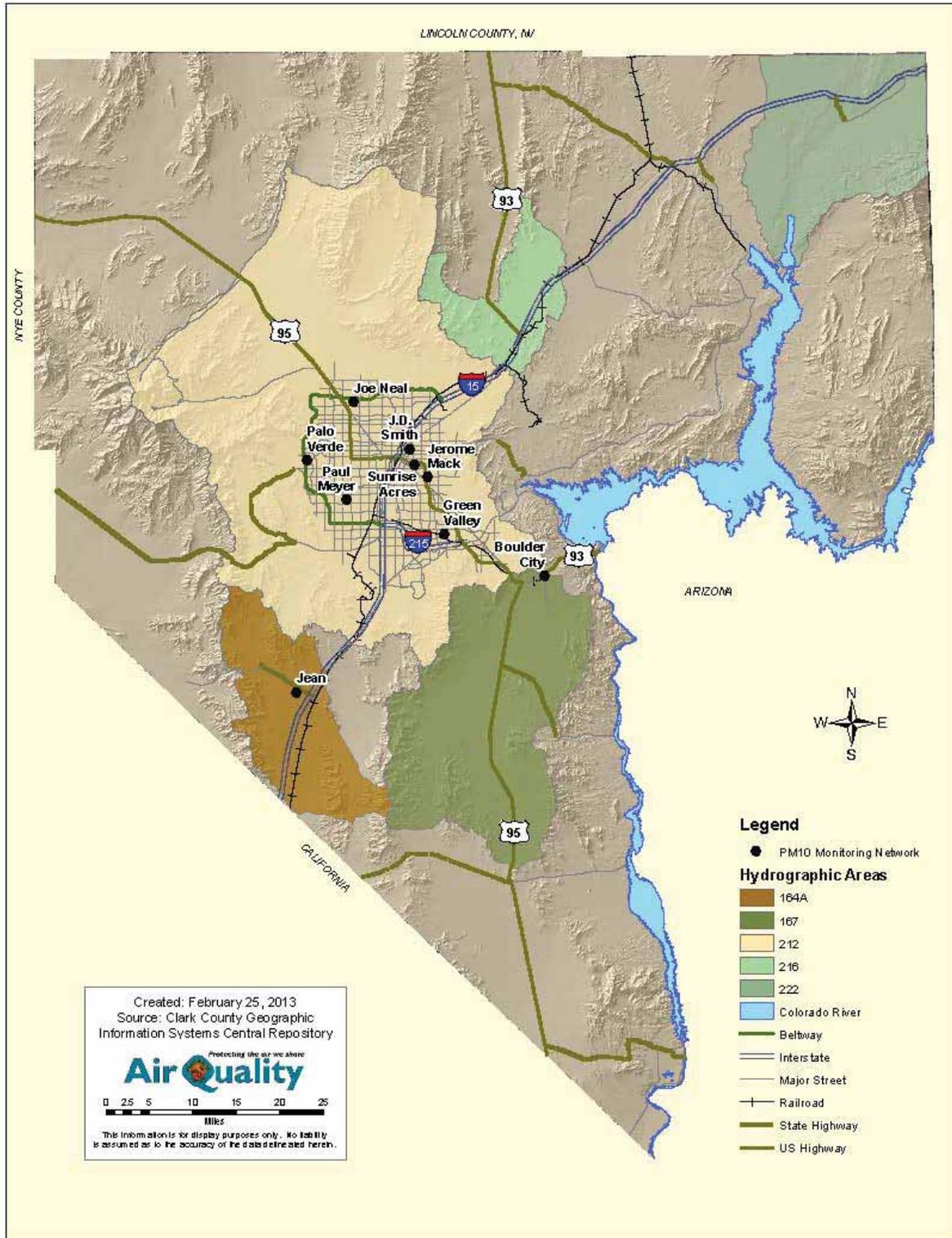


Figure 20: Continuous PM_{2.5} Monitors.

