MONITORING AND TECHNICAL SERVICES DIVISION

Annual Air Quality Monitoring Network Plan 2019

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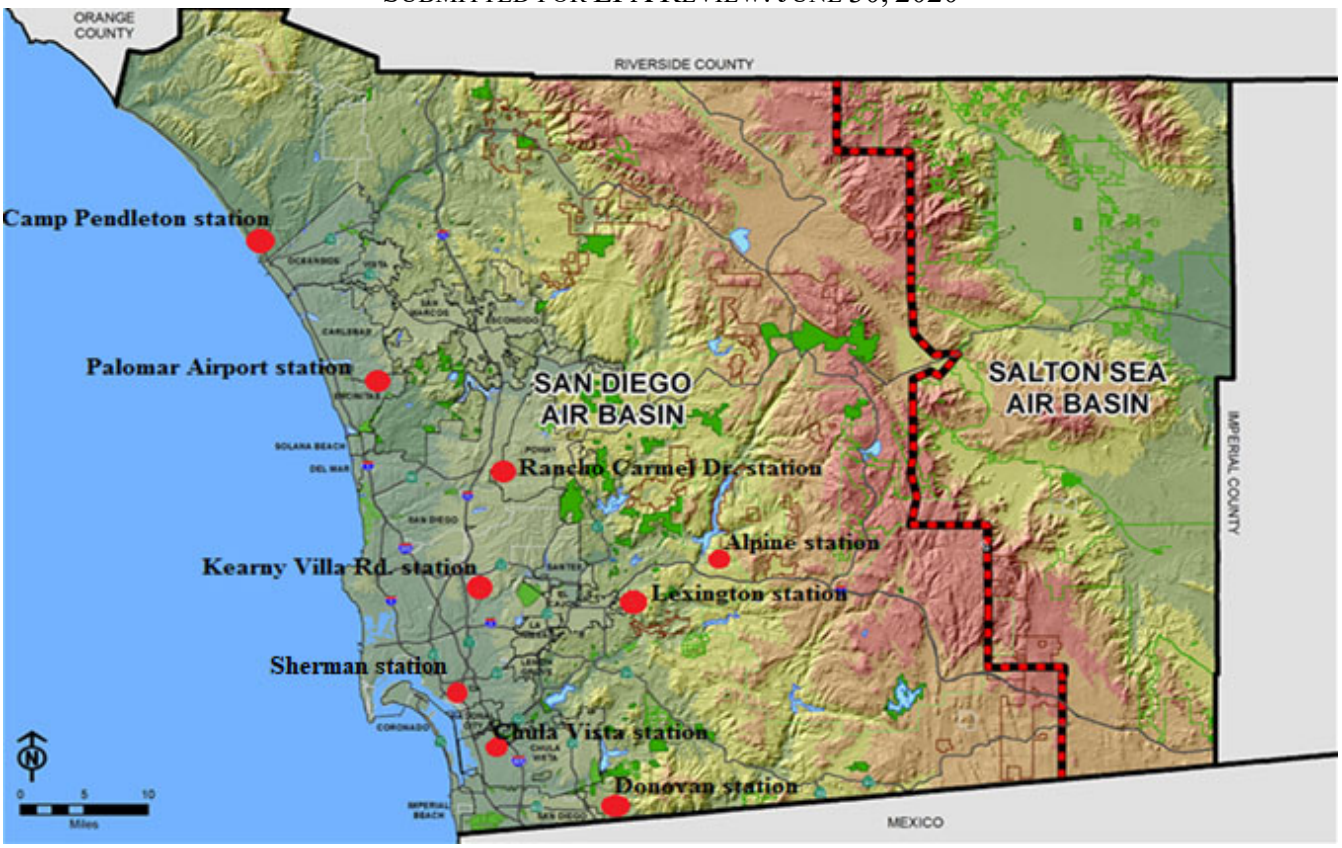

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Table of Contents

CHAPTER 0: ANNUAL NETWORK PLAN REQUIREMENTS 0-1
Section 0.1 Federal Citation 0-1
Section 0.2 Purpose, Scope, and Organization of Annual Network Plan 0-1
Section 0.3 Public Comments Information 0-2
Section 0.3.1 District Contact Information 0-2
Section 0.3.2 Additional Air Pollution Information 0-2
Section 0.4 Description of Monitoring 0-3
Section 0.4.1 Network Design Theory 0-3
Section 0.5 San Diego Air Basin Description 0-3
Section 0.5.1 San Diego Topography 0-4
Section 0.5.2 San Diego Climate 0-4
Section 0.5.3 Population 0-4
CHAPTER 1: OVERVIEW OF THE AIR QUALITY MONITORING NETWORK 1-1
Section 1.1 Executive Summary of the Air Quality Monitoring Network 1-1
Section 1.1.1 Overview of the Pollutant Monitoring Network 1-2
Section 1.1.2 Overview of the Gaseous Pollutant Monitoring Network 1-7
Section 1.1.3 Overview of the Pb-TSP Sampling Network 1-8
Section 1.1.4 Overview of the $PM_{2.5}$ Sampling Network 1-9
Section 1.1.5 Overview of the PM_{10} Sampling Network 1-10
Section 1.1.6 Overview of the PAMS Network 1-11
Section 1.1.7 Overview of the TOXICS Monitoring Network 1-12
Section 1.2 Summary of the Minimum Monitoring Requirements for the SDAB 1-13
Section 1.3 Summary of Minimum Monitoring Requirements (Data) 1-15
Section 1.3.1 Suitability for Comparison to the NAAQS (Data)-Criteria Pollutants 1-15
Section 1.3.2 Quality Control/Quality Assurance (Data)-Criteria Pollutants 1-15
Section 1.3.3 Reporting/Certifying (Data)-Criteria Pollutants 1-15
Section 1.3.4 Unsuitability for Comparison to the NAAQS (Data)-non-Criteria Pollutants & Other 1-15
Section 1.3.5 Quality Control/Quality Assurance (Data)-non-Criteria Pollutants & Others 1-15
Section 1.3.6 Reporting/Certifying (Data)-non-Criteria Pollutants & Others 1-15
Section 1.4 Recent Planned and Unplanned Changes to the Network 1-16
Section 1.4.1 Station Changes (Relocations, Shutdowns, and Additions) 1-16
Section 1.4.1.1 Relocations 1-16
Section 1.4.1.2 Station Shutdowns (Temporary or Permanent): 1-16
Section 1.4.1.3 Station Additions 1-17
Section 1.4.2 Monitor/Sampler/Equipment Replacements, Shutdowns, and Additions 1-17
Section 1.4.2.1 Replacements 1-17
Section 1.4.2.2 Shutdowns 1-17
Section 1.4.2.3 Additions 1-18
Section 1.4.2.4 Other 1-18
Section 1.5 List of Public Comments to this Report and the District Response(s) 1-18
CHAPTER 2: OZONE (O_3) 2-1
Section 2.1 Ozone Introduction 2-1
Section 2.2 Ozone Minimum Monitoring Requirements 2-3
Section 2.2.1 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr) 2-3

Section 2.2.2 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value 2-4
Section 2.2.3 Ozone Minimum Monitoring Requirements-Ozone Season 2-4
Section 2.2.4 Ozone Minimum Monitoring Requirements-NCore & PAMS 2-5
Section 2.2.5 Ozone Minimum Monitoring Requirements-Summary 2-5
Section 2.3 Ozone Suitability for Comparison to the NAAQS 2-6
Section 2.4 Ozone Concentrations for San Diego 2-6
Section 2.4.1 Ozone Concentrations for San Diego-for the Last 20 Years 2-6
Section 2.4.2 Ozone Concentrations for San Diego-by Site for the Year 2-7
Section 2.4.3 Ozone Concentrations for San Diego-by Site for Design Value 2-8
CHAPTER 3: NITROGEN DIOXIDE (NO_2) AND REACTIVE OXIDES OF NITROGEN (NO_Y) 3-1
Section 3.1 Nitrogen Dioxide and Reactive Oxides of Nitrogen Introduction 3-1
Section 3.2 Nitrogen Dioxide Minimum Monitoring Requirements 3-3
Section 3.2.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road 3-3
Section 3.2.1.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (first site) ... 3-3
Section 3.2.1.2 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site) 3-3
Section 3.2.1.3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary) . 3-7
Section 3.2.2 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide 3-7
Section 3.2.3 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator 3-7
Section 3.2.4 Minimum Monitoring Requirements for true-NO_2, PAMS 3-8
Section 3.2.5 Reactive Oxides of Nitrogen Minimum Monitoring Requirements for NCore & PAMS 3-9
Section 3.2.6 NO_2, true-NO_2, & NO_y Minimum Monitoring Requirements-Summary 3-9
Section 3.3 Nitrogen Dioxide Suitability for Comparison to the NAAQS 3-10
Section 3.4 Nitrogen Dioxide Concentrations for San Diego 3-10
Section 3.4.1 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years 3-10
Section 3.4.2 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year 3-11
Section 3.4.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value 3-12
CHAPTER 4: CARBON MONOXIDE (CO) 4-1
Section 4.1 Carbon Monoxide Introduction 4-1
Section 4.2 Carbon Monoxide Minimum Monitoring Requirements 4-3
Section 4.2.1 Carbon Monoxide Minimum Monitoring Requirements-Near-road 4-3
Section 4.2.2 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator 4-3
Section 4.2.3 Carbon Monoxide Minimum Monitoring Requirements-NCore 4-4
Section 4.2.4 Carbon Monoxide Minimum Monitoring Requirements-State (SIP) 4-4
Section 4.2.5 Carbon Monoxide Minimum Monitoring Requirements-Summary 4-4
Section 4.3 Carbon Monoxide Suitability for Comparison to the NAAQS 4-5
Section 4.4 Carbon Monoxide Concentrations for San Diego 4-5
Section 4.4.1 Carbon Monoxide Concentrations for San Diego-for the Last 20 years 4-5
Section 4.4.2 Carbon Monoxide Concentrations for San Diego-by Site for the Year 4-6
CHAPTER 5: SULFUR DIOXIDE (SO_2) 5-1
Section 5.1 Sulfur Dioxide Introduction 5-1
Section 5.2 Sulfur Dioxide Minimum Monitoring Requirements 5-3
Section 5.2.1 Sulfur Dioxide Minimum Monitoring Requirements-NCore 5-3
Section 5.2.2 Sulfur Dioxide Minimum Monitoring Requirements-Ambient 5-3

Section 5.2.3 Sulfur Dioxide Minimum Monitoring Requirements-Summary 5-4
Section 5.3 Sulfur Dioxide Suitability for Comparison to the NAAQS 5-5
Section 5.4 Sulfur Dioxide Concentrations for San Diego 5-5
Section 5.4.1 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years 5-5
Section 5.4.2 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value..... 5-6
CHAPTER 6: LEAD (PB) 6-1
Section 6.1 Lead Introduction 6-1
Section 6.2 Lead Minimum Monitoring Requirements 6-3
Section 6.2.1 Lead Minimum Monitoring Requirements-Source (non-Airport) & Source (Airport) 6-3
Section 6.2.2 Lead Minimum Monitoring Requirements-Special Study (Airport)..... 6-4
Section 6.2.3 Lead Minimum Monitoring Requirements-Regional Administrator 6-4
Section 6.2.4 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA 6-5
Section 6.2.5 Lead Minimum Monitoring Requirements-Summary..... 6-5
Section 6.3 Lead Suitability for Comparison to the NAAQS 6-6
Section 6.3.1 Lead Suitability for Comparison to the NAAQS – Operating Frequency..... 6-6
Section 6.4 Lead Concentrations for San Diego 6-7
Section 6.4.1 Lead Concentrations for San Diego-for the Last 20 Years 6-7
Section 6.4.2 Lead Concentrations for San Diego-by Site for the Year..... 6-8
CHAPTER 7: PARTICULATE MATTER 2.5 µM ($PM_{2.5}$) 7-1
Section 7.1 $PM_{2.5}$ Introduction 7-1
Section 7.2 $PM_{2.5}$ Manual Minimum Monitoring Requirements 7-4
Section 7.2.1 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Design Criteria (24-Hr. & Annual Average) 7-4
Section 7.2.2 $PM_{2.5}$ Manual Minimum Monitoring Requirements-State (SIP)..... 7-5
Section 7.2.3 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (24-Hr & Annual Average)..... 7-6
Section 7.2.4 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Near-road..... 7-6
Section 7.2.5 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Poor Air Quality..... 7-7
Section 7.2.6 $PM_{2.5}$ Manual Minimum Monitoring Requirements-NCore 7-7
Section 7.2.7 $PM_{2.5}$ Manual Minimum Monitoring Requirements- QA Collocation..... 7-8
Section 7.2.8 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Summary 7-8
Section 7.3 $PM_{2.5}$ Continuous Minimum Monitoring Requirements..... 7-9
Section 7.3.1 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Ambient..... 7-9
Section 7.3.2 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation with Manual Sampler..... 7-9
Section 7.3.3 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-NCore 7-10
Section 7.3.4 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation 7-10
Section 7.3.4.1 $PM_{2.5}$ Continuous Minimum Monitoring Requirements- Collocation with Manual 7-10
Section 7.3.4.2 $PM_{2.5}$ Continuous Minimum Monitoring Requirements- QA Collocation with Continuous 7-10
Section 7.3.5 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Summary 7-11
Section 7.4 $PM_{2.5}$ Speciation Minimum Monitoring Requirements 7-11
Section 7.4.1 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Ambient 7-11

Section 7.4.2 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-NCore 7-11
Section 7.4.3 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Summary 7-12
Section 7.5 $PM_{2.5}$ Suitability for Comparison to the NAAQS 7-12
Section 7.5.1 $PM_{2.5}$ Manual Suitability for Comparison to the NAAQS 7-12
Section 7.5.2 $PM_{2.5}$ Continuous Unsuitability for Comparison to the NAAQS 7-12
Section 7.5.3 $PM_{2.5}$ Speciation Unsuitability for Comparison to the NAAQS 7-13
Section 7.6 $PM_{2.5}$ Manual Operating Schedule 7-13
Section 7.7 $PM_{2.5}$ Manual Concentrations for San Diego 7-15
Section 7.7.1 $PM_{2.5}$ Manual Concentrations for San Diego-for the Last 20 Years 7-15
Section 7.7.2 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Year 7-16
Section 7.7.3 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (24-Hr) 7-17
Section 7.7.4 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (Annual Average) 7-18
Section 7.8 $PM_{2.5}$ Continuous Concentrations for San Diego 7-19
Section 7.8.1 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average) 7-19
Section 7.8.2 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average) 7-20
CHAPTER 8: PARTICULATE MATTER 10 µM (PM_{10}) 8-1
Section 8.1 PM_{10} Introduction 8-1
Section 8.2 PM_{10} Minimum Monitoring Requirements 8-3
Section 8.2.1 PM_{10} Minimum Monitoring Requirements-Ambient 8-3
Section 8.2.2 PM_{10} Minimum Monitoring Requirements-NCore 8-4
Section 8.2.3 PM_{10} Manual Minimum Monitoring Requirements-QA Collocation 8-4
Section 8.2.4 PM_{10} Minimum Monitoring Requirements-Summary 8-4
Section 8.3 PM_{10} Suitability for Comparison to the NAAQS 8-5
Section 8.3.1 PM_{10} Suitability for Comparison to the NAAQS - Equipment & Siting 8-5
Section 8.3.2 PM_{10} Suitability for Comparison to the NAAQS - Sampling Frequency 8-5
Section 8.4 PM_{10} Concentrations for San Diego 8-6
Section 8.4.1 PM_{10} Concentrations for San Diego-for the Last 20 Years 8-6
Section 8.4.2 PM_{10} Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year (24-Hr & Annual Average) 8-7
Section 8.4.3 PM_{10} Concentrations for San Diego - by Site at Local Conditions (LC) for the Year 8-8
CHAPTER 9: NATIONAL CORE (NCORE) 9-1
Section 9.1 NCore Introduction 9-1
Section 9.1.1 NCore Minimum Monitoring Requirements 9-2
Section 9.1.2 PM_{10} Minimum Monitoring Requirements-Ambient 9-2
Section 9.2 NCore Suitability for Comparison to the NAAQS 9-3
Section 9.3 NCore Concentrations 9-4
CHAPTER 10: PHOTOCHEMICAL ASSESSMENT MONITORING STATIONS (PAMS) 10-1
Section 10.1 PAMS Introduction 10-1
Section 10.2 PAMS Minimum Monitoring Requirements 10-3
Section 10.2.1 PAMS Minimum Monitoring Requirements-Equipment 10-3
Section 10.2.2 PAMS Minimum Monitoring Requirements-Waivers 10-4
Section 10.2.3 PAMS Minimum Monitoring Requirements-Sampling Season 10-5

Section 10.3 PAMS Sampling Frequency & Equipment 10-5
CHAPTER 11: TOXICS PROGRAM 11-1
Section 11.1 Toxics Introduction 11-1
Section 11.2 Toxics Minimum Monitoring Requirements 11-3
Section 11.3 Toxics Sampling Frequency & Equipment Used 11-3
APPENDICES
APPENDIX A: SITE DESCRIPTION INTRODUCTION A-1
APPENDIX B: ALPINE STATION DESCRIPTION B-1
APPENDIX C: CAMP PENDLETON STATION DESCRIPTION C-1
APPENDIX D: CHULA VISTA STATION DESCRIPTION D-1
APPENDIX E: DONOVAN STATION DESCRIPTION E-1
APPENDIX F: KEARNY VILLA ROAD STATION DESCRIPTION F-1
APPENDIX G: LEXINGTON ELEMENTARY SCHOOL STATION DESCRIPTION G-1
APPENDIX H: RANCHO CARMEL DRIVE STATION DESCRIPTION H-1
APPENDIX I: MCCLEAN PALOMAR AIRPORT STATION DESCRIPTION I-1
APPENDIX J: SHERMAN ELEMENTARY SCHOOL STATION DESCRIPTION J-1