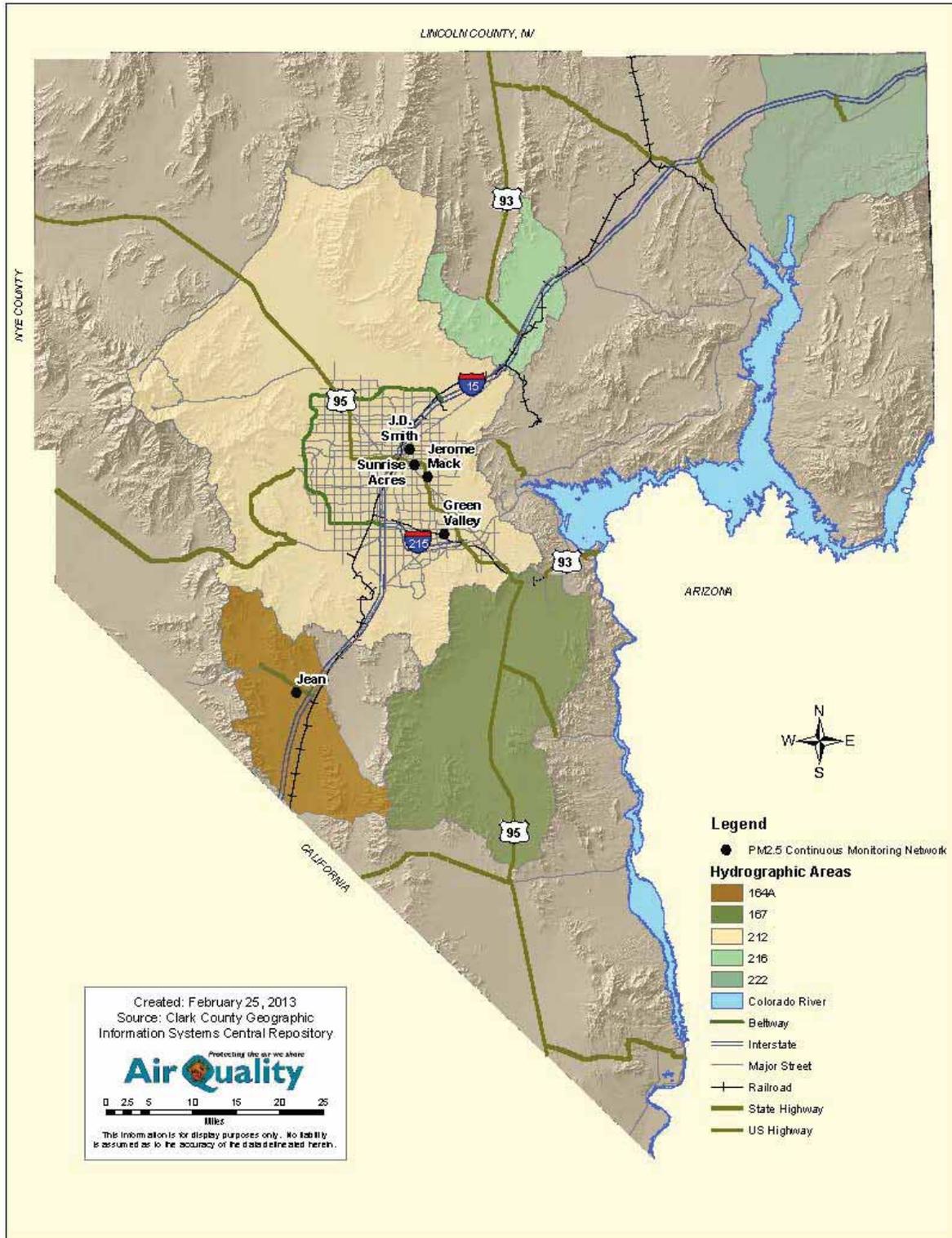
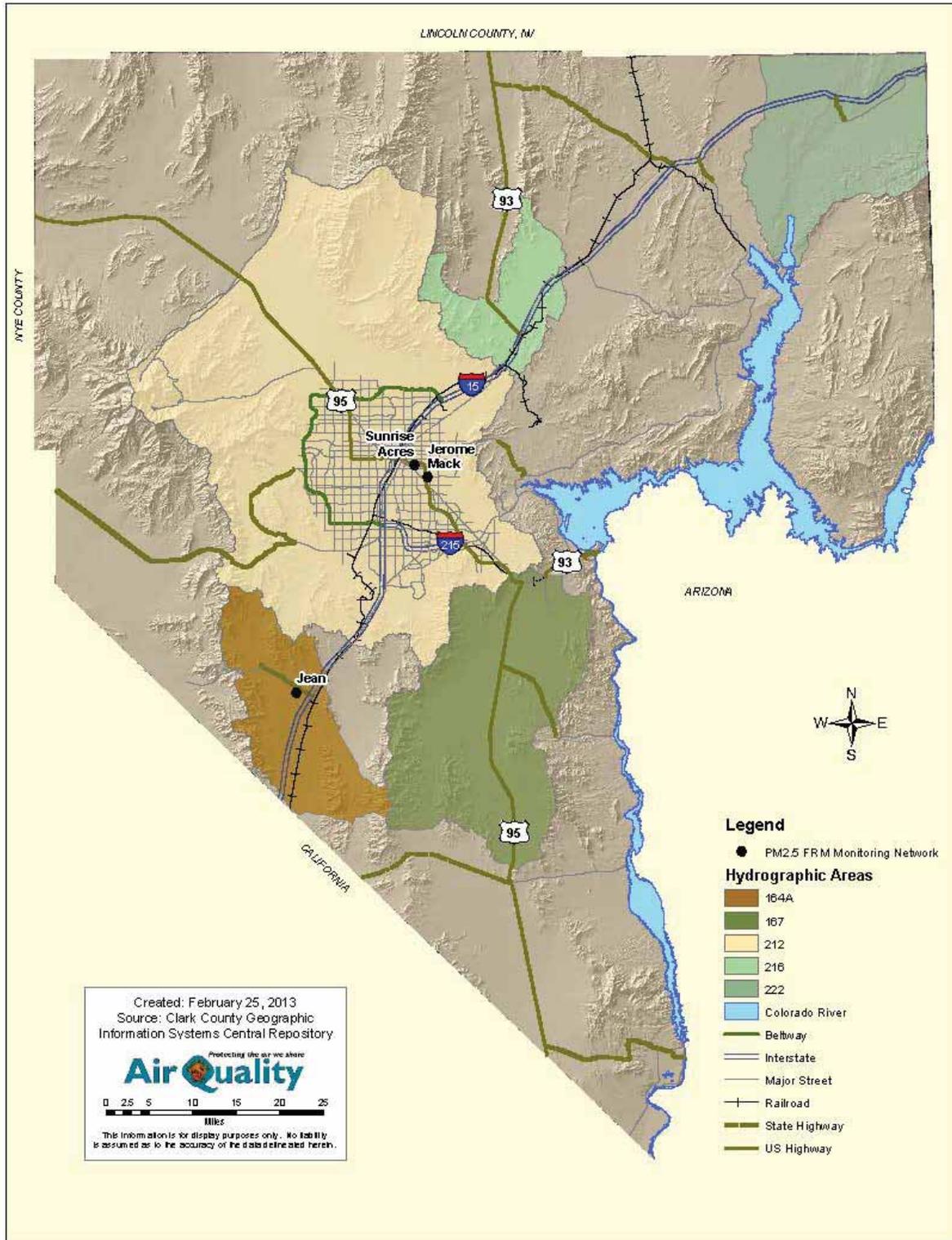