List of Tables

Table 1-1 List of Network Sites 1-2
Table 1-2 Air Monitoring Sites with Associated Monitors/Samplers & Sample Frequency 1-4
Table 1-3 Gaseous Pollutants Monitoring Network 1-7
Table 1-4 Lead Sampling Network 1-8
Table 1-5 $PM_{2.5}$ Sampling Network 1-9
Table 1-6 PM_{10} Sampling Network 1-10
Table 1-7 PAMS Sampling Network* 1-11
Table 1-8 Toxics Monitoring Network 1-12
Table 1-9 Summary of Minimum Monitoring Requirements 1-14
Table 2-1 Ozone State and Federal Standards for the Year 2-1
Table 2-2 Ozone Monitoring Network 2-2
Table 2-3 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr) 2-3
Table 2-4 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value 2-4
Table 2-5 Ozone Minimum Monitoring Requirements-Ozone Sampling Season 2-4
Table 2-6 Ozone Minimum Monitoring Requirements-PAMS 2-5
Table 2-7 Ozone Minimum Monitoring Requirements-Summary 2-5
Table 2-8 Ozone Suitability for Comparison to the NAAQS- Sampling Equipment 2-6
Table 2-9 Ozone Concentrations for San Diego-for the Last 20 Years, 1999-2019 2-6
Table 2-10 Ozone Concentrations for San Diego-by Site for the Year, 2019 2-7
Table 2-11 Ozone Concentrations for San Diego-by Site for Design Value, 2017-2019 2-8
Table 3-1 Nitrogen Dioxide State and National Standards for the Year* 3-1
Table 3-2 Nitrogen Dioxide & Reactive Oxides of Nitrogen Monitoring Network 3-2
Table 3-3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road 3-3
Table 3-4 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site) Matrix 3-4
Table 3-5 Common Air Pollution Related Health Issues in the South Region of San Diego 3-6
Table 3-6 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary) 3-7
Table 3-7 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide 3-7
Table 3-8 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator 3-8
Table 3-9 Minimum Monitoring Requirements for true-NO_2, PAMS 3-8
Table 3-10 Reactive Oxides of Nitrogen Minimum Monitoring Requirements-PAMS & NCore 3-9
Table 3-11 NO_2, true-NO_2, & NO_y Minimum Monitoring Requirements-Summary 3-9
Table 3-12 Nitrogen Dioxide & Reactive Oxides of Nitrogen Sampling Equipment 3-10
Table 3-13 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years, 1999-2019 3-10
Table 3-14 Nitrogen Dioxide Concentrations for San Diego- by Site for the Year, 2019 3-11
Table 3-15 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value, 2017-2019 3-12
Table 4-1 Carbon Monoxide State and National Standards for the Year 4-1
Table 4-2 Carbon Monoxide Monitoring Network 4-2
Table 4-3 Carbon Monoxide Minimum Monitoring Requirements-Near-road 4-3
Table 4-4 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator 4-3
Table 4-5 Carbon Monoxide Minimum Monitoring Requirements-NCore 4-4
Table 4-6 Carbon Monoxide Minimum Monitoring Requirements-State (SIP) 4-4
Table 4-7 Carbon Monoxide Minimum Monitoring Requirements-Summary 4-4
Table 4-8 Carbon Monoxide Suitability for Comparison to the NAAQS-Sampling Equipment 4-5
Table 4-9 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years, 1999-2019 4-5

Table 4-10 Carbon Monoxide Concentrations for San Diego-by Site for the Year, 2019 4-6
Table 5-1 Sulfur Dioxide State and National Standards for the Year..... 5-1
Table 5-2 Sulfur Dioxide Monitoring Network 5-2
Table 5-3 Sulfur Dioxide Minimum Monitoring Requirements-NCore 5-3
Table 5-4 Sulfur Dioxide Minimum Monitoring Requirements - EPA NEI SO_2 5-4
Table 5-5 Sulfur Dioxide Minimum Monitoring Requirements-Ambient 5-4
Table 5-6 Sulfur Dioxide Minimum Monitoring Requirements-Summary 5-4
Table 5-7 Sulfur Dioxide Suitability for Comparison to the NAAQS-Sampling Equipment 5-5
Table 5-8 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years, 1999-2019 5-5
Table 5-9 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value, 2017-2019 5-6
Table 6-1 Lead State and National Standards for the Year 6-1
Table 6-2 Lead Sampling Network (regulatory collection and analysis) 6-2
Table 6-3 Lead Minimum Monitoring Requirements-Source (non-Airport) based on the NEI..... 6-3
Table 6-4 Lead Minimum Monitoring Requirements-Source (Airport) based on the NEI 6-3
Table 6-5 Lead Minimum Monitoring Requirements - Airport (Special Study) Results 6-4
Table 6-6 Lead Minimum Monitoring Requirements-Regional Administrator 6-5
Table 6-7 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA 6-5
Table 6-8 Lead Minimum Monitoring Requirements-Summary 6-5
Table 6-9 Lead Suitability for Comparison to the NAAQS-Sampling Equipment 6-6
Table 6-10 Lead Suitability for Comparison to the NAAQS-Sampling Equipment 6-6
Table 6-11 Lead Concentrations for San Diego-for the Last 20 Years, 1999-2019 6-7
Table 6-12 Lead Concentrations for San Diego-by Site for the Year..... 6-8
Table 7-1 $PM_{2.5}$ State and National Standards for the Year..... 7-1
Table 7-2 $PM_{2.5}$ Sampling Network 7-2
Table 7-3 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Design Criteria (Annual Average)..... 7-4
Table 7-4 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Design Criteria (24-Hr)..... 7-5
Table 7-5 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Ambient 7-5
Table 7-6 $PM_{2.5}$ Manual Minimum Monitoring Requirements- State (SIP) 7-5
Table 7-7 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (Annual Average) & 24-Hr 7-6
Table 7-8 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Near-road 7-6
Table 7-9 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Poor Air Quality..... 7-7
Table 7-10 $PM_{2.5}$ Manual Minimum Monitoring Requirements-NCore..... 7-7
Table 7-11 $PM_{2.5}$ Manual Minimum Monitoring Requirements- QA Collocation..... 7-8
Table 7-12 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Summary..... 7-8
Table 7-13 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Ambient 7-9
Table 7-14 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation with Manual Sampler 7-9
Table 7-15 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-NCore 7-10
Table 7-16 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation 7-10
Table 7-17 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Summary 7-11
Table 7-18 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Ambient..... 7-11
Table 7-19 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-NCore 7-12
Table 7-20 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Summary 7-12
Table 7-21 $PM_{2.5}$ Manual Suitability for Comparison to the NAAQS – Sampling Equipment..... 7-12
Table 7-22 $PM_{2.5}$ Continuous Unsuitability for Comparison to the NAAQS – Sampling Equipment.. 7-13

Table 7-23 $PM_{2.5}$ Speciation Unsuitability for Comparison to the NAAQS – Sampling Equipment.... 7-13
Table 7-24 $PM_{2.5}$ Operating Schedule-for All $PM_{2.5}$ Instruments 7-14
Table 7-25 $PM_{2.5}$ Manual Operating Schedule-for Manual Samplers Collocated with Continuous Samplers (DV-24-hr) 7-14
Table 7-26 $PM_{2.5}$ Manual Operating Schedule-NCore 7-14
Table 7-27 $PM_{2.5}$ Speciation Operating Schedule-NCore 7-14
Table 7-28 $PM_{2.5}$ Manual Concentrations for San Diego-for the Last 20 Years (24-Hr), 1999-2019... 7-15
Table 7-29 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2019..... 7-16
Table 7-30 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (24-Hr), 2017-2019..... 7-17
Table 7-31 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (Annual Average), 2017-2019 7-18
Table 7-32 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2019..... 7-19
Table 7-33 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average), 2017-2019..... 7-20
Table 8-1 PM_{10} State and National Standards for the Year 8-1
Table 8-2 PM_{10} Sampling Network 8-2
Table 8-3 PM_{10} Minimum Monitoring Requirement-Design Criteria for the Year (24-Hr) 8-3
Table 8-4 PM_{10} Minimum Monitoring Requirements-Ambient 8-3
Table 8-5 PM_{10} Minimum Monitoring Requirements-NCore 8-4
Table 8-6 PM_{10} Manual Minimum Monitoring Requirements-Collocation 8-4
Table 8-7 PM_{10} Minimum Monitoring Requirements-Summary 8-4
Table 8-8 PM_{10} Suitability for Comparison to the NAAQS, Equipment & Siting..... 8-5
Table 8-9 PM_{10} Suitability for Comparison to the NAAQS - Sampling Frequency..... 8-5
Table 8-10 PM_{10} Concentrations for San Diego - for the Last 20 Years, 1999-2019..... 8-6
Table 8-11 PM_{10} Concentrations for San Diego-by Site at Standard Conditions (STD) for the Year, 2019 8-7
Table 8-12 PM_{10} Concentrations for San Diego - by Site at Local Conditions (LC) for the Year, 2019 8-8
Table 9-1 NCore Minimum Monitoring Requirements-Equipment & Summary 9-2
Table 9-2 NCore Suitability for Comparison to the NAAQS-Frequency & Equipment..... 9-3
Table 9-3 NCore Concentrations for $PM_{10-2.5}$ (PMcoarse) 9-4
Table 9-4 NCore Concentrations for CO-TLE 9-4
Table 9-5 NCore Concentrations for SO_2-TLE 9-4
Table 9-6 NCore Concentrations for NO_y-NO 9-4
Table 9-7 NCore Concentrations for NO_2 9-4
Table 10-1 PAMS Sampling Network..... 10-2
Table 10-2 PAMS Minimum Sampling Requirements-Equipment & Summary 10-4
Table 10-3 PAMS Minimum Monitoring Requirements-Waivers 10-4
Table 10-4 PAMS Minimum Monitoring Requirements-Minimum Sampling Season..... 10-5
Table 10-5 PAMS Sampling Equipment 10-5
Table 10-6 PAMS VOC Parameter Codes..... 10-6
Table 10-7 PAMS Carbonyls..... 10-6
Table 11-1 Toxics Sampling Network..... 11-2
Table 11-2 Toxics Equipment..... 11-3

Table 11-3 Toxics VOC 11-3
Table 11-4 Carbonyls 11-4
Table 11-5 Metals 11-4
Table A-1 Relationship between Site Types and Scales or Representativeness A-1
Table A-2 Summary of Definitions in the Site Description Template A-2
Table A-3 Summary of Probe Monitoring Paths A-3
Table B-1 General Site Information B-1
Table B-2 Alpine - Gaseous Pollutants Monitor Designations + Other B-2
Table B-3 Alpine - Particulate Pollutants Monitor Designations B-3
Table B-4 Alpine - Meteorology Equipment Designations + Other B-4
Table B-5 Alpine - Distance the Equipment are from Influences B-5
Table C-1 General Site Information C-1
Table C-2 Camp Pendleton - Gaseous Pollutants Monitor Designations + Other C-2
Table C-3 Camp Pendleton - Particulate Pollutants Monitor Designations C-3
Table C-4 Camp Pendleton - Distance the Equipment are from Influences C-5
Table D-1 General Site Information D-1
Table D-2 Chula Vista - Gaseous Pollutants Monitor Designations + Other D-2
Table D-3 Chula Vista - Particulate Pollutants Monitor Designations D-3
Table D-4 Chula Vista - Other Pollutants Monitor Designations D-4
Table D-5 Chula Vista - Meteorological Equipment Designations + Other D-5
Table D-6 Chula Vista - Distance the Equipment are from Influences D-6
Table E-1 General Site Information E-1
Table E-2 Donovan - Gaseous Pollutants Monitor Designations + Other E-2
Table E-3 Donovan - Particulate Pollutants Monitor Designations E-3
Table E-4 Donovan - Other Pollutants Monitor Designations E-4
Table E-5 Donovan - Meteorological Equipment Monitor Designations + Other E-5
Table E-6 Donovan - Distance the Equipment are from Influences E-6
Table F-1 General Site Information F-1
Table F-2 Kearny Villa Road - Gaseous Pollutants Monitor Designations + Other F-2
Table F-3 Kearny Villa Road - Particulate Pollutants Monitor Designations F-3
Table F-4 Kearny Villa Road - Meteorological Equipment Designations + Other F-4
Table F-5 Kearny Villa Road - Meteorological Equipment (Additional) Designations F-5
Table F-6 Kearny Villa Road - Distance the Equipment are from Influences F-6
Table G-1 General Site Information G-1
Table G-2 Lexington Elementary School - Gaseous Pollutants Monitor Designations + Other G-2
Table G-3 Lexington Elementary School - Particulate Pollutants Monitor Designations G-3
Table G-4 Lexington Elementary School - Other Pollutants Monitor Designations G-4
Table G-5 Lexington Elementary School - Meteorological Equipment Monitor Designations + Other G-5
Table G-6 Lexington Elementary School - Distance the Equipment are from Influences G-6
Table H-1 General Site Information H-1
Table H-2 Rancho Carmel Drive - Gaseous Pollutants Monitor Designations + Other H-2
Table H-3 Rancho Carmel Drive - Particulate Pollutants Monitor Designations H-3
Table H-4 Rancho Carmel Drive - Meteorological Equipment Designations + Other H-4
Table H-5 Rancho Carmel Drive - Distance the Equipment are from Influences H-5
Table I-1 General Site Information I-1

Table I-2 Palomar Airport - Particulate Pollutants Monitor Designations I-2
Table I-3 Palomar Airport - Distance the Equipment are from Influences.....I-3
Table J-1 General Site Information..... J-1
Table J-2 Sherman Elementary School - Gaseous Pollutants Monitor Designations + Other J-2
Table J-3 Sherman Elementary School - Particulate Pollutants Monitor Designations J-3
Table J-4 Sherman Elementary School - Meteorological Equipment Designations + Other J-4
Table J-5 Sherman Elementary School - Distance the Equipment are from Influences..... J-5

List of Figures

Figure 1.1 San Diego APCD Air Quality Monitoring Network 1-3
Figure 2.1 Ozone Network Map 2-1
Figure 2.2 Ozone Concentrations for San Diego-for the Last 20 Years Graph 2-6
Figure 2.3 Ozone Concentrations for San Diego-by Site for the Year Graph 2-7
Figure 2.4 Ozone Concentrations for San Diego-by Site for Design Value Graph 2-8
Figure 3.1 Nitrogen Dioxide & NO_y Network Map 3-1
Figure 3.2 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years Graph 3-10
Figure 3.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year Graph 3-11
Figure 3.4 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value Graph 3-12
Figure 4.1 Carbon Monoxide Network Map 4-1
Figure 4.2 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years Graph 4-5
Figure 4.3 Carbon Monoxide Concentrations for San Diego-by Site for the Year Graph 4-6
Figure 5.1 Sulfur Dioxide Network Map 5-1
Figure 5.2 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years Graph 5-5
Figure 5.3 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value Graph 5-6
Figure 6.1 Lead Network Map 6-1
Figure 6.2 Lead Concentrations for San Diego-for the Last 20 Years 6-7
Figure 6.3 Lead Concentrations for San Diego-by Site for the Year Graph 6-8
Figure 7.1 $PM_{2.5}$ Network Map 7-1
Figure 7.2 PM2.5 Manual Concentrations for San Diego-for the Last 20 Years (24-Hr) Graph 7-15
Figure 7.3 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average) Graph 7-16
Figure 7.4 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (24-Hr) Graph 7-17
Figure 7.5 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (Annual Average) Graph 7-18
Figure 7.6 $PM_{2.5}$ Continuous Yearly 24-Hr & Annual Average Measurements by Site Graph 7-19
Figure 7.7 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average) Graph 7-20
Figure 8.1 PM_{10} Overall Map 8-1
Figure 8.2 PM_{10} Concentrations for San Diego-for the Last 20 Years Graph 8-6
Figure 8.3 PM_{10} Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year ... 8-7
Figure 8.4 PM_{10} Concentrations for San Diego - by Site at Local Conditions (LC) for the Year Graph (24-Hr & Annual Average) 8-8
Figure 9.1 NCore Network Map 9-1
Figure 10.1 PAMS (Carbonyls and VOCs) Network Map 10-1
Figure 11.1 Toxics Network Map 11-1
Figure A.1 Distance of PM samplers to nearest traffic lane A-4
Figure B.1 Alpine – Picture of the Location of the Station B-1
Figure B.2 Alpine – Pictures (Directional) from the Rooftop B-6
Figure C.1 Camp Pendleton – Picture of the Location of the Station C-1
Figure C.2 Camp Pendleton – Pictures (Directional) from the Rooftop C-6
Figure D.1 Chula Vista – Pictures of the Location of the Station D-1
Figure D.2 Chula Vista – Pictures (Directional) from the Ground D-7
Figure E.1 Donovan – Picture of the Location E-1
Figure E.2 Donovan – Pictures (Directional) from the Rooftop E-7

Figure F.1 Kearny Villa Road – Picture of the Location F-1
Figure F.2 Kearny Villa Road – Pictures (Directional) from the Rooftop F-7
Figure G.1 Lexington Elementary School – Picture of the Location G-1
Figure G.2 Lexington Elementary School – Pictures (Directional) from the Rooftop G-7
Figure H.1 Rancho Carmel Drive - Picture of the Location of the Station H-1
Figure H.2 Rancho Carmel Drive– Pictures (Directional) from the Ground* H-6
Figure I.1 Palomar Airport – Picture of the Location I-1
Figure I.2 Palomar Airport – Pictures (Directional) from the Ground* I-4
Figure J.1 Sherman Elementary School – Picture of the Location J-1
Figure J.2 Sherman Elementary – Pictures (Directional) form the rooftop J-6

Chapter 0: Annual Network Plan Requirements

Section 0.1 Federal Citation

In 2007, the U.S. Environmental Protection Agency (EPA) finalized amendments to the ambient air monitoring regulations. These amendments: revised the technical requirements for certain types of sites, programs, and analyzers; added pollutants and programs; and, specified sampling frequencies. Monitoring agencies are required to submit annual monitoring network plans, conduct network assessments every five years, perform quality assurance activities, and, in certain instances, establish new monitoring programs. The regulations from Title 40, Part 58, Section 10(a) of the Code of Federal Regulations (40 CFR 58.10, (a)(1)) state that:

> *The State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.*

This document is prepared and submitted as partial fulfillment of these requirements. It describes the network of ambient air quality monitors, samplers, and analyzers operated by San Diego Air Pollution Control District (District) staff in fulfillment of EPA regulations governing network compliance that are updated every July 1. This annual comprehensive review serves to evaluate whether the current monitoring strategies are meeting the needs of the District, to determine compliance with all current Federal, State, and Local regulations and to aid in the development of future monitoring strategies and decisions. It also serves to identify and report needs for additions, relocations, or terminations of monitoring sites or instrumentation.