Figure 21: Filter-Based PM_{2.5} Sampler.



Section 6: National Performance Audit and Performance Evaluation Programs

Each year, EPA Region 9 contracts for the National Performance Audit Program (NPAP) Through-the-Probe (TTP) performance evaluation, which focuses on gaseous criteria pollutants. DAQ received a “Pass” on all NPAP and TTP performance evaluations in 2013.

Table 10. 2013 NPAP and TTP Evaluations

Monitoring Station	Pollutant	Evaluation Date
Joe Neal	O ₃ , NO ₂	9/19/13
Winterwood	O ₃ , CO	9/20/13
Jerome Mack	O ₃ , CO, SO ₂	9/23/13

Each year, the PM_{2.5} FRM sampling network undergoes a Performance Evaluation Program (PEP) audit. PEP audit results (in µg/m³) are generated and submitted to the AQS database.

Table 11. 2013 PEP Audit Activity

Sampler Location	Pollutant	Audit Date
Sunrise Acres, Jean	PM _{2.5} (FRM)	2/06/13
Sunrise Acres, Jean	PM _{2.5} (FRM)	4/10/13
Jerome Mack	PM _{2.5} (FRM)	7/15/13
Jean	PM _{2.5} (FRM)	12/06/13

Section 7: Network Modifications

7.1 Completed Changes

DAQ has made the following network changes.

Table 12. Summary of 2013 Network Modifications

Action	Date	Explanation
Replaced continuous PM _{2.5} monitor at Jean	04/01/2013	Upgraded from non-designated PM _{2.5} to PM _{2.5} FEM
Replaced continuous PM _{2.5} monitor at J.D. Smith	01/01/2013	Upgraded from non-designated PM _{2.5} to PM _{2.5} FEM
Replaced continuous PM _{2.5} monitor at Green Valley	10/01/2013	Upgraded from non-designated PM _{2.5} to PM _{2.5} FEM
Added NO ₂ monitoring at Sunrise Acres	01/01/2013	Added to meet RA40 requirements

7.2 Proposed Changes

This section, which describes anticipated and potential changes to the monitoring network over the next two years, constitutes Clark County's official request to Region 9 for approval of proposed changes.

Table 13. Proposed Site and Equipment Changes, 2014–2015

Site/Equipment Changes	Date	Explanation
Near-road site 1	July 2014	See appendix
Near-road site 2	January 2015	See appendix
O ₃ Monitor in Indian Springs	June 2014	This site will fill a spatial gap for O ₃ monitoring and could provide insight into transport
O ₃ Monitor in Logandale	June 2014	This site will fill a spatial gap for O ₃ monitoring
O ₃ Monitor at Spring Mountain Youth Camp	May 2015	This site will be an upper-elevation O ₃ research site
O ₃ Monitor at Green Valley Site	January 2015	See Green Valley Site information in Section 4
Winterwood Site	January 2016	This site may produce data redundant with Jerome Mack. The proposed closing will follow requirements outlined in 40 CFR 58.14

Figure 62: Indian Springs (Proposed SPM Site).

This proposed site approximately 45 miles northwest of Las Vegas was part of a summer study in 2010. Based on the 2010 *Five-Year Network Assessment* and previous monitoring data, this site appears to fill a spatial gap for O₃ monitoring and could help identify high-O₃ areas in Clark County. This site may also provide high-O₃ triangulation between Joe Neal and the Las Vegas Paiute Tribe site that came on line in 2013.

Local Site Name (AQS ID)	Indian Springs (32-003-7772)
GPS Coordinates (latitude, longitude)	+36.569333°, -115.676651°
Street Address	668 Gretta Ln., Indian Springs, NV
Distance to roadway (m)	100
Traffic count (AADT, yr)	< 1,000 (2013)
Ground cover	Native desert
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	O3, 1
Parameter code	44201
Basic monitoring objective(s)	Research support
Site type(s)	Regional transport
Monitor type(s)	Special purpose
Instrument manufacturer & model	TAPI 400 series
Method code	EQOA-0992-087
FRM/FEM/ARM/other	FEM
Collecting agency	DAQ
Analytical lab	NA
Reporting agency	DAQ

Pollutant, POC	O3, 1
Spatial scale	Regional
Monitoring start date	2014
Current sampling frequency	NA
Calculated sampling frequency	NA
Sampling season	Year-round
Probe height (m)	5 (anticipated)
Distance from supporting structure (m)	2 (anticipated)
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	5 estimated
Obstruction not on roof height (m)	4 estimated
Distance from trees (m)	NA
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	NA
Will there be changes within the next 18 months? (Y/N)	Y (O ₃ installation)
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	NA
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily (anticipated)
Last annual performance evaluation for gaseous parameters	NA
Last two semiannual flow rate audits for PM monitors	NA

Figure 73: Logandale (Proposed SPM Site).

This proposed site is approximately 50 miles northeast of Las Vegas. The site is expected to fill a spatial gap for O₃ monitoring, and could provide insight into transport.

Local Site Name (AQS ID)	Logandale (TBD)
GPS Coordinates (latitude, longitude)	+36.605988°, -114.473948°
Street Address	3570 Lyman Street, Logandale, NV
Distance to roadway (m)	61
Traffic count (AADT, yr)	200 (2013)
Ground cover	Native desert
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	O3, 1
Parameter code	44201
Basic monitoring objective(s)	Research support
Site type(s)	Regional transport
Monitor type(s)	Special purpose
Instrument manufacturer & model	TAPI 400 series
Method code	EQOA-0992-087
FRM/FEM/ARM/other	FEM
Collecting agency	DAQ
Analytical lab	NA
Reporting agency	DAQ

Pollutant, POC	O3, 1
Spatial scale	Regional
Monitoring start date	2014
Current sampling frequency	NA
Calculated sampling frequency	NA
Sampling season	Year-round
Probe height (m)	5 (anticipated)
Distance from supporting structure (m)	2 (anticipated)
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	7 estimated
Obstruction not on roof height (m)	5 estimated
Distance from trees (m)	NA
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	NA
Will there be changes within the next 18 months? (Y/N)	Y (O ₃ installation)
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	NA
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily (anticipated)
Last annual performance evaluation for gaseous parameters	NA
Last two semiannual flow rate audits for PM monitors	NA

Figure 84: Spring Mountain Youth Camp (Proposed SPM Site).

This proposed site approximately 30 miles northwest of Las Vegas will be an upper-elevation O₃ research site.

Local Site Name (AQS ID)	Spring Mountain Youth Camp (32-003-7771)
GPS Coordinates (latitude, longitude)	+ 36.318889 °, - 115.585278 °
Street Address	2400 Angel Peak Place
Distance to roadway (m)	30
Traffic count (AADT, yr)	300 (2013)
Ground cover	Gravel, concrete
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	O3, 1
Parameter code	44201
Basic monitoring objective(s)	Research support
Site type(s)	Regional transport
Monitor type(s)	Special purpose
Instrument manufacturer & model	TAPI 400 series
Method code	EQOA-0992-087
FRM/FEM/ARM/other	Other
Collecting agency	DAQ
Analytical lab	NA

Pollutant, POC	O3, 1
Reporting agency	DAQ
Spatial scale	Regional
Monitoring start date	2015
Current sampling frequency	NA
Calculated sampling frequency	NA
Sampling season	Year-round
Probe height (m)	5 (anticipated)
Distance from supporting structure (m)	1 (anticipated)
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	1 estimated
Obstruction not on roof height (m)	5 estimated
Distance from trees (m)	NA
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	180
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	NA
Will there be changes within the next 18 months? (Y/N)	Y (O ₃ installation)
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	NA
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily (anticipated)
Last annual performance evaluation for gaseous parameters	NA
Last two semiannual flow rate audits for PM monitors	NA

Figure 95: Near-Road Site 1.



This proposed near-road monitoring location is at the southeast side of the intersection between South Rancho Drive and Teddy Drive in Las Vegas. This will be the first near-road monitor DAQ deploys. The near-road approval request package (including the tentative EPA approval letter) is attached to this plan.