Section 0.2 Purpose, Scope, and Organization of Annual Network Plan

In San Diego County, there are several locations where the ambient air quality is routinely measured for air pollutants. These sites are operated by the District. The measured data provide the public with information on the status of the air quality and the progress being made to improve air quality. The data can be used by health researchers, business interests, environmental groups, and others.

This report describes the network of ambient air quality monitors within the San Diego Air Basin (SDAB) and meets the requirements for an annual network plan as listed in Title 40 of the Code of Federal Regulations (CFR), Part 58.10. The 40 CFR 58.10 require that the report be submitted to the EPA, including any public comments, by July 1, of each year.

As required by the CFR, this report includes equipment which have federal reference methods (FRM) or federal equivalent methods (FEM) designations. While the CFR also requires reporting of approved regional methods (ARM), no ARMs are in operation in San Diego County at this time. The terms FRM and FEM denote monitoring instruments that produce measurements of the ambient pollution levels (or concentrations) that the regulations allow to be compared to the ambient air quality standards for regulatory purposes. This report also includes information regarding non-regulatory and non-criteria pollutant monitoring.

Section 0.3 Public Comments Information

Pursuant to Federal regulations, the draft report was available for a minimum of 30 days for public inspection period. Notice of availability of the report was posted on the District's website (www.sdapcd.org), at least 30 days prior to EPA submission. Comments regarding this report and the District response(s) before submittal to EPA are listed in the Executive Summary chapter (there were no comments). Any comments regarding this report and answered by the District after submittal to the EPA, will be forwarded to EPA Region 9 headquarters.

Please submit any comments in writing to David Medina, Senior Chemist, Ambient Air Quality Section, david.medina@sdcounty.ca.gov, or mail/deliver to District headquarters at David Medina c/o San Diego Air Pollution Control District, 10124 Old Grove Road, San Diego, CA, 92131.

Section 0.3.1 District Contact Information

For information regarding this report, air monitoring stations, laboratory operations, field and laboratory equipment, quality control and quality assurance procedures of the field and laboratory equipment, or general oversight of the monitoring program contact: David Medina, Senior Chemist, Ambient Air Quality Section, david.medina@sdcounty.ca.gov, (858) 586-2780.

For information about daily field operations regarding the equipment at the stations, contact: David Craig, Supervisor of Technicians, Electronic Technicians section, david.craig@sdcounty.ca.gov, (858) 586-2785.

For information regarding ambient air quality data, meteorological data, episode modeling, air quality forecasting, and smoke management plans contact: Bill Brick, Chief of Monitoring & Technical Services, Bill.Brick@sdcounty.ca.gov , (858) 586-2770.

Section 0.3.2 Additional Air Pollution Information

Additional information regarding San Diego's ambient air quality monitoring network, including pollutant data summaries for the various monitors in the network, are available from a variety of sources. This section lists a number of additional sources for related information.

Similar information is available on EPA and CARB websites, but the links to these locations change frequently. Key words to search at their website are: National Ambient Air Quality Standards, Fine Particle ($PM_{2.5}$) Designations, The Plain English Guide to the Clean Air Act, About Air Toxics, Health and Ecological Effects, Air Trends, PAMS Information, Green House Gases, Stratospheric Ozone, as well as the name of the chapters of this document, etc.

Likewise, the ARB's Monitoring and Laboratory Division (MLD) maintains web pages with information about all the existing monitoring sites that routinely monitor and submit air quality data in California. These web pages also include detailed local maps showing the location of the sites. This information can be found at http://www.arb.ca.gov/aaqm/mldaqsb/amn.htm. A more general MLD web page that provides links to other aspects of ambient monitoring is located at http://www.arb.ca.gov/aaqm/aaqm.htm.

ARB's annual network report contains listings of all the monitoring sites in the State, along with the years for which the data are available for each monitor/sampler in California. Summaries of the official air quality data from sites around the State can be found at: http://www.arb.ca.gov/adam/welcome.html. Pollution data is available on the District's website (http://www.sdapcd.org/). Other helpful websites to visit are: http://airnow.gov/, and at https://aqs.epa.gov/aqsweb/documents/data_mart_welcome.html.

Section 0.4 Description of Monitoring

This document details the current monitoring network in the SDAB for the criteria pollutants, monitoring programs, and site detail the District must report, and they are below:

Monitoring Programs	Criteria Pollutants	Site Information
-National Core (NCore)	-Ozone (O_3)	-Site Location
-Speciation Trends Network (STN)	-Nitrogen Dioxide (NO_2)	-Site Type
-Chemical Speciation Network (CSN)	-Carbon Monoxide (CO)	-Site Objective
-Special Purpose Monitoring (SPM)	-Sulfur Dioxide (SO_2)	-Spatial Scale
-Near-road	-Lead (Pb)	-Sampling Schedule
-Border 2020	-Particulate Matter (PM)	-Equipment
-Toxics		-Sampling Method
-Photochemical Assessment Monitoring Stations (PAMS)		-Monitor Objective

Section 0.4.1 Network Design Theory

Ambient air monitoring networks (Network) are designed to fulfill several criteria. A general summary of the criteria are below.

Network Design Objectives

1. Provide data to the public in a timely manner.
2. Support compliance with NAAQS and emissions strategy development.
3. Support air pollution research studies.

Logistical

1. Minimal interference and perturbation of wind flow by obstacles.
2. Proximity to headquarters.
3. Availability of power and communications.
4. Cost of site lease, relocation, or new deployment, site improvements, e.g. fence, road, etc.
5. Safety, security, and accessibility.
6. Flat, level footprint for shelter, platforms, and concrete pad.
7. Gravel or paved road access.

Other

1. Funding.
2. Staffing.
3. Drive time from location to location (congestion patterns).
4. Longevity of the site location.
5. Buildup of the area surrounding the location.
6. Proximity to other monitors.
7. Homogeneity in space and with respect to speciation.
8. Devoid of source influences (point sources, mobile sources, etc.).

Section 0.5 San Diego Air Basin Description

The San Diego Air Basin (SDAB) covers roughly 4,200 square miles, lies in the southwest corner of California, and encompasses all of San Diego County and included part of the Salton Sea Air Basin. The population and emissions are concentrated mainly in the western portion of the County.

Section 0.5.1 San Diego Topography

The topography of San Diego County is highly varied, being comprised of coastal plains and lagoons, flatlands and mesas, broad valleys, canyons, foothills, mountains, and deserts. Generally, building structures are on the flatlands, mesas, and valleys, while the canyons and foothills tend to be sparsely developed. This segmentation is what has carved the region into a conglomeration of separate cities that led to low density housing and an automobile-centric environment.
The topography of San Diego County is quite diverse. To the west of San Diego are the beaches and the Pacific Ocean, to the south is Tijuana, Mexico and the Baja California Peninsula, to the near east are the mountains, to the far east is the desert (the Salton Sea Air Basin), and to the north is the South Coast Air Basin (the greater Los Angeles-Riverside-San Bernardino area/Air Basin).

The topography also drives the pollutant levels. The SDAB is not classified as a contributor, but it is classified as a transport recipient. The transport recipient pollutants are O_3, NO_x and Volatile Organic Compounds (VOCs), that are transported from the South Coast Air Basin from the north and, when the wind shifts direction, Tijuana, Mexico, from the south.

Section 0.5.2 San Diego Climate

The climate is classified as Mediterranean but is diverse because of the topography. The climate is dominated by the Pacific High-pressure system that results in mild, dry summers and mild, wet winters. San Diego experiences about 201 days above 70°F and 9-13" of rainfall annually (mostly, November - March). El Niño and La Niña patterns have large effects on the annual rainfall received in San Diego.

An El Niño is a warming of the surface waters of the eastern Pacific Ocean. It is a climate pattern that occurs across the tropical Pacific Ocean that is associated with drastic weather occurrences, including enhanced rainfall in Southern California. La Niña is a term for cooler than normal sea surface temperatures across the Eastern Pacific Ocean. San Diego receives less than normal rainfall during La Niña years.

The Pacific High drives the prevailing winds in the SDAB. The winds tend to blow onshore in the daytime and offshore at night. In the summer, an inversion layer is created over the coastal areas and increases the O_3 levels. In the winter, San Diego often experiences a shallow inversion layer which tends to increase carbon monoxide and $PM_{2.5}$ concentration levels due to the increased use of residential wood burning.

In the fall months, the SDAB is often impacted by Santa Ana winds. These winds are the result of a high-pressure system over the Nevada-Utah region that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. These winds are powerful and incessant. They blow the air basin's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin and greatly increase the San Diego O_3 concentrations. A strong Santa Ana also primes the vegetation for firestorm conditions.

Section 0.5.3 Population

The most recent official U.S. census in 2020 listed the population of San Diego County at 3.3 million. The County population has been increasing by a growth rate of 0.46% for an estimated to be 3.3 million in 2019.

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Chapter 1: Overview of the Air Quality Monitoring Network

Section 1.1 Executive Summary of the Air Quality Monitoring Network

The District operated 9 monitoring sites that collected criteria pollutant data (Figure 1.1). The District's monitoring network has been designed to provide criteria pollutant monitoring coverage to the majority of the inhabited regions of the County (Table 1-1 & Table 1-2).

Since the San Diego County Air Pollution Control District was established by the County Board of Supervisors in 1955, occasional air monitoring has been performed in remote portions of the County, including the mountain and desert areas. Historical measurements have shown relatively low levels of air pollution in these areas. Population and growth in these areas have remained low enough that routine air sampling has not been necessary. Measurements have shown that harmful air contaminants are found in areas where population is dense, traffic patterns are heavy, and industrial sources are concentrated. As pollutants are carried inland by prevailing winds, they are frequently trapped against the mountain slopes by a temperature inversion layer, generally occurring between 1500 and 2500 feet above sea level. Therefore, our air monitoring stations are found between the coast and the mountain foothills up to approximately 2000 feet. The monitoring network needs to be large enough to cover the diverse range of topography, meteorology, emissions, and air quality in San Diego, while adequately representing the large population centers. This monitoring network plays a critical role in assessing San Diego County's clean air progress and in determining pollutant exposures throughout the County.

Ambient concentration data are collected for a wide variety of pollutants. The most important of these, in the San Diego Air Basin, are: ozone (O_3), fine particulate matter 2.5 micrometers and less in diameter (called $PM_{2.5}$), particulate matter 10 micrometers and less in diameter (called PM_{10}),, and a number of toxic compounds (metals, carbonyls, and Volatile Organic Compounds (VOCs)). Other pollutants measured include nitrogen dioxide (NO_2), total reactive oxides of Nitrogen (NOy), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb). Monitoring for meteorological parameters is also conducted at most monitoring locations. Data for all of the pollutants are needed to better understand the nature of the ambient air quality in San Diego County, as well as to inform the public regarding the quality of the air they breathe. Not all pollutants are monitored at all sites, but most sites monitor for multiple pollutants. A particular site's location and monitoring purpose determine the actual pollutants measured at that site.

A fundamental purpose of air monitoring is to distinguish between areas where pollutant levels exceed the ambient air quality standards and areas where those standards are not exceeded. Health-based ambient air quality standards are set at levels that preclude adverse impacts to human health (allowing for a margin of safety). The District develops strategies and regulations to achieve the emission reductions necessary to meet all health-based standards. Data from the ambient monitoring network are then used to indicate the success of the regulations and control strategies in terms of the rate of progress towards attaining the standards or to demonstrate that standards have been attained and maintained. Thus, there is an established feedback loop between the emission reduction programs and the ambient monitoring programs. Over the years, Federal, State, and District regulatory/strategic measures have proven to be extremely successful at reducing levels of harmful air contaminants. Monitors once placed throughout the County to document the frequent and regular exceedance of ozone, nitrogen dioxide, carbon monoxide, and particulate matter standards now document the continued downward concentration trends of these pollutants.

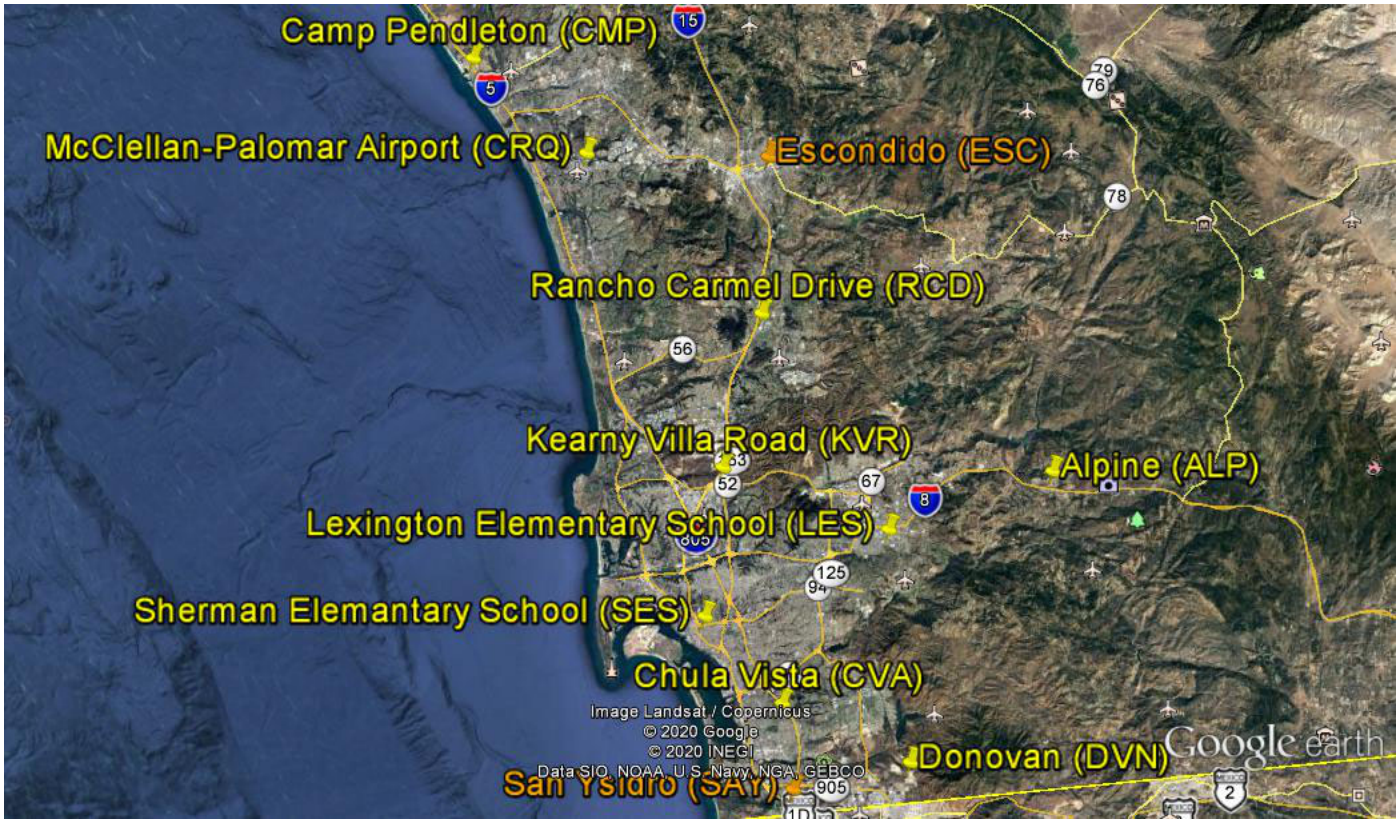
Section 1.1.1 Overview of the Pollutant Monitoring Network

This section lists all the monitoring locations in the SDAB undertaken by the District for this report year. Table 1-1 below is a list of the District's stations and their locations. Figure 1.1 shows where these monitoring locations are on a map of the County. Table 1-2 lists all the samplers, analyzers, and other instrumentation at these monitoring sites.