Local Site Name (AQS ID)	Teddy and Rancho (TBD)
GPS Coordinates (latitude, longitude)	+36.139822°, -115.175565°
Street Address	2755 S. Rancho Drive, Las Vegas, NV
Distance to roadway (m)	15
Traffic count (AADT, yr)	260,000 (2012)
Ground cover	Unpaved
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	NO₂, 1
Parameter code	42602
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Highest concentration
Monitor type(s)	SLAMS
Instrument manufacturer & model	TAPI 200 series

Pollutant, POC	NO ₂ , 1
Method code	RFNA-1194-099
FRM/FEM/ARM/other	FRM
Collecting agency	DAQ
Analytical lab	NA
Reporting agency	DAQ
Spatial scale	Microscale
Monitoring start date	2014
Current sampling frequency	Continuous
Calculated sampling frequency	Continuous
Sampling season	Year-round
Probe height (m)	4 (anticipated)
Distance from supporting structure (m)	>1 (anticipated)
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	NA
Obstruction not on roof height (m)	NA
Distance from trees (m)	NA
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	NA
Will there be changes within the next 18 months? (Y/N)	Y (site installation)
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	NA
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily (anticipated)
Last annual performance evaluation for gaseous parameters	NA
Last two semiannual flow rate audits for PM monitors	NA

DAQ has secured a lease agreement with the city of Las Vegas, and anticipates construction in mid-2014. Meteorological measurements will include wind speed, wind direction, ambient temperature, and barometric pressure.

Figure 106: Near-Road Site 2.



This proposed site is located southeast of E. Bonanza Road and N. Veterans Memorial Drive, in the Central Fire Station parking lot. It is anticipated this will be the second near-road monitor DAQ deploys. The near-road approval request package is attached to this plan.

Local Site Name (AQS ID)	Central Fire Station (TBD)
GPS Coordinates (latitude, longitude)	+36.174365°, -115.139770°
Street Address	500 N. Casino Center Boulevard, Las Vegas, NV
Distance to roadway (m)	15
Traffic count (AADT, yr)	177,000 (2012)
Ground cover	Paved
Representative statistical area name	Las Vegas-Paradise, NV MSA

Pollutant, POC	NO2, 1
Parameter code	42602
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Highest concentration
Monitor type(s)	SLAMS
Instrument manufacturer & model	TAPI 200 series
Method code	RFNA-1194-099
FRM/FEM/ARM/other	FRM
Collecting agency	DAQ
Analytical lab	NA
Reporting agency	DAQ
Spatial scale	Microscale

Pollutant, POC	NO ₂ , 1
Monitoring start date	2015
Current sampling frequency	Continuous
Calculated sampling frequency	Continuous
Sampling season	Year-round
Probe height (m)	4 (anticipated)
Distance from supporting structure (m)	>1 (anticipated)
Distance from obstructions on roof (m)	NA
Distance from obstructions not on roof (m)	2
Obstruction not on roof height (m)	3
Distance from trees (m)	NA
Distance to furnace or incinerator flue (m)	NA
Distance between collocated monitors (m)	NA
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (s)	NA
Will there be changes within the next 18 months? (Y/N)	Y (site installation)
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	NA
Frequency of flow rate verification for manual PM samplers	NA
Frequency of flow rate verification for automated PM analyzers	NA
Frequency of one-point QC check for gaseous instruments	Daily (anticipated)
Last annual performance evaluation for gaseous parameters	NA
Last two semiannual flow rate audits for PM monitors	NA

DAQ is securing a lease agreement with the city of Las Vegas, and anticipates construction to commence by the close of 2014. Meteorological measurements will include wind speed, wind direction, ambient temperature, and barometric pressure.

7.3 Review Process for Network Modifications

The annual network plan outlines all notices of proposed changes, in compliance with 40 CFR 58.10 (a)(2). DAQ will provide time for a public review when a violating PM_{2.5} monitor is being discontinued or when proposing to reduce any SLAMS monitoring. DAQ will post all notices and documents for public review on its Web site.

7.4 Near-road Monitoring

In March 2013, EPA revised 40 CFR 58 to extend the deadline for commencement of near-road NO₂ monitoring to January 1, 2014. Using guidance in EPA's June 2012 *Near-Road Technical Assistance Document (TAD)*, DAQ identified and proposed a location at the southeast side of the intersection between S. Rancho Drive and Teddy Drive (Site 1). It submitted a site proposal to EPA on January 6, 2014, which is appended to this plan (see Appendix A and Section 7.2). A 30-day public comment period ran from January 9–February 9, 2014, and no comments were received.

Agencies must establish a second near-road monitor for CBSAs with a population of 2.5 million or more, or with a population of 500,000 or more and one or more roadway segments with AADT counts of 250,000 or above, which must be operational no later than January 1, 2015. Clark County meets this threshold; therefore, DAQ has proposed a second location (Site 2), which sits in one of the valley's highest traffic areas and where traffic is congested at least twice per day. Predominant wind flow brings transport from the resort corridors on I-15 and S. Las Vegas Boulevard (Las Vegas Strip), as well as roadside emissions from U.S. Highway 95. Since the site is within 20 m of U.S. 95, it may also be suitable for microscale monitoring. Detailed information related to this second proposed near-road site is appended to this network plan (see Appendix B and Section 7.2).

40 CFR 58 requires one CO monitor to be placed at a near-road site. DAQ anticipates having a monitor operational by January 1, 2017, as required. EPA will also require near-road PM_{2.5} monitoring beginning January 1, 2017. DAQ anticipates having a monitor operational by January 1, 2017, as required.

7.5 Special Purpose Studies

During the summer of 2013, DAQ commissioned a study at Angel Peak that used lidar technology to characterize stratospheric intrusions. The National Oceanic and Atmospheric Administration carried out the study, which demonstrated such stratospheric intrusions may occasionally occur in the Southwest.

At the request of EPA's Office of Air Quality Planning and Standards, DAQ is taking part in the Sunset Elemental Carbon/Organic Carbon evaluation project. A semicontinuous carbon sampler has been installed at the Jerome Mack NCore station and is expected to run for three years. DAQ is now formatting data to be loaded into AQS.

7.6 Future Needs

Through special studies, modeling, forecasting, and a network assessment, DAQ has projected spatial gaps and high pollutant concentrations in specific areas of Clark County. It has identified potential O₃ monitoring sites in Coyote Springs, Primm, and Overton and potential PM₁₀ sites in southwest areas of the Las Vegas Valley. Future sites will likely be started as SPM.

DAQ will redeploy the Spring Mountain Youth Camp (AQS 32-003-7771) and other upper-elevation O₃ research sites in 2015 and beyond, to be operated as SPMs (40 CFR 58.20(a)). Due to physical limitations and restrictive conditions, DAQ will not operate these O₃ monitors in compliance with FRM or FEM requirements, and it will designate related data as nonregulatory. Upper-elevation restrictions include, but are not limited to, modified instrument configurations, operations outside instrument design specifications, deviations from QA and QC frequencies, and siting limitations.

The altitude of prospective sites will cause deviations in the allowable tolerances of O₃ instruments, possibly breaching FRM or FEM designations. Because of these limitations, DAQ cannot fully comply with 40 CFR 58.11, 58.12, Appendix A, or Appendix E. Therefore, DAQ intends to operate these upper elevation O₃ research instruments as SPM, non-FRM, and non-FEM.

One of the main FEM requirements is to comply with testing procedures for the specific pollutant (40 CFR 53.3(b)). For O₃, the setup and start-up of the test analyzer, test samplers, and reference method

must be in strict accordance with the manufacturer's operation manuals. Since the regulation leaves no room for even minor deviations from the manual's specifications (40 CFR 53.32(d)(1)), DAQ upper-elevation O₃ research sites will not comply with FRM or FEM requirements.

DAQ plans to contribute to the goals of the Clean Air Act and the evolving science of air quality. Some of its objectives are to research pollutant and precursor transport, identify stratospheric intrusions and mixing heights, and conduct model validation. A majority of this research will be conducted during the O₃ season, and these upper-elevation research monitors will not be part of the regulatory monitoring network.