Table 1-1 List of Network Sites

Station Name	Station Abbreviation	Address	Latitude/ Longitude	AQS ID
Alpine	ALP	2300 W. Victoria Dr.	32.842312° -116.768277°	06-073-1006
Camp Pendleton	CMP	21441 W. B St.	33.217020° -117.396179°	06-073-1008
Chula Vista	CVA	84 E. J St.	32.631243° -117.059086°	06-073-0001
Donovan	DVN	480 Alta Rd.	32.578162° -116.921388°	06-073-1014
*Escondido	ESC	600 E. Valley Pkwy.	33.127765° -117.075093°	06-073-1002
Kearny Villa Rd.	KVR	6125A Kearny Villa Rd.	32.845713° -117.123979°	06-073-1016
Lexington Elementary School	LES	533 B. First St.	32.789569° -116.944308°	06-073-1022
McClellan-Palomar Airport	CRQ	2192 Palomar Airport Rd.	33.130898° -117.272392°	06-073-1023
Rancho Carmel Dr. (1st Near-road Site)	RCD	11403 Rancho Carmel Dr.	32.985428° -117.082213°	06-073-1017
*San Ysidro (2nd Near-road Site)	SAY	198 W. San Ysidro Blvd.	32.552809° -117.047328°	06-073-1025
Sherman Elementary School	SES	450B 24th St.	32.710177° -117.142665°	06-073-1026

*Orange= Under construction



Orange= Under construction

Figure 1.1 San Diego APCD Air Quality Monitoring Network

Table 1-2 Air Monitoring Sites with Associated Monitors/Samplers & Sample Frequency

		ALP Alpine	**CMP** Camp Pendleton	**CVA** Chula Vista	**DVN** Donovan	**LES** Lexington Elementary School	**KVR** Kearny Villa Rd.	**CRQ** Palomar Airport	**RCD** Rancho Carmel Drive	**SES** Sherman Elementary School
AMBIENT	O_3	7/24	7/24	7/24	7/24	7/24	7/24			7/24
	NO_2	7/24	7/24	7/24	7/24	7/24	7/24		7/24	7/24
	CO								7/24	
NCORE	NOy-TLE					7/24				
	CO-TLE					7/24				
	SO_2-TLE					7/24				
LEAD	(Airports) (Hi-Vol)							1:6		
PM_{10}	(Manual)			1:6	1:6	1:6				
$PM_{2.5}$ n-FEM	(non-FEM Continuous)	7/24	7/24		7/24	7/24				7/24
$PM_{2.5}$ FRM	(Manual)			1:3		1:1	1:3		1:3	1:3
$PM_{2.5}$ CSN	(Speciation)					1:3				
$PM_{2.5}$ STN	Channel 1 (Metals)					1:3				
	Channel 2 (Inorganic Ions)					1:3				
	Channel 3 (Wood Smoke)									
PAMS	(VOCs)					Not Active				
	(Carbonyls)					Not Active				
TOXICS CA-TAC (CARB)	(VOCs)			1:6		1:6				
	(Total Metals & Cr^{+6})			1:12		1:12				
	(Aldehydes/ Carbonyls)			1:6		1:6				
TOXICS (APCD)	(VOCs)				1:6					1:6
	(Total Metals)				1:6	1:6				1:6
	(Aldehydes/ Carbonyls)				1:6					1:6
METEROLOGICAL PARAMETERS & Others	Wind Speed./ Wind Direction	7/24	7/24	7/24	7/24	7/24	7/24			7/24
	External Temperature	7/24	7/24	7/24	7/24	7/24	7/24			7/24
	% Relative Humidity	7/24				7/24	7/24			
	Internal Temperature	7/24	7/24	7/24	7/24	7/24	7/24		7/24	7/24
	Barometric Pressure					7/24	7/24			
	Solar Radiation						7/24			
	Ultraviolet Radiation						Not Active			
	Precipitation						Not Active			

- Yellowed areas indicate a collocation of samplers to satisfy Federal QA requirements for $PM_{2.5}$ FRM monitors, PM_{10}, and TSP samplers with a sampling frequency of 1:6.
- The collocated $PM_{2.5}$ PAMS-VOCs sampler have the same sampling frequency as the main sampler.
- All sample times are set to Pacific Standard Time.
- The District operates, calibrates, and audits all instruments listed in Table 1-2, except for the CARB's Xontech 924's at the Chula Vista and El Cajon stations (operation only).
- Not all collected samples are analyzed by District personnel. Some samples are sent to the EPA or CARB laboratories for subsequent analysis. They are noted in Table 1-5 as EPA or CARB.
- CA TAC stands for the California Toxics Air Contaminant Monitoring network.

Sampling frequencies are designated as follows:

7/24= a sampler that operates continually with no media changes needed (Please note that a filter tape roll is used on the non-FEM Continuous BAM sampler and changed as needed).

1:1= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs daily for a duration of 24 hours. The media are manually loaded, collected, and programmed to run on a weekly basis.

1:3= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every three (3) days for a duration of 24 hours. The media are manually loaded, collected, and programmed in between sample days.

1:6= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every six (6) days for a duration of 24 hours. The media are manually loaded, collected, and programmed on a weekly basis

1:12= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every twelve (12) days for a duration of 24 hours. The media are manually loaded, collected, and programmed on a biweekly basis.

Tables 1-3 – 1-8 use the same Glossary (see below)

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 1.1.2 Overview of the Gaseous Pollutant Monitoring Network

Table 1-3 below is a summary of the criteria gaseous pollutants and NO_y monitoring network.

Table 1-3 Gaseous Pollutants Monitoring Network

Abbreviation		ALP	CMP	CVA	LES		KVR	DVN	RCD	SES
Name		Alpine	Camp Pendleton	Chula Vista	Lexington		Kearny Villa Rd	Donovan	Rancho Carmel Dr.	Sherman
AQS ID		06-073-1006	06-073-1008	06-073-0001	06-073-1022		06-073-1016	06-073-1014	06-073-1017	06-073-1026
O_3	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS		SLAMS	SLAMS		SLAMS
	Method	UV	UV	UV	UV		UV	UV		UV
	Affiliation	Not Applicable	Not Applicable	Not Applicable	PAMS, NCore		Not Applicable	Not Applicable		Not Applicable
	Spatial Scale	US	NS	NS	NS		NS	NS		NS
	Site Type	HC	PE	PE	PE		PE	PE		PE
	Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS		PI, NAAQS	PI, NAAQS		PI, NAAQS
	Equipment	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i		Thermo 49i	Thermo 49i		Thermo 49i
NO_2 & NOy	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Method	CL	CL	CL	CL	CL	CL	CL	CL	CL
	Affiliation	Not Applicable	Not Applicable	Not Applicable	PAMS	PAMS, NCore	Not Applicable	Not Applicable	NR	NR
	Spatial Scale	US	NS	NS	NS	NS	NS	NS	NS	NS
	Site Type	PE	PE	PE	PE	PE	PE	HC	PE	PE
	Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, Research	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS
	Equipment	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i-y	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i
CO	Monitor Type				SLAMS				SLAMS	
	Method				IR				IR	
	Affiliation				NCore				Not Applicable	
	Spatial Scale				NS				NS	
	Site Type				PE				PE	
	Objective (Federal)				PI, NAAQS				PI, NAAQS	
	Equipment				Thermo 48i-TLE				Thermo 48i-TLE	
SO_2	Monitor Type				SLAMS					
	Method				FL					
	Affiliation				NCore					
	Spatial Scale				NS					
	Site Type				PE					
	Objective (Federal)				PI, NAAQS					
	Equipment				Thermo 43i-TLE					

Section 1.1.3 Overview of the Pb-TSP Sampling Network

Table 1-4 below is a summary of the lead particulates sampling network (regulatory method only).

Table 1-4 Lead Sampling Network

Abbreviation		CRQ	
Name		Palomar Airport	
AQS ID		06-073-1023	
Lead	Monitor Type	SLAMS	SLAMS
	Designation	O	QAC
	Method	HV	HV
	Affiliation	Not Applicable	Not Applicable
	Spatial Scale	MI	MI
	Site Type	SO	QA
	Objective (Federal)	NAAQS	NAAQS
	Analysis	APCD	APCD
	Frequency	1:6	1:6
	Equipment	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+

Section 1.1.4 Overview of the $PM_{2.5}$ Sampling Network

Table 1-5 below is a summary of the $PM_{2.5}$ sampling network.

Table 1-5 $PM_{2.5}$ Sampling Network

Site Abbreviation		ALP	CMP	CVA	LES		KVR		DVN	SES		RCD
Site Name		Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School		Kearny Villa Rd		Donovan	Sherman Elementary School		Rancho Carmel Drive
AQS ID		06-073-1006	06-073-1008	06-073-0001	06-073-1022		06-073-1016		06-073-1014	06-073-1026		06-073-1017
$PM_{2.5}$ (non-speciated)	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Designation	O	O	PRI	O	PRI	PRI	QAC	O	O	PRI	PRI
	Method	CT (non-FEM)	CT (non-FEM)	SQ (FRM)	CT (non-FEM)	SQ (FRM)	SQ (FRM)	SQ (FRM)	CT (non-FEM)	CT (non-FEM)	SQ (FRM)	SQ (FRM)
	Affiliation	N/A	N/A	N/A	NCore	NCore	N/A	N/A	N/A	N/A	N/A	NR
	Spatial Scale	US	US	NS	US	NS	NS	NS	NS	NS	NS	MS
	Site Type	PE	PE	PE	PE	HC	PE	PE	PE	PE	PE	SO
	Objective (Federal)	PI, Research	PI, Research	NAAQS	PI, Research	NAAQS	NAAQS	NAAQS	PI, Research	PI, Research	NAAQS	NAAQS
	Analysis	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
	Frequency	7/24	7/24	1:3	7/24	1:3	1:3	1:6	7/24	7/24	1:3	1:3
	Equipment	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM	Met One BAM-1020	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM*	Met One E-SEQ-FRM
$PM_{2.5}$ (speciated)	Monitor Type				SLAMS	SLAMS						
	Method				SP & SQ	SP & SQ						
	Affiliation				NCORE, CSN, STN	NCORE, CSN, STN						
	Spatial Scale				NS	NS						
	Site Type				PE	PE						
	Objective (Federal)				Research	Research						
	Analysis				EPA	EPA						
	Frequency				1:3	1:3						
	Equipment				URG-3000N	Met One SuperSASS						

* Operational in 2020

Section 1.1.5 Overview of the PM_{10} Sampling Network

Table 1-6 below is a summary of the PM_{10} sampling network.

Table 1-6 PM_{10} Sampling Network

Abbreviation		CVA	DVN		KVR*	LES
Name		Chula Vista	Donovan		Kearny Villa Rd	Lexington
AQS ID		06-073-0001	06-073-1014		06-073-1016	06-073-1022
PM_{10}	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Designation	O	O	QAC	O	O
	Method	SI	SI	SI	SI	SP
	Affiliation	Not Applicable	Not Applicable	Not Applicable	Not Applicable	NCore
	Spatial Scale	NS	NS	NS	NS	NS
	Site Type	PE	HC	PE	PE	PE
	Objective (Federal)	NAAQS	NAAQS	NAAQS	NAAQS	NAAQS
	Frequency	1:6	1:6	1:6	1:6	1:6
	Equipment	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Met One E-SEQ-FRM w/o VSCC

*Sampler close-out audit performed on 03/13/2019. Last PM10 sample date on 12/28/2018.

Section 1.1.6 Overview of the PAMS Network

Table 1-7 below is a summary of the Photochemical Assessment Monitoring Stations (PAMS) network.

Table 1-7 PAMS Sampling Network*

Abbreviation		LES	
Name		Lexington	
AQS ID		06-073-1022	
PAMS	Monitor Type	SLAMS	SLAMS
	Method	Auto	Cartridges
	Affiliation	PAMS	PAMS
	Spatial Scale	NS	NS
	Site Type	PE	PE
	Objective (Federal)	Research	Research
	Analysis By	APCD	APCD
	Frequency	24/7	1:6
	Equipment	GC-FID	Atec 8000

*Official EPA start date June 1, 2021

Section 1.1.7 Overview of the TOXICS Monitoring Network

Table 1-8 below is a summary of the toxics monitoring network.

Table 1-8 Toxics Monitoring Network

Abbreviation		CVA				LES					DVN			SES		
Name		Chula Vista				Lexington					Donovan			Sherman		
AQS ID		06-073-0001				06-073-1022					06-073-1014			06-073-1026		
Toxics	Pollutant	Toxics-VOCs	Toxics-Metals	Toxics-Cr^{+6}	Toxics-Aldehydes/ Carbonyls	Toxics-VOCs	Toxics-Metals	Toxics-Cr^{+6}	Toxics-Aldehydes/ Carbonyls	Toxics-Metals	Toxics-VOCs	Toxics-Metals	Toxics-Aldehydes/ Carbonyls	Toxics-VOCs	Toxics-Metals	Toxics-Aldehydes/ Carbonyls
	Monitor Type	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Method	Canister	Filter	Filter	Cartridges	Canister	Filter	Filter	Cartridges	Filter	Canister	Filter	Cartridges	Canister	Filter	Cartridges
	Affiliation	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Spatial Scale	NS	NS	NS	NS	NS	NS	NS	NS	NS	MI	MI	MI	NS	NS	NS
	Site Type	PE	PE	PE	PE	PE	PE	PE	PE	PE	SO	SO	SO	PE	PE	PE
	Objective (Federal)	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research
	Analysis By	ARB	ARB	ARB	ARB	ARB	ARB	ARB	ARB	APCD	APCD	APCD	APCD	APCD	APCD	APCD
	Frequency	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:6	1:6	1:6	1:6	1:6	1:6	1:6
	Equipment	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	Xontech 924	Xontech 910A FSL	Xontech 924	Atec 8000	Xontech 910A FSL	Xontech 924	Atec 8000

Section 1.2 Summary of the Minimum Monitoring Requirements for the SDAB

The EPA regulations specify the minimum number of sites at which State and Local air agencies must deploy monitors. The State and Local agencies generally find they need to deploy more monitors than are minimally required to fulfill State and Local purposes for monitoring. For example, often California air quality standards are more stringent than National standards, so many areas need more monitors than required by the EPA to show compliance with both State and National standards.

For pollutants monitoring, the minimum requirements for the number of monitors are in the 40 CFR 58, Appendix D "Network Design Criteria for Ambient Air Quality Monitoring". Each pollutant or monitoring program has different requirements for determining the minimum number of monitors needed for a Metropolitan Statistical Area (MSA) and the requirements can change yearly. The County of San Diego encompasses the San Diego County air basin and part of the Salton Sea air basin, as outlined by the California Air Resources Board. Some pollutants have additional monitoring requirements associated with them, e.g. $PM_{2.5}$ monitoring has requirements for continuous and sequential monitors. This section summarizes the minimum monitoring requirements from the criteria pollutant chapters in this report. For greater detail, refer to the specific pollutant's chapter.

Note: when the number of monitors required is based on the MSA population, it is taken from the latest U.S. Census. In the non-Census years, the MSA population is extrapolated by the San Diego Association of Governments (SANDAG) and that number is used by the District.

The U.S. EPA regulations specify the minimum number of samplers and monitors (aka analyzers) needed for ambient air monitoring, including those required for collocation. These numbers vary annually, by program, and by within each pollutant. Table 1-1 summarizes these totals listed in the subsequent chapters. Much of this equipment overlaps and can serve multiple functions and/or programs. For example, there are two different requirements for the NOy analyzer: one for the PAMS program and one for the NCore program. These dual requirements are listed in Table 1-9, but the details allowing for one NOy analyzer to be used for both programs are listed in the NO_2 chapter and this is true for the other parameters as well.

Table 1-9 Summary of Minimum Monitoring Requirements

Parameter	Requirements for Monitors/Samplers for CFR Programs	Number of Equipment Required	Number of Equipment Active	Number of Equipment Needed
O_3	CFR EPA Table D-2 only=	2	7	0
	NCore & PAMS only=	1	1	0
NO_2, True- NO_2, NO_y	Near-road=	2	1	1
	Area-Wide=	1	1	0
	Regional Administrator=	1	1	0
	PAMS true-NO_2=	1	0	1
	NCore & PAMS NO_y =	1	1	0
CO	Near-road=	1	1	0
	Regional Administrator	0	0	0
	NCore=	1	1	0
	SIP=	1	1	0
SO_2	PWEI=	1	1	0
	NCore=	1	1	0
Pb-TSP	Source (non-Airport)=	0	0	0
	Source (Airport)=	0	0	0
	Airport Study=	0	0	0
	Airport Study Exceedance=	1	1	0
	Regional Administrator=	0	0	0
	QA Collocation=	1	1	0
$PM_{2.5}$ Samplers	CFR EPA Table D-2 only=	3	5	0
	California Particulate Matter Network (non-microscale)=	5	4	1
	DV Maximum Concentration, 24-Hr =	1	1	0
	DV Maximum Concentration, Annual Average=	1	1	0
	Expected Maximum Concentration, 24-Hr =	1	1	0
	Expected Maximum Concentration, Annual Average=	1	1	0
	Near-road=	1	0	0
	Poor Air Quality=	1	1	0
	NCore=	1	1	0
	QA Collocation=	1	1	0
$PM_{2.5}$ Continuous	Minimum number required=	2	5	0
	Minimum number of $PM_{2.5}$ continuous collocated with $PM_{2.5}$ manual=	1	1	0
	NCore=	1	1	0
	QA collocation $PM_{2.5}$ continuous with $PM_{2.5}$ continuous=	0	0	0
$PM_{2.5}$ Speciation	$PM_{2.5}$ STN & CSN Speciation=	2	1	1
	NCore=	1	1	0
PM_{10} Samplers	CFR EPA Table D-2 only=	2-4	4	0
	NCore=	1	1	0
	QA collocation	1	1	0
NCore	$PM_{2.5}$-Continuous=	1	1	0
	$PM_{2.5}$-Manual (Integrated/filter-based)=	1	1	0
	$PM_{2.5}$-Speciated=	1	1	0
	$PM_{10-2.5}$=	1	1	0
	NCore & PAMS O_3=	1	1	0
	SO_2-TLE=	1	1	0
	CO-TLE=	1	1	0
	NCore & PAMS NO/NO_y=	1	1	0
	Wind speed/Wind direction=	1	1	0
	% Relative Humidity=	1	1	0
	Ambient temperature=	1	1	0
PAMS	Hourly averaged speciated volatile organic compounds (VOCs)=	1	1	0
	Three 8-hour averaged carbonyl samples per day on a 1 in 3 day schedule =	1	1	0
	NCore & PAMS O_3=	1	1	0
	NO=	1	1	0
	True-NO_2=	1	0	1
	NCore & PAMS NO_y	1	1	0
	NCore & PAMS Hourly averaged ambient temperature=	1	1	0
	NCore & PAMS Hourly vector-averaged wind direction=	1	1	0
	Hourly average atmospheric pressure=	1	1	0
	NCore & PAMS Hourly averaged relative humidity=	1	1	0
	Hourly precipitation=	1	1	0
	Hourly averaged mixing-height=	1	0	1
	Hourly averaged solar radiation=	1	1	0
	Hourly averaged ultraviolet radiation	1	1	0

Section 1.3 Summary of Minimum Monitoring Requirements (Data)

The EPA regulations specify, when applicable:

- how samplers, analyzers, and stations are positioned, to collect data that can be compared to the National standards (NAAQS),
- how the samplers and analyzers are checked using established EPA methodologies, and
- that this data can be legally certified.

Section 1.3.1 Suitability for Comparison to the NAAQS (Data)-Criteria Pollutants

The CFR requires that for O_3, NO_2, CO, SO_2, Pb-TSP, $PM_{2.5}$, PM_{10} data to be used in regulatory determinations of compliance with the NAAQS, these instruments must be sited according to Federal Regulations (these requirements are listed in 1)a)i)(1)(a)(i)Appendix A:) and the sampling frequency must be in accordance with Federal regulations (sampling frequencies for each pollutant are in their respective chapters). All the District's instruments meet or exceed all minimum monitoring requirements for siting and sampling frequencies, and the data from them can be compared to the NAAQS and the data can be certified.

Section 1.3.2 Quality Control/Quality Assurance (Data)-Criteria Pollutants

All the District's O_3, NO_2, CO, SO_2, Pb-TSP, $PM_{2.5}$ (manual), PM_{10} (manual) samplers and analyzers were calibrated, flow checked, one-point checked, internally/District-audited, and externally-NPAP & NPEP audited according to EPA methodologies and the data can be certified.

Section 1.3.3 Reporting/Certifying (Data)-Criteria Pollutants

All the ambient data from the O_3, NO_2, CO, SO_2, Pb-TSP, $PM_{2.5}$ (manual), PM_{10} (manual) samplers and analyzers were reviewed for validity and the verified data were uploaded into EPA's AQS database quarterly.

All QA and QC reports regarding the O_3, NO_2, CO, SO_2, Pb-TSP, $PM_{2.5}$ (manual), PM_{10} (manual) instruments were reviewed for validity and the verified data were uploaded into EPA's AQS database quarterly.

All reviewed and verified ambient data and all reviewed and verified QA/QC reports regarding the O_3, NO_2, CO, SO_2, Pb-TSP, $PM_{2.5}$ (manual), PM_{10} (manual) instruments, were certified in a letter to the EPA Region 9 Authorities by May 1.

Section 1.3.4 Unsuitability for Comparison to the NAAQS (Data)-non-Criteria Pollutants & Other

The District analyzes for other pollutants: $PM_{2.5}$ (continuous) in non-FEM mode, PAMS-VOCs, PAMS-Carbonyls, Toxics-VOCs, Toxics-Carbonyls, and Toxics-Metals. These instruments have no NAAQS to compare. All these instruments meet or exceed all minimum monitoring requirements for siting and sampling frequencies.

Section 1.3.5 Quality Control/Quality Assurance (Data)-non-Criteria Pollutants & Others

All QA/QC functions on the District's $PM_{2.5}$ (continuous) in non-FEM mode, PAMS-VOC, PAMS-Carbonyls, Toxics-VOC, Toxics-Carbonyls, and Toxics-Metals instruments met or exceeded EPA requirements.

Section 1.3.6 Reporting/Certifying (Data)-non-Criteria Pollutants & Others

All the data from the $PM_{2.5}$ (continuous), PAMS-VOC, PAMS-Carbonyls, Toxics-VOCs, Toxics-Carbonyls, and Toxics-Metals instruments were reviewed for validity and the verified data were uploaded into EPA's AQS. All QA/QC reports were reviewed for validity and the verified data were uploaded the EPA's AQS database. This data is non-certifiable and is not included in the annual Data Certification Report.

Section 1.4 Recent Planned and Unplanned Changes to the Network

The EPA Region 9 governing authority approves the District's distribution of monitors and the location of the collocated sites for compliance with Federal regulations. Any station or equipment changes will be undertaken in partnership and advisement with the EPA (and CARB, when applicable). Before any SLAMS monitor is decommissioned, the District will follow the procedures listed in 40 CFR Part 58.14, "System Modifications" and any proposed changes to the air monitoring network will be documented in the Annual Network Plan. The District will provide a minimum 30-day period for public review, prior to any change, when possible. If a station or analyzer is to relocate, parallel sampling will be undertaken, when possible.

Changes to the monitoring network may occur outside the annual monitoring network plan (ANP) approval and the planning process, due to unforeseen circumstances such as eviction, safety concerns, etc. Any changes due to circumstances beyond the District's control will be communicated in writing to the EPA Regional Authority and identified in the subsequent Annual Network Plan.
Note: all listed timelines for construction activities are an estimate, as all construction activities are handled by the County Department of General Services and the District has no control over their timelines.

Section 1.4.1 Station Changes (Relocations, Shutdowns, and Additions)

The section discusses all the station changes in the network (planned and unplanned).

Section 1.4.1.1 Relocations

- **Escondido -** Operational timeline early-2021
  The District is awaiting final permitting approval from the City of Escondido before we can proceed with construction.
- **San Ysidro (SAY) $PM_{2.5}$ -** Operational timeline, possibly early-2021
  Construction in late 2020. Once completed, it will serve multiple capacities/programs:
  - EPA Border 2020 program ($PM_{2.5}$ continuous and Black Carbon continuous analyzers).
  - EPA NO_2 Near-road program for the location of the 2nd required site (NO_2 analyzer)
  - State AB 617 program (exact parameters unknown)
- **Camp Pendleton -** Operational timeline unknown
  This station needs to be relocated (EPA R9 2017 TSA recommendation). Data is often affected by emissions from the upwind motor pool. A weak node in the power grid, causes frequent power outages which have cascading ramifications: loss of data; equipment repairs; additional field QA/QC; etc. The District has significant site/base access complications. Once a new location is identified, the District will submit a 58.14 request to EPA to the EPA R9 Authorities for approval.
- **NCore & PAMS site -** Operational timeline unknown
  The NCore location at Lexington Elementary School is at maximum instrument capacity. The PAMS ceilometer cannot be situated on the property and there is no ability to expand (EPA R9 verified these issues in the 2017 TSA). The District believes the new Escondido station can serve as an NCore replacement site and will work with EPA Authorities to formalize this request.
  Note: In 2017, the District requested permission of the EPA to locate the ceilometer at Escondido.

Section 1.4.1.2 Station Shutdowns (Temporary or Permanent):

- **Chula Vista Temporary Shutdown –** Operational timeline unknown (possibly early 2022)
  Temporary Shutdown timeline late-2020/early-2021

The entire site will be demolished. Once reconstructed, the rooftop sampling equipment will be permanently relocated to ground level (Approved during the EPA R9 2017 TSA). The EPA R9 Authorities have given the District permission to temporarily shut down all sampling.

Section 1.4.1.3 Station Additions

- **Near the Otay Mesa Point-of-Entry (POE) -** Operational timeline early-2021
  The EPA Border 2020 Authorities have requested that $PM_{2.5}$-continuous and Black Carbon-continuous analyzers be located near the Otay Mesa POE. The District has received landlord approval to deploy a sampling platform at the State of California Highway Patrol Truck Safety Inspection facility along east Via de la Amistad. As with the San Ysidro site, this location will serve multiple purposes:
  - EPA Border 2020 program ($PM_{2.5}$ continuous and Black Carbon continuous analyzers).
  - Ambient pollutants (exact parameters unknown)
  - State AB 617 program (exact parameters unknown)

Section 1.4.2 Monitor/Sampler/Equipment Replacements, Shutdowns, and Additions

The section discusses the monitor/sampler changes in the network with respect to the pollutant or program.

Section 1.4.2.1 Replacements

- **PM_{10}-sequential –** Completed Jan 2020
  All PM_{10} Hi-Vol samplers were replaced with Met One E-seq Lo-vol samplers without the Very Sharp Cut Cyclone (VSCC).
- **$PM_{2.5}$-sequential –** Completed in Jan 2019
  All $PM_{2.5}$-sequential samplers were replaced with Met One E-seq Lo-vol samplers with the VSCC.
- **Toxics-Metals TSP-Hi-Vol to PM_{10} Lo-Vol -** Operational timeline early-2021
  The TSP samplers used for the Toxics-Metals program are no longer made, so they will be replaced with Met One E-seq Lo-vol samplers without the VSCC. This will also align the collection method with the EPA NATTS program, thus making the data directly comparable, as well as lowering operational costs by utilizing the same basic Met One PM sampling platform for several programs.
- **$PM_{2.5}$-continuous -** Operational timeline late-2021.
  All $PM_{2.5}$ continuous analyzers will be replaced with new ones.
- **$NO/NO_2/NO_x$ (NO_x) to true-NO_2 -** Operational timeline early-2021.
  The District will work with EPA R9 Authorities to obtain permission to replace all the traditional NO_x analyzers with true-NO_2 analyzers.
  Note: some NO_x instruments will be collocated to track the age of the NO pollution mass.

Section 1.4.2.2 Shutdowns

- **Pb-TSP at McClellan Palomar Airport (CRQ) -** Shutdown timeline is unknown (EPA dependent)
  All the measured concentrations at the Palomar Airport location are well below 50% of the NAAQS. In 2017 the District petitioned the EPA to decommission lead sampling at this airport and it is still pending EPA approval. Until this request is ruled upon, the District will continue to administer the regulatory lead program.
  Note: If approved, the District will sample for lead, as well as other metals, using a PM_{10} Lo-Vol sampler as part of the Toxics-Metals program.

Section 1.4.2.3 Additions

- **Ozone Field Transfer Standards -** Operational timeline early-2021
  The District will add a second ozone analyzer to every station that measures for ozone. It will serve as an ozone transfer standard, so the ozone nightly automated QC checks can be official/Level 3 at all ozone sampling locations.
- **Audits -Gaseous -** Operational timeline late-2021
  The District received EPA approval to undertake a trial for automated audits. A separate calibrator, zero air generator, and audit gas will be deployed at the Kearny Villa Road station. QA functions remotely operated at District headquarters will be run (time frequency to be determined). If this proves successful, this will be expanded to include the NCore site and the farther flung stations in the SDAB (Camp Pendleton, Donovan, and Alpine).
- **PAMS Re-engineering –** EPA implementation date expected June 2021.
  Based on 40 CFR part 58, Appendix D, State air monitoring agencies are required to begin taking PAMS measurements at their NCore location(s) by June 1, 2019. The equipment needed to measure PAMS parameters were to be purchased by USEPA using a nationally negotiated contract and delivered to the monitoring agencies. USEPA has announced that due to contract delays, the necessary equipment will not be delivered in time to begin making PAMS measurements by June 1, 2019. USEPA has indicated that it is working on a proposed rule to extend the start date of PAMS measurements. As a result of the delay, the San Diego Air Pollution Control District will not begin taking the PAMS measurements and will work with EPA to begin measurements on or before the final revised start date for this network.
- **PAMS Ceilometer -** Operational timeline unknown (EPA dependent)
  The District requested a waiver to locate the ceilometer at a site other than the NCore location (at the new Escondido site). The request is still pending (see the 2017 ANP for the request).
- **PAMS VOCs (not at the NCore location) -** Operational timeline unknown (possibly June 2022)
  PAMS-VOCs measurements (via canister sampling) at current Toxics-VOCs sites will be undertaken, but for the C2-C6 compounds only. This is dependent on funding for laboratory equipment upgrades.

Section 1.4.2.4 Other

- **Calibration & Audit Schedule -** Operational timeline 2021
  The District is adding three more stations (Escondido, San Ysidro, Otay Mesa) in 2021 and to balance the calibration and audit schedule, a complete reshuffling of the QA/QC dates will be undertaken.
- **Electronic Field Logbooks -** Operational timeline early-2021.
  The District is in the process of converting to a cloud-based electronic logbook for field work.
- **Electronic Laboratory Information Management System -** Operational timeline early-2021.
  The District is in the process of converting to a centralized storage and retrieval system for all laboratory work (not including $PM_{2.5}$ at this time).

Section 1.5 List of Public Comments to this Report and the District Response(s)

The section addresses the comments from the public regarding inquiries to this report.

1. Posted for Public Review by May 27, 2020.
2. There were no comments

Chapter 2: Ozone (O_3)

Section 2.1 Ozone Introduction

Ambient level Ozone was sampled on a continuous (7/24) basis at locations throughout the SDAB (Figure 2.1) and referenced to the ozone standard of the year (Table 2-1). The sampling equipment are listed in Table 2-2. Please note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and relocated the station 20 meters southeast of the original location to be on San Diego County property and is currently under construction.

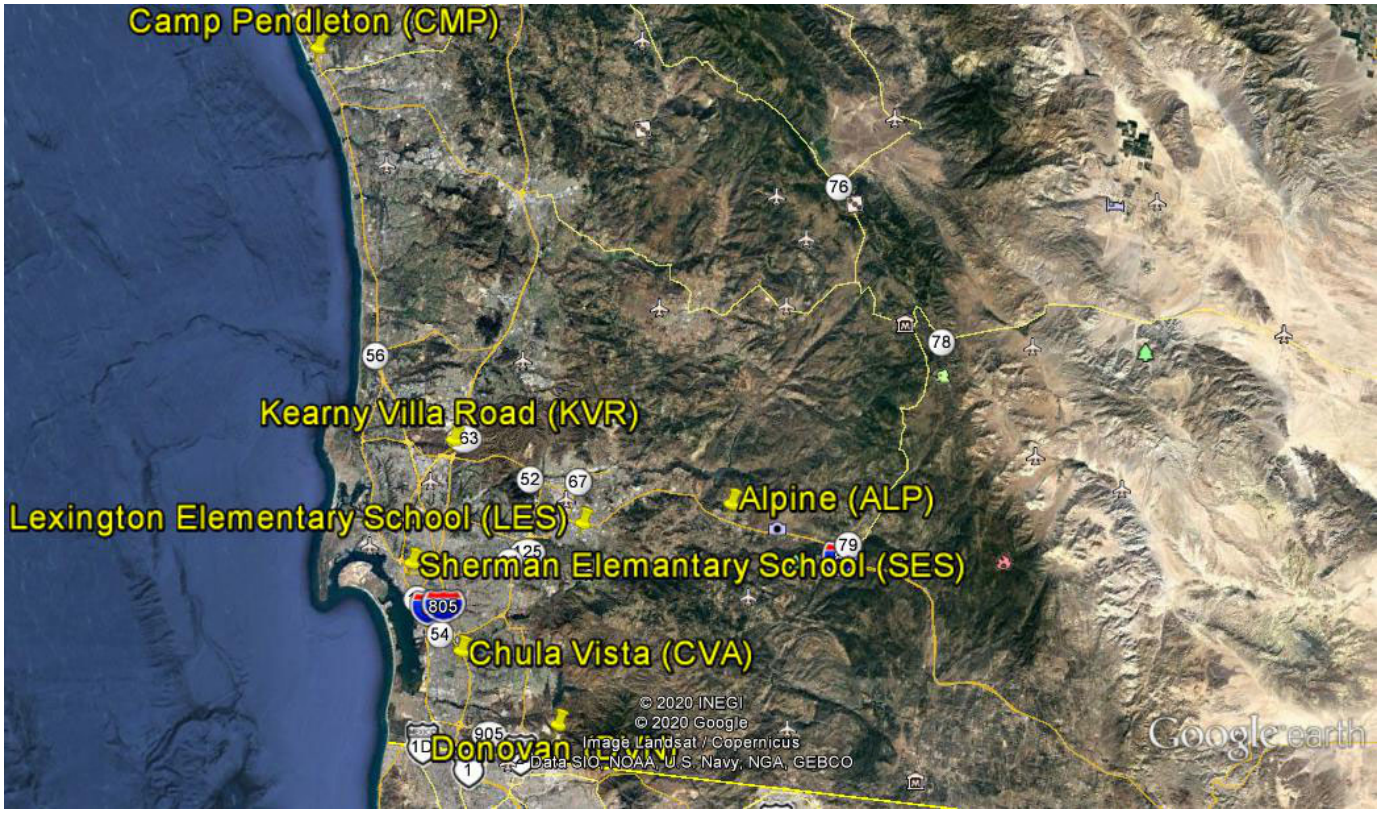


Figure 2.1 Ozone Network Map

Table 2-1 Ozone State and Federal Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	Not Applicable	Not Applicable
	8 hour	0.07 ppm (137 µg/m^3)	0.07 ppm (137 µg/m^3)	0.07 ppm (137 µg/m^3)

Table 2-2 Ozone Monitoring Network

Abbreviation		ALP	CMP	CVA	LES	KVR	DVN	SES
Name		Alpine	Camp Pendleton	Chula Vista	Lexington	Kearny Villa Rd	Donovan	Sherman
AQS ID		06-073-1006	06-073-1008	06-073-0001	06-073-1022	06-073-1016	06-073-1014	06-073-1026
O_3	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Method	UV	UV	UV	UV	UV	UV	UV
	Affiliation	Not Applicable	PAMS	Not Applicable	PAMS, NCore	Not Applicable	Not Applicable	Not Applicable
	Spatial Scale	US	NS	NS	NS	NS	NS	NS
	Site Type	HC	PE	PE	PE	PE	PE	PE
	Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS
	Equipment	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 2.2 Ozone Minimum Monitoring Requirements

The District is federally mandated to monitor O_3 levels in accordance with the CFR. This section will state the different monitoring requirements for each program, e.g. ambient, PAMS, NCore, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other O_3 network requirements, e.g. ambient O_3 monitor can fulfill a PAMS O_3 monitor requirement.

The District meets or exceeds all minimum requirements for O_3 monitoring for all programs.

Section 2.2.1 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr)

The District is required to operate a minimum number of O_3 monitors irrespective of O_3 network affiliations. To ascertain the minimum number of monitors required, the Design Value (DV) must be calculated. The DV is derived by averaging the last three years. Table 2-3 lists these DV requirements.

> *4.1(a) Ozone (O_3) Design Criteria*[1]
> *…local agencies must operate O_3 sites for various locations depending upon area size (in terms of population and geographic characteristics) and typical peak concentrations (expressed in percentages below, or near the O_3 NAAQS). Specific SLAMS O_3 site minimum requirements are included in Table D-2 of this appendix. The NCore sites are expected to complement the O_3 data collection that takes place at single-pollutant SLAMS sites, and both types of sites can be used to meet the network minimum requirements. The total number of O_3 sites needed to support the basic monitoring objectives of public data reporting, air quality mapping, compliance, and understanding O_3-related atmospheric processes will include more sites than these minimum numbers required in Table D-2 of this appendix….*

Table D–2 of Appendix D to Part 58— SLAMS Minimum O_3 Monitoring Requirements

MSA population	*Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS*	*Most recent 3-year design value concentrations <85% of any O_3 NAAQS*
350,000 - < 4 million	*2*	*1*

Table 2-3 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr)

What is the Maximum 8-Hr Design Value? **2017-2019** (ppm)	Is the Maximum 8-Hr Design Value ≥ 85% of the NAAQS? **2017-2019** (yes/no)	Is the Maximum 8-Hr Design Value < 85% of the NAAQS? **2017-2019** (yes/no)	Does the Maximum 8-Hr Design Value Meet the NAAQS? **2017-2019** (yes/no)	MSA & County (name)	Population Estimated from 2010 Census[2] (#)	Number of Monitors Required (#)	Number of Monitors Active (#)	Number of Monitors Needed (#)
0.082	YES	No	no	San Diego	3.3 Million	2	7	0

[1](2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.1 "Ozone (O_3) Design Criteria", subsection 4.1(a), list the requirements needed to fulfill the Ozone (O_3) Design Criteria.
[2] Based on the most recent official U.S Census statistics.

Section 2.2.2 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value

All Districts are required to categorize at least one monitor/sampling site in the air basin as an area of maximum concentration. A concentration is calculated for this site. The DV is derived by averaging the 4th highest for the last three years. Table 2-4 lists these maximum concentrations site requirements.

> *4.1(b) Ozone (O_3) Design Criteria*[3]
> *Within an O_3 network, at least one O_3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area…*

Table 2-4 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value

Maximum 8-Hr Design Value Site **2017-2019** (name)	Maximum 8-Hr Design Value Concentration **2017-2019** (ppm)
Alpine (ALP) 06-073-1006	0.082

Section 2.2.3 Ozone Minimum Monitoring Requirements-Ozone Season

All Districts are required to sample for ozone during ozone season as defined by Table D-3. Table 2-5 lists the ozone sampling season for the SDAB.

> *4.1(i) Ozone (O_3) Design Criteria*[4]
> *Ozone monitoring is required at SLAMS monitoring sites only during the seasons of the year that are conducive to O_3 formation (i.e., "ozone season") as described below in Table D-3… Ozone monitors at NCore stations are required to be operated year-round (January to December).*

Table D-3 to Appendix D of part 58. Ozone Monitoring Season by State

State	*Begin Month*	*End Month*
California	*January*	*December*

Table 2-5 Ozone Minimum Monitoring Requirements-Ozone Sampling Season

Required Ozone Sampling Season (range)	Active Ozone Sampling Season (range)	Does Active Ozone Sampling Season Meet Requirements? (yes/no)
January-December (annually)	January-December (annually)	yes

[3](2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.1 "Ozone (O_3) Design Criteria", subsection 4.1(b), list the requirements needed to fulfill the Ozone (O_3) Design Criteria.
[4] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.1 "Ozone (O_3) Design Criteria", subsection 4.1(i), list the requirements needed to fulfill the Ozone (O_3) Design Criteria.

Section 2.2.4 Ozone Minimum Monitoring Requirements-NCore & PAMS

The District is required to operate NCore and Photochemical Assessment Monitoring Stations (PAMS) sites. There are several associated requirements to operate these sites. One of the overlapping requirements is to operate O_3 monitors. Table 2-6 lists Ozone (O_3) Monitoring requirements.

NCore

3.1 Design Criteria for NCore Sites[5]
(b) The NCore sites must measure, at a minimum, PM2.5 particle mass using continuous and integrated/filter-based samplers, speciated PM2.5, PM10-2.5 particle mass, O3, SO2, CO, NO/NOY, wind speed, wind direction, relative humidity, and ambient temperature.

PAMS

5 Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring[6]
(a) … PAMS measurements include:…(3) Hourly averaged O3;

Table 2-6 Ozone Minimum Monitoring Requirements-PAMS

Number of O_3 Monitors Required at NCore & PAMS Sites (#)	Number of O_3 Monitors Active at NCore & PAMS Sites (#)	Number of O_3 Monitors Needed at PAMS & NCore Sites (#)	Location of O_3 Monitors at NCore & PAMS Sites (name)
1	1	0	Lexington (LES) 06-073-1022

Section 2.2.5 Ozone Minimum Monitoring Requirements-Summary

Table 2-7 summarizes all the O_3 minimum monitoring requirements from Sections 2.2.1-2.2.4.

Table 2-7 Ozone Minimum Monitoring Requirements-Summary

Requirements for O_3 Monitors for CFR Programs (name)	Number of O_3 Monitors Required (#)	Number of O_3 Monitors Active (#)	Number of O_3 Monitors Needed (#)
CFR EPA Table D-2 only=	2	7	0
NCore & PAMS only=	1	1	0

[5] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3(b), "Network Design for NCore Sites.

[6] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 5(a)-(b)(3), "Network Design for Photochemical Assessment Monitoring Stations (PAMS)", -subpart (3) "Ozone Monitoring Requirements"

Section 2.3 Ozone Suitability for Comparison to the NAAQS

The CFR requires that for O_3 data to be used in regulatory determinations of compliance with the O_3 NAAQS, the O_3 monitors must be sited according to Federal Regulations[7] and the sampling frequency must be in accordance with Federal Regulations.[8] All District O_3 monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 2-8 summarizes these requirements.

Table 2-8 Ozone Suitability for Comparison to the NAAQS- Sampling Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Sampling Frequency	Method ID
Ozone O_3	44201	ppm	007	1-Hr	1	Thermo 49 series	Ultraviolet absorption	047	7/24	EQOA-0880-047

Section 2.4 Ozone Concentrations for San Diego

Over the last few years, the ozone concentration has been fluctuating. This section will illustrate the different metrics for comparison.

Section 2.4.1 Ozone Concentrations for San Diego-for the Last 20 Years

San Diego has realized a significant decrease in the 3-yr average of the exceedance days for ozone and has seen a sharp decrease in its 8-hour Design Value since 1990 (Table 2-9 and Figure 2.2).
Note: "Days Above the National 8-Hr Standard" in Table 2-9 reflect the ozone standard for that year.

Table 2-9 Ozone Concentrations for San Diego-for the Last 20 Years, 1999-2019

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average of the 4th Highest 8-Hr Design Value (ppm)	0.099	0.100	0.094	0.095	0.093	0.089	0.086	0.088	0.089	0.092	0.089	0.088	0.083	0.081	0.080	0.079	0.079	0.081	0.084	0.084	0.076
Maximum 8-Hr Concentration (ppm)	0.112	0.106	0.116	0.100	0.103	0.095	0.089	0.100	0.092	0.109	0.097	0.088	0.093	0.083	0.083	0.081	0.084	0.091	0.095	0.082	0.084
Days above the National 8-Hr Standard	44	46	43	31	38	23	24	38	27	35	24	14	10	10	7	12	13	13	54	23	19

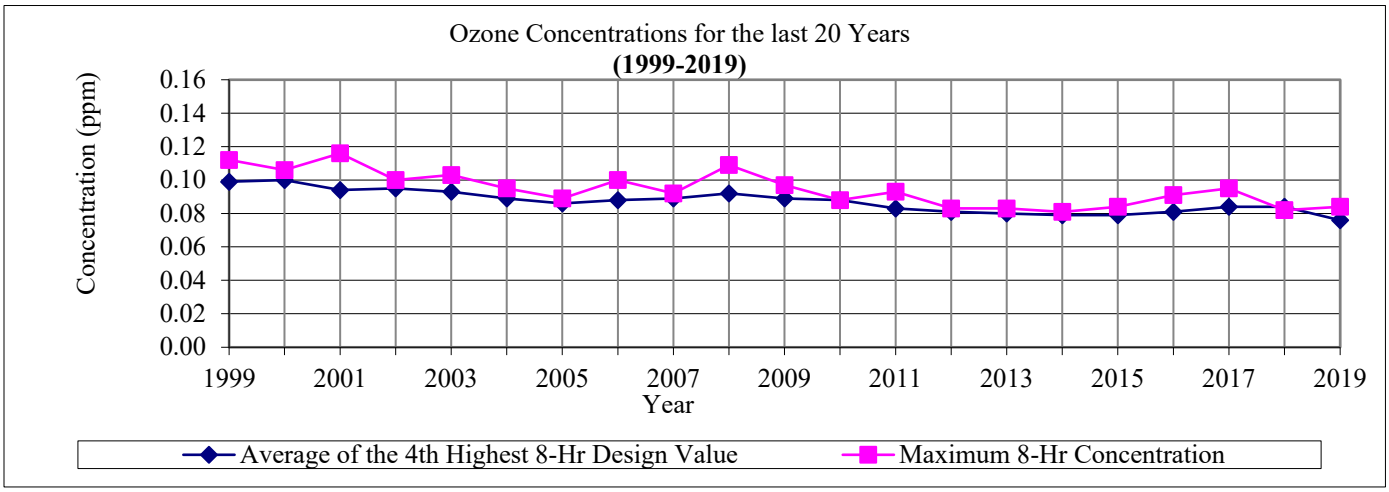


Figure 2.2 Ozone Concentrations for San Diego-for the Last 20 Years Graph

[7] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.
[8] (2018) (2018) 40 CFR Part 58, Subpart B, (a), "Operating Schedules".

Section 2.4.2 Ozone Concentrations for San Diego-by Site for the Year

Table 2-10 lists the maximum ozone measurements for every ozone monitoring location and Figure 2.3 show the values graphically with respect to the National Standard for the year.

FOR INFORMATIONAL PURPOSES ONLY
NAAQS comparison requires DV calculations. Annual values are not comparable to the NAAQS

Table 2-10 Ozone Concentrations for San Diego-by Site for the Year, 2019

No. (#)	Site (name)	Site Abbreviation (name)	Maximum Concentration for 8-Hrs (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
1	Camp Pendleton	CMP	0.064	0	0.039
2	Kearny Villa Road	KVR	0.075	1	0.042
3	Alpine	ALP	0.084	16	0.052
4	Lexington	LES	0.074	2	0.045
5	Sherman	SES	0.072	1	0.039
6	Chula Vista	CVA	0.076	2	0.041
7	Donovan	DVN	0.062	0	0.041

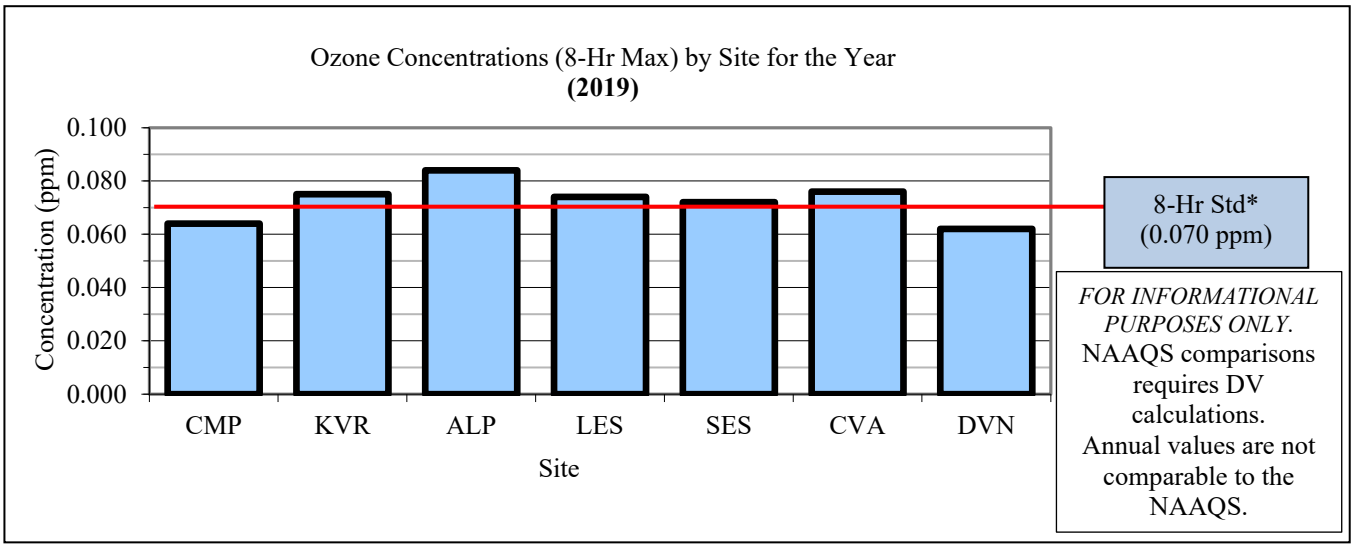


Figure 2.3 Ozone Concentrations for San Diego-by Site for the Year Graph

Section 2.4.3 Ozone Concentrations for San Diego-by Site for Design Value

Table 2-11lists the maximum ozone measurements for every ozone monitoring location and Figure 2.4 shows the values graphically for the Design Value.

Table 2-11 Ozone Concentrations for San Diego-by Site for Design Value, 2017-2019

No. (#)	Site (name)	Site Abbreviation (name)	Concentration of 8-Hr Design Value (ppm)	Is the 8-Hr Design Value ≥ 85% of the NAAQS? (yes/no)	Does the 8-Hr Design Value Meet the NAAQS? (yes/no)
1	Camp Pendleton	CMP	0.063	yes	yes
2	Kearny Villa Road	KVR	0.071	yes	NO
3	Alpine	ALP	0.082	yes	NO
4	Lexington	LES	0.070	yes	yes
5	Sherman	SES	N/A	N/A	N/A
6	Chula Vista	CVA	0.062	yes	yes
7	Donovan	DVN	0.064	yes	yes

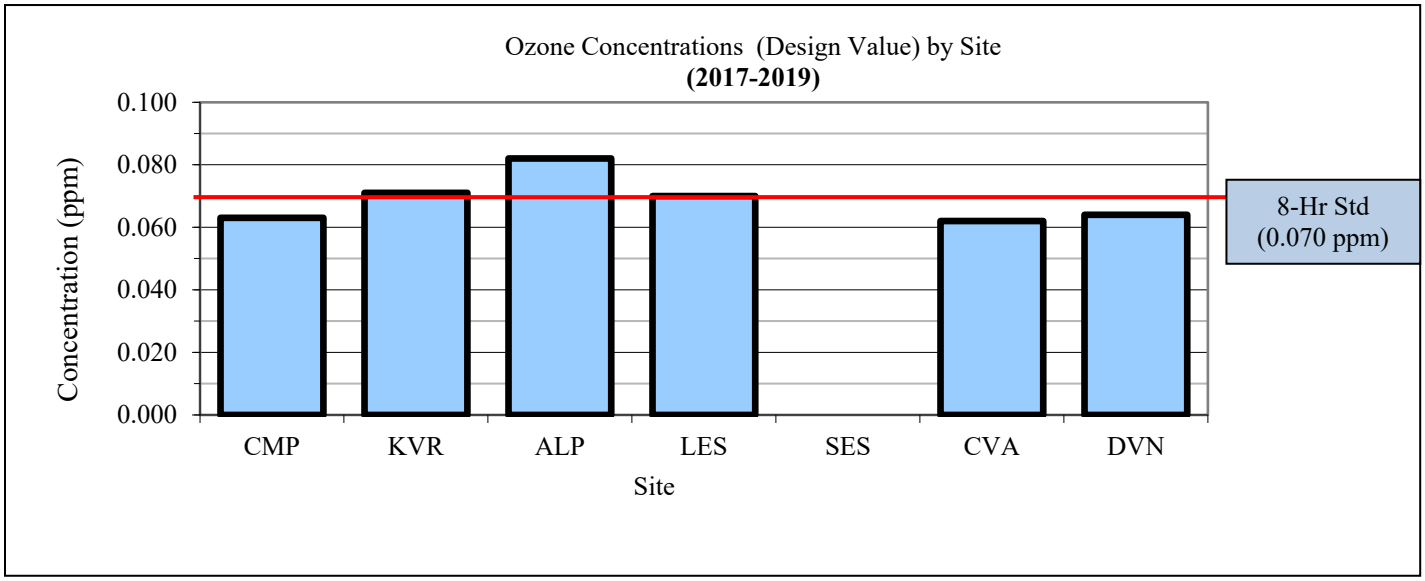


Figure 2.4 Ozone Concentrations for San Diego-by Site for Design Value Graph

Chapter 3: Nitrogen Dioxide (NO_2) and Reactive Oxides of Nitrogen (NO_y)

Section 3.1 Nitrogen Dioxide and Reactive Oxides of Nitrogen Introduction

Ambient level nitrogen dioxide was sampled on a continuous basis at locations throughout the SDAB (Figure 3.1) and referenced to the nitrogen dioxide standards of the year (Table 3-1). The sampling equipment are listed in Table 3-2. Please note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and relocated the station 20 meters southeast of the original location to be on San Diego County property and is currently under construction.

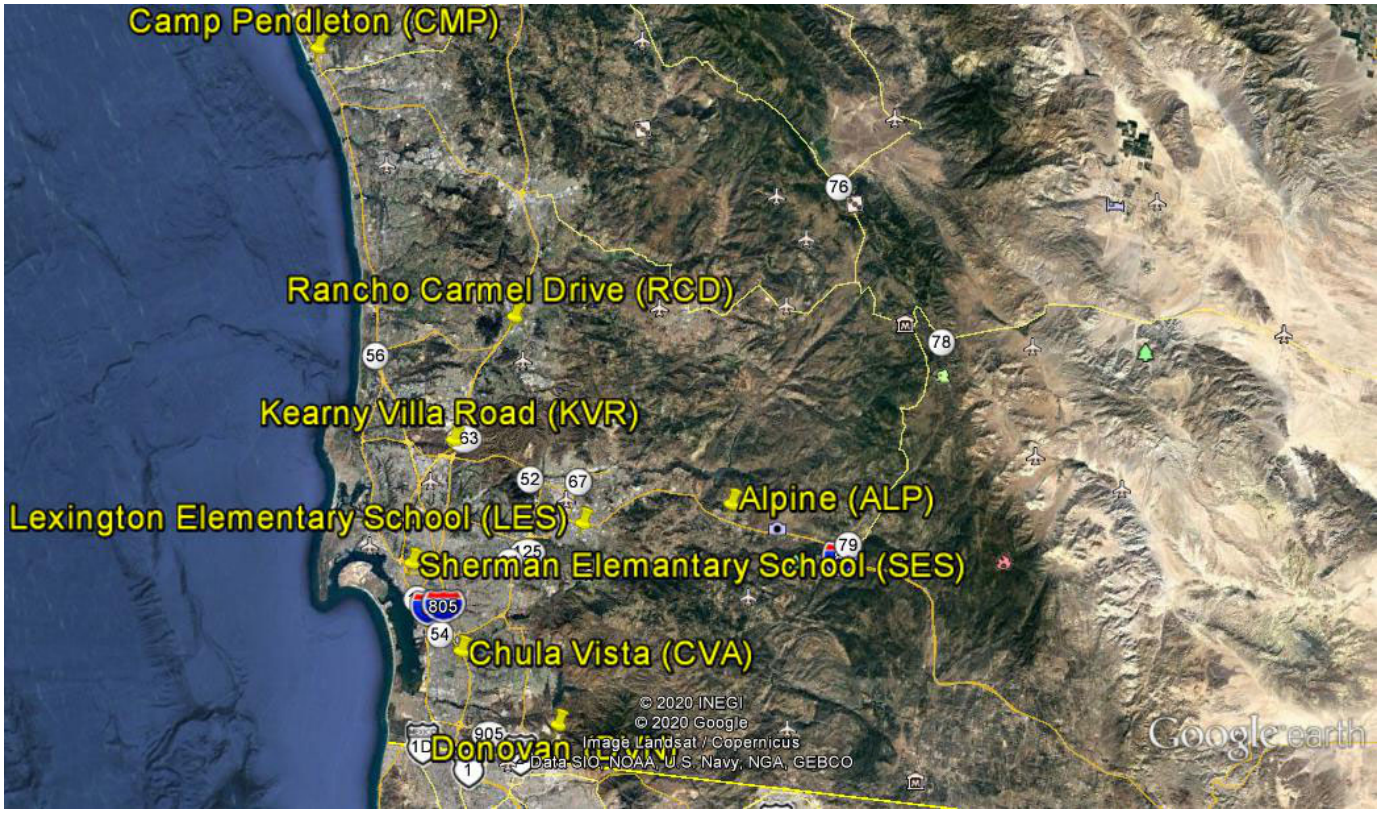


Figure 3.1 Nitrogen Dioxide & NO_y Network Map

Table 3-1 Nitrogen Dioxide State and National Standards for the Year*

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	Not Applicable
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (137 µg/m^3)	0.053 ppm (137 µg/m^3)

*The NO_y analyzer is non-regulatory; therefore there are no NAAQS to compare. The NO_x and NO_y measurements are comparable in the SDAB.

Table 3-2 Nitrogen Dioxide & Reactive Oxides of Nitrogen Monitoring Network

	Abbreviation	ALP	CMP	CVA	LES		KVR	DVN	RCD	SES
	Name	Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School		Kearny Villa Rd	Donovan	Rancho Carmel Dr.	Sherman Elementary
	AQS ID	06-073-1006	06-073-1008	06-073-0001	06-073-1022		06-073-1016	06-073-1014	06-073-1017	06-073-1026
NO_2 & NOy	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Designation	PRI	PRI	PRI	PRI	Not Applicable	PRI	PRI	PRI	PRI
	Method	CL	CL	CL	CL	CL	CL	CL	CL	CL
	Affiliation	Not Applicable	Not Applicable	Not Applicable	PAMS	NCore, PAMS	Not Applicable	SLAMS	NR	NR
	Spatial Scale	US	NS	NS	NS	NS	NS	NS	MI	NS
	Site Type	PE	PE	PE	PE	PE	PE	HC	SO	PE
	Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, Research	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS
	Equipment	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i-y	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 3.2 Nitrogen Dioxide Minimum Monitoring Requirements

The District is federally mandated to monitor NO_2 levels in accordance with the CFR. This section will state the different minimum monitoring requirements for each program, e.g. ambient, Near-road, PAMS, etc., that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other NO_2 network requirements, e.g. ambient NO_2 monitor can fulfill a PAMS NO_2 monitor requirement.

The District meets or exceeds all minimum requirements for NO_2 monitoring for all programs except for the following:

- Establishment of the 2nd Near-road location (in process now)
- Establishment of true-NO_2 monitor at the PAMS site (EPA approved).

Section 3.2.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road

To measure concentrations for some pollutants in communities located by roadways, the EPA instituted the Near-road monitoring program. Table 3-3 lists the Near-road monitors required for the SDAB.

> *4.3.2(a) Requirement for Near-road NO_2 Monitors* [9]
> *Within the NO_2 network, there must be one microscale near-road NO_2 monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO_2 monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or in any CBSA with a population of 1,000,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.*

Table 3-3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road

MSA & County (name)	Population Estimated from 2010 Census[10] (#)	Number of NO_2 Near-road Monitors Required (#)	Are Additional NO_2 Near-road Monitors Required? (yes/no)	Number of Additional NO_2 Near-road Monitors Required (#)	Number of NO_2 Near-road Monitors Required (total) (#)	Number of NO_2 Near-road Monitors Active (#)	Number of NO_2 Near-road Monitors Needed (#)
San Diego	3.3 Million	1	YES	1	2	1	1

Section 3.2.1.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (first site)

The first Near-road site must be sited in the area of the highest traffic count, adjusted for High Density (FE=Fleet Equivalency) vehicles. The first NO_2 near-road location is off of Rancho Carmel Drive (RCD).

Section 3.2.1.2 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site)

The criteria for the second Near-road location are more flexible than the criteria for the first site. The second site is not necessarily the next location according to FE ranking. The EPA prescribes that the second site be selected so that it is differentiated from the first by one or more factors affecting traffic emissions and/or pollution transport, i.e. fleet mix, terrain, geographic area, different roadway, public

[9] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.3 "Nitrogen Dioxide (NO_2) Design Criteria", subpart 4.3.2 "Requirement for Near-road monitors"
[10] Based on the most recent official U.S Census statistics.

health, etc. The District has successfully located an area near the San Ysidro Point-of-Entry (POE) at Fire Station #29 (at Interstate-5 and Cottonwood Road), which is also in an EJ area. This site has been:

- fully endorsed by Casa Familiar, a local environmental group.
- verbally approved by EPA-National authorities.
- visited and verbally approved by EPA-Region 9 Authorities during the 2017 TSA.

Consequently, the District entered into a MOU with the City of San Diego Fire Department in 2019 and began the construction process in 2020 (with a predicted operational timeline of early-2021). All Near-road candidate locations must be formally approved by EPA. This process requires filling out an EPA Near-road template. Table 3-4 is the formal application for the San Ysidro Near-road location.

Table 3-4 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site) Matrix

No.	Condition	Notes
1	Plan submitted by July 1, 2017	None
2	Submitted for public comment	Yes in the 2017, 2018, & 2019 Network Plans
3	Anticipated start-up	Early-2021
3	AQS #	06-073-1025
5	Address and coordinates	32.552833°, -117.047360° 198 W San Ysidro Blvd, San Diego, CA 92173 at Fire Station #29
6	Sampling & analysis method	NO_x (Chemiluminescence)- Method 074 $PM_{2.5}$ (continuous)- Method code 733 BC-1060 (continuous)- Method code 879 Toxics-VOCs- Method code 210
7	Sampling & analysis duration	NO_x (Chemiluminescence)- year-long & 24/7 $PM_{2.5}$ (continuous)- year-long & 24/7 BC-1060 (continuous)- year-long & 24/7 Toxics-VOCs- year-long & 1:6
8	Any plans to remove or move the monitor within 18 months?	No
9	Monitoring objective & spatial scale	Public Information, NAAQS, Microscale for NO_x Public Information, Microscale for all else
10	CBSA	San Diego-Carlsbad-San Marcos
11	CBSA population & year	3.3 million (estimated from 2010 census)
12	Maximum AADT counts & year (2018)	**FE AADT (estimated)=** 90,002 **AADT=** 65,000 **HDc (estimated)=** 2,778 **Ranking (County)=** 231 (of 500 County-wide ranked segments) If you take out the road segments that cannot be used, because of their proximity to the 1st near road site and take out the road segments that cannot be used due to planned and current highway expansion (Interstate 5 between State Routes 56 and 78), the **Ranking (County, adjusted)=** 203 *FE AADT= (AADT - HDc) + (HDm x HDc)* *HDc= High density count (trucks)* *HDm= High density multiplier (10)*
13	Correct number of required NOx (NO_2) monitors?	Two NO_x (NO_2) monitors based on population
14	Are all road segments ranked?	Yes, by FE & AADT

15	How is fleet mix considered?	A high volume of passenger vehicles with a number of buses and diesel delivery style vehicles queue at the border crossing.
16	How is roadway design considered?	Station will be about 2 meters lower than the target road segment
17	How is congestion considered (congestion rating)?	A/B at the road segment, but about 1.5 km south (downwind) at the San Ysidro POE, "F".
18	How is terrain considered?	Some hills about 0.5 km downwind of the site. Otherwise, flat terrain for several kilometers upwind of the location
19	How is meteorology considered?	The typical wind direction varies by the time of day with nighttime/early morning hours, the winds are generally light out of the northeast, due to drainage and land breezes. These northeast winds are a stronger in the fall and winter, than other months. By late morning/afternoon, the winds are usually from the west or southwest. Occasionally, the winds will blow from the northwest. This is the onshore sea breeze flow that develops in the coastal environment almost every day. The only time this wind pattern is interrupted is if there is a storm system or a Santa Ana occurs. When onshore winds are blowing, emissions from the I-5 will be measured here.
20	How is population exposure considered?	Residential community (see "Other" sections at the end of the table)
21	1st Near-road site?	Interstate-15 (I-15) at Rancho Carmel Dr. is on a hill overlooking I-15. This site is in the north mid-county along the busiest road segments in the air basin. Much of the multi-axle vehicles use this route to Los Angeles/Riverside/Inland Empire. 2nd Near-road site in San Ysidro will be even with I-5, will be at the southernmost point of the air basin, and will have a higher mix of cars compared to trucks with much longer idle times.
22	Distance from the target road?	30 meters to road
23	Will the vertical inlet be within 2-7 meters?	Yes
24	Will the probe distance from supporting structures be a least 1 meter away vertically or horizontally?	Yes
25	Will the air flow between the probe and the outside nearest edge of the target road segment be unobstructed?	Yes

The San Ysidro POE is the busiest in the U.S. Vehicles emit air pollution when moving and at idle. Residents and a local environmental group, Casa Familiar, in the San Ysidro area have expressed concerns over the air quality impacts of the POE in their community along the freeways leading to and from the POE. Upon investigation using CalEnviroScreen, EJ Screen, NATA database, Customs data, and local health statistics, the San Ysidro area is greatly impacted by the POE. Air quality measurements are needed in this area to determine if steps are needed to improve the air quality in these communities.

The San Ysidro POE averages about 2 million vehicles and 600,000 pedestrian crossings a month or approximately 70,000 vehicle and 20,000 pedestrian crossings a day. These are only the northbound (from Mexico to the United States) statistics, but a large percentage of the morning northbound crossings return southbound (from the United States to Mexico) in the evening. During peak commuting times, the POE has a long vehicle queue flowing from south to north in the morning and reversed in the evening. Wait times and queue length are day of the week and holiday dependent. Normally, the Mon-Fri traffic

experiences wait time of about 60 minutes, weekend traffic wait/engine idle times of 90-120 minutes are common, and holidays longer yet. Air pollution control devices on engines at idle operate inefficiently, thus increasing microscale air pollution impacts in the areas adjacent to the POE.

Road segments near the San Ysidro POE have a lower traffic count when compared to elsewhere in the County. The District believes the actual traffic count to be higher, because of the long queues of cars (up to 3+ kilometers long, depending on metrics above) in the POE lanes. These queues of idling vehicles would increase the effective traffic count, but there is no mechanism to account for this phenomenon.

The San Ysidro community is part of the South Region, as defined by the County of San Diego Health and Human Services Agency (HHSA). According to the most recent San Diego County HHSA health data portal (2011-2017), the South Region routinely is in the higher percentiles for coronary heart disease, stroke, asthma, and COPD for indicators for poor health, as compared to the other regions in the county. Numerous publications and studies have linked these health issues to air pollution, specifically, particulate matter, ozone, nitrogen dioxide, and diesel exhaust. Table 3-5 lists these health indicators and compares the rates to the other regions in the county. For 2011-2017 the South Region was:

Table 3-5 Common Air Pollution Related Health Issues in the South Region of San Diego

Parameter	Rating
Coronary Heart Disease Related Deaths	2nd
Coronary Heart Disease Related Hospitalizations	Alternates between 1st and 2nd
Coronary Heart Disease Related Emergency Room Visits	Alternates between 3rd and 4th
Stroke Related Deaths	5th
Stroke Related Hospitalizations	2nd
Stroke Related Emergency Room Visits	3rd
Asthma Related Deaths	Insufficient data
Asthma Related Hospitalizations	3rd
Asthma Related Emergency Room Visits	2nd
COPD Related Deaths	5th
COPD Related Hospitalizations	Alternates between 2nd and 3rd
COPD Related Emergency Room Visits	Alternates between 1st and 2nd

The EPA has several on-line science-based tools, CalEnviroScreen, EJScreen, National Ambient Air Toxics Assessment (NATA) database, etc., that identify pollution from multiple sources, the effects, and those communities most at risk. The community of San Ysidro has several of these elevated markers that indicate a higher vulnerability to air pollution. Compared to other areas, this location ranks in the higher percentile bracket for $PM_{2.5}$, Pesticide, and Toxic release emissions, as well as higher percentile for cardiovascular disease, linguistic isolation, poverty, and less than a high school education.

EPA, CARB, academia, and others have sponsored or participated in various special sampling projects along both sides of the San Ysidro-Otay Mesa border area. Findings have indicated that $PM_{2.5}$ and toxic compounds are elevated and trend high with an increase in the border traffic/wait times and these data are not represented in current EPA pollution screening tools, e.g. EJScreen. District-run Toxics often record the highest concentrations in the SDAB. All these indicators, coupled with the fact that San Ysidro is home to the busiest POE in the United States, lead to a need for an air pollution monitoring presence in the community of San Ysidro.

Section 3.2.1.3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary)

This section summarizes the Near-road information (Table 3-6)

Table 3-6 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary)

MSA (name)	County (name)	Population Estimated from 2010 Census (#)	MAX AADT (2018) (#)	Location of Near-road Sites (#)	Is Near-road Site Active? (yes/no)	Number of Near-road Site(s) Needed (#)
San Diego	San Diego	3.3 Million	370,947	Rancho Carmel Dr (RCD) 06-073-1017	yes	0
			69,457	San Ysidro Blvd (SAY)* 06-073-1025	NO	1

*Site is under construction; expected operational timeline is late-2020/early-2021

Section 3.2.2 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide

The District is required to designate a monitor that routinely measures high concentrations of nitrogen dioxide. This monitor cannot be used for Regional Administrator needs. Table 3-7 lists the Area-wide NO_2 Monitoring requirements for the SDAB.

> *4.3.3(a) Requirement for Area-wide NO_2 Monitoring* [11]
> *Within the NO_2 network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales….*

Table 3-7 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide

MSA & County (name)	Population Estimated from 2010 Census (#)	Number of Area-wide NO_2 Monitors Required (#)	Number of Area-wide NO_2 Monitors Active (#)	Number of Area-wide NO_2 Monitors Needed (#)	Location of Area-wide Site (name)	Does Area-wide Site Meet NAAQS? (yes/no)
San Diego	3.3 Million	1	1	0	Donovan (DVN) 06-073-1014	yes

Section 3.2.3 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator

To obtain a pollutant profile in certain areas, often in or near Environmental Justice locations, the monitoring of NO_2 may be required by the EPA Regional Administrator. The Sherman station in Sherman Heights satisfies this requirement see Table 3-8 for this requirement.

> *4.3.4(a)Regional Administrator Required Monitoring*[12]
> *The Regional Administrators… require a minimum of forty additional NO_2 monitoring stations nationwide in any area… with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations.*

[11] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.3 "Nitrogen Dioxide (NO_2) Design Criteria", subpart 4.3.3 "Requirement for Area-wide Monitoring"
[12] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.3 "Nitrogen Dioxide (NO_2) Design Criteria", subpart 4.3.4 "Requirement for Regional Administrator Monitoring"

Table 3-8 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator

Number of Regional Administrator NO_2 Monitors Required (#)	Number of Regional Administrator NO_2 Monitors Active (#)	Number of Regional Administrator NO_2 Monitors Needed (#)	Location of Regional Administrator Site (name)	Does Regional Administrator Site Meet NAAQS? (yes/no)
1	1	0	Sherman (SES) 06-073-1026	Yes

Section 3.2.4 Minimum Monitoring Requirements for true-NO_2, PAMS

The District is required to operate PAMS sites. There are several associated requirements to operate a PAMS site (see the PAMS chapter for more detail). One of the requirements is to operate NO_x monitors. Table 3-9 lists the PAMS NO_x (NO_2) Monitoring requirements for the SDAB.

> *5(a) Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring* [13]
> *(a) State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.*
> *(b) PAMS measurements include…(4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO_2), and total reactive nitrogen (NO_y);*

Table 3-9 Minimum Monitoring Requirements for true-NO_2, PAMS

PAMS Sites/Locations (name)	Number of true-NO_2 Monitors Required at PAMS Sites (#)	Number of true-NO_2 Monitors Active at PAMS Sites (#)	Number of true-NO_2 Monitors Needed at PAMS Sites (#)
Lexington (LES) 06-073-1022	1	0	1*

*Implementation of the re-engineered PAMS required hardware have been nationally delayed.

[13] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 5, "Network Design for Photochemical Assessment Monitoring Stations (PAMS)", -subpart (4) "Hourly averaged nitrogen dioxide"

Section 3.2.5 Reactive Oxides of Nitrogen Minimum Monitoring Requirements for NCore & PAMS

The District is federally mandated to monitor NO_y levels in accordance with the CFR. This section will state the different minimum monitoring requirements for each program, e.g. NCore, PAMS, etc. that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced). Table 3-11 summarizes these requirements.

NCore

3.1 Design Criteria for NCore Sites[14]
(b) The NCore sites must measure, at a minimum, PM2.5 particle mass using continuous and integrated/filter-based samplers, speciated PM2.5, PM10-2.5 particle mass, O3, SO2, CO, NO/NOY, wind speed, wind direction, relative humidity, and ambient temperature.

PAMS

5 Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring[15]
(a) … PAMS measurements include:… (4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO2), and total reactive nitrogen (NOy);

Table 3-10 Reactive Oxides of Nitrogen Minimum Monitoring Requirements-PAMS & NCore

Number of NO_y Monitors Required at NCore & PAMS Sites (#)	Number of NO_y Monitors Active at NCore & PAMS Sites (#)	Number of NO_y Monitors Needed at PAMS & NCore Sites (#)	NCore & PAMS Sites (name)
1	1	0	Lexington (LES) 06-073-1022

Section 3.2.6 NO_2, true-NO_2, & NO_y Minimum Monitoring Requirements-Summary

Table 3-11 summarizes all the NO_2 minimum monitoring requirements from Sections 3.2.1-3.2.5.

Table 3-11 NO_2, true-NO_2, & NO_y Minimum Monitoring Requirements-Summary

Requirements for NO_2 Monitors for CFR Programs (name)	Number of Monitors Required (#)	Number of Monitors Active (#)	Number of Monitors Needed (#)
Near-road=	2	1	1*
Area-Wide=	1	1	0
Regional Administrator=	1	1	0
PAMS for true-NO_2=	1	0	1**
NCore & PAMS NOy=	1	1	0

*Under Construction **EPA approved

[14] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3(b), "Network Design for NCore Sites.
[15] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 5(a)-(b)(3), "Network Design for Photochemical Assessment Monitoring Stations (PAMS)", -subpart (3) "Ozone Monitoring Requirements"

Section 3.3 Nitrogen Dioxide Suitability for Comparison to the NAAQS

The CFR requires that for NO_2 data to be used in regulatory determinations of compliance with the NO_2 NAAQS, the NO_2 monitors must be sited according to Federal Regulations[16] and the sampling frequency must be in accordance with Federal regulations[17]. All District NO_2 monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 3-12 summarizes these requirements. There is no NAAQS for NO_y.

Table 3-12 Nitrogen Dioxide & Reactive Oxides of Nitrogen Sampling Equipment

	Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Amb	Oxides of Nitrogen Nitrogen dioxide Nitric oxide	NO_x NO_2 NO	42603 42602 42601	ppm	007	1-Hr	1	Thermo 42 series	Chemiluminescence	074	7/24	RFNA-1289-074
NCore	Reactive Oxides of Nitrogen Not Applicable Nitric oxide	NOy NOy-NO NO	42600 42612 42601	ppb	008	1-Hr	1	Thermo 42i-NOy	Chemiluminescence	574	7/24	Not Applicable

Section 3.4 Nitrogen Dioxide Concentrations for San Diego

Over the last few years, the nitrogen dioxide concentration levels have been fluctuating between 55-86 ppb. This section will illustrate the different metrics for comparison.

Section 3.4.1 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years

San Diego has measured a decrease in maximum NO_2 concentrations (Table 3-13) over the last twenty years. Over the last ten years, the NO_2 concentrations have been below 0.10 ppm. Improved emission control technology on mobile sources and emissions should contribute to a decrease in NO_2 concentrations. Note: the "Days Above the National 1-Hr Standard." row reflect the NO_2 standard for that year.

Table 3-13 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years, 1999-2019

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum 1-Hr Concentration (ppm)	0.172	0.117	0.148	0.126	0.148	0.125	0.109	0.097	0.101	0.091	0.078	0.081	0.067	0.065	0.081	0.075	0.062	0.073	0.074	0.055	0.086
Maximum Annual Average (ppm)	0.026	0.024	0.022	0.022	0.021	0.023	0.024	0.024	0.022	0.019	0.017	0.015	0.014	0.013	0.014	0.013	0.016	0.017	0.016	0.014	0.014
Days above the National 1-Hr Standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

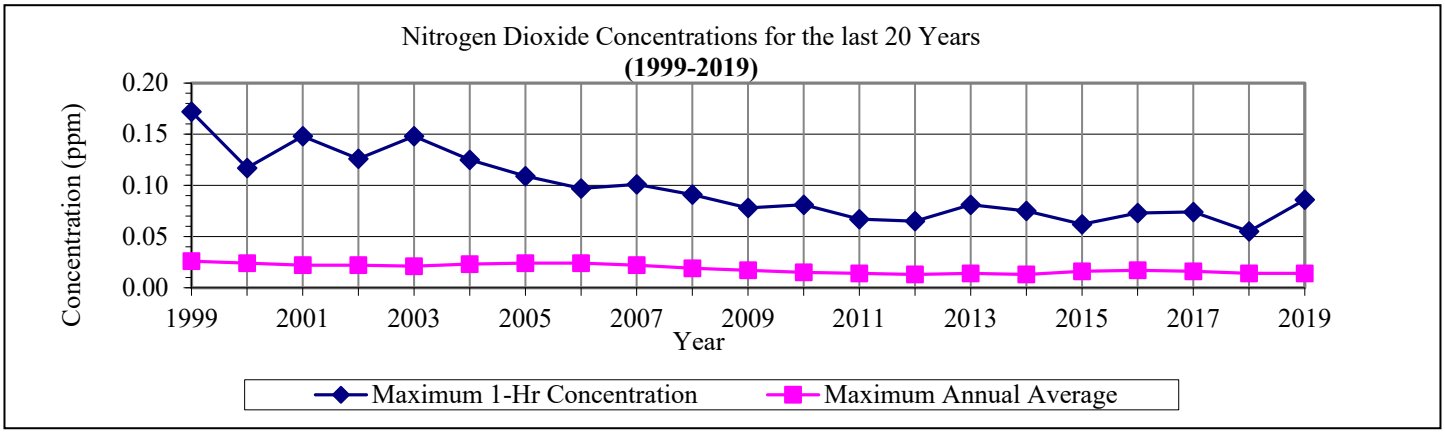


Figure 3.2 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years Graph

[16] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.
[17] (2018) 40 CFR Part 58, Subpart B, (a), "Operating Schedules".

Section 3.4.2 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year

Table 3-14 lists the maximum nitrogen dioxide measurements and NO_y-NO for each nitrogen dioxide monitoring location and NCore, respectively; Figure 3.3 shows the values graphically with respect to the National Standard for the year.

FOR INFORMATIONAL PURPOSES ONLY
NAAQS comparison requires DV calculations. Annual values are not comparable to the NAAQS

Table 3-14 Nitrogen Dioxide Concentrations for San Diego- by Site for the Year, 2019

No. (#)	Site (name)	Site Abbreviation	Maximum Concentration for 1-Hr (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
1	Camp Pendleton	CMP	0.053	0	0.004
2	Rancho Carmel Dr.	RCD	0.054	0	0.014
3	Kearny Villa Rd	KVR	0.046	0	0.007
4	Alpine	ALP	0.029	0	0.003
5	Lexington	LES	0.039	0	0.008
6	Sherman	SES	0.062	0	0.012
7	Chula Vista	CVA	0.050	0	0.008
8	Donovan	DVN	0.086	0	0.007

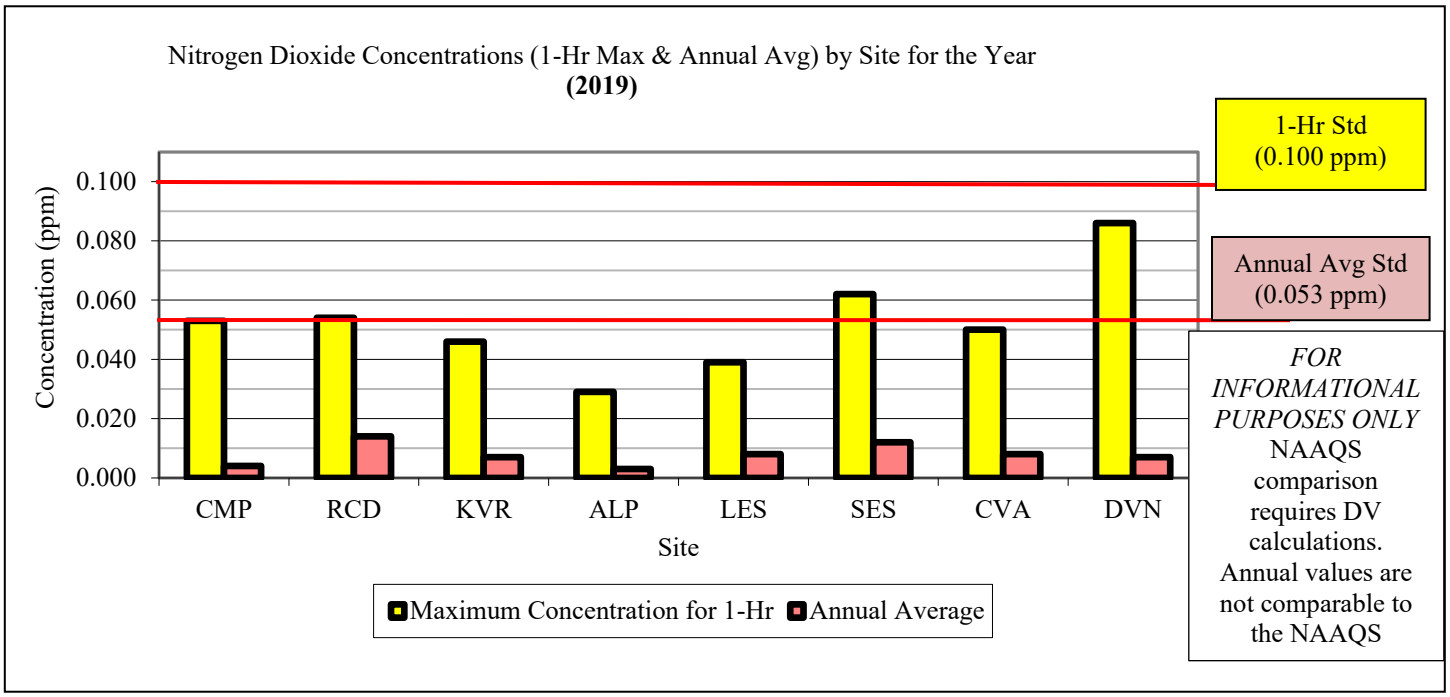


Figure 3.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year Graph

Section 3.4.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value

Table 3-15 lists the maximum nitrogen dioxide measurements and NO_y-NO for each nitrogen dioxide monitoring location and NCore, respectively; Figure 3.4 shows the values graphically with respect to the National Standard for the year.

Table 3-15 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value, 2017-2019

No. (#)	Site (name)	Site Abbreviation	Maximum Concentration 1-Hr DV (ppm)	Number of Days Above the National Standard (#)
1	Camp Pendleton	CMP	0.044	0
2	Rancho Carmel Dr.	RCD	0.049	0
3	Kearny Villa Rd	KVR	0.039	0
4	Alpine	ALP	0.020	0
5	Lexington	LES	0.038	0
6	Sherman	SES	N/A	0
7	Chula Vista	CVA	0.043	0
8	Donovan	DVN	0.048	0

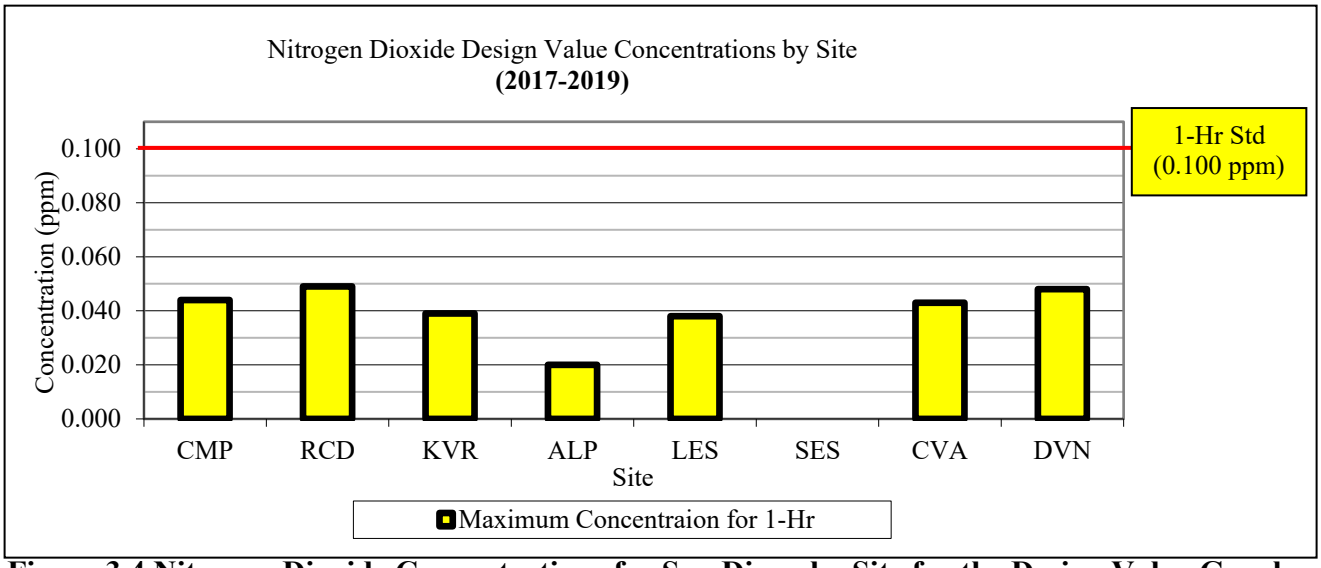


Figure 3.4 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value Graph

Chapter 4:Carbon Monoxide (CO)

Section 4.1 Carbon Monoxide Introduction

Carbon monoxide (CO) was sampled on a continuous basis at two (2) locations in the SDAB (Figure 4.1 and Table 4-2) and referenced to the carbon monoxide standards of the year (Table 4-1). The sampling equipment are listed in Table 4-2. Trace level CO was sampled at the Lexington-NCore site. For NCore details, see Chapter 9:– NCore for a complete list of all the requirements.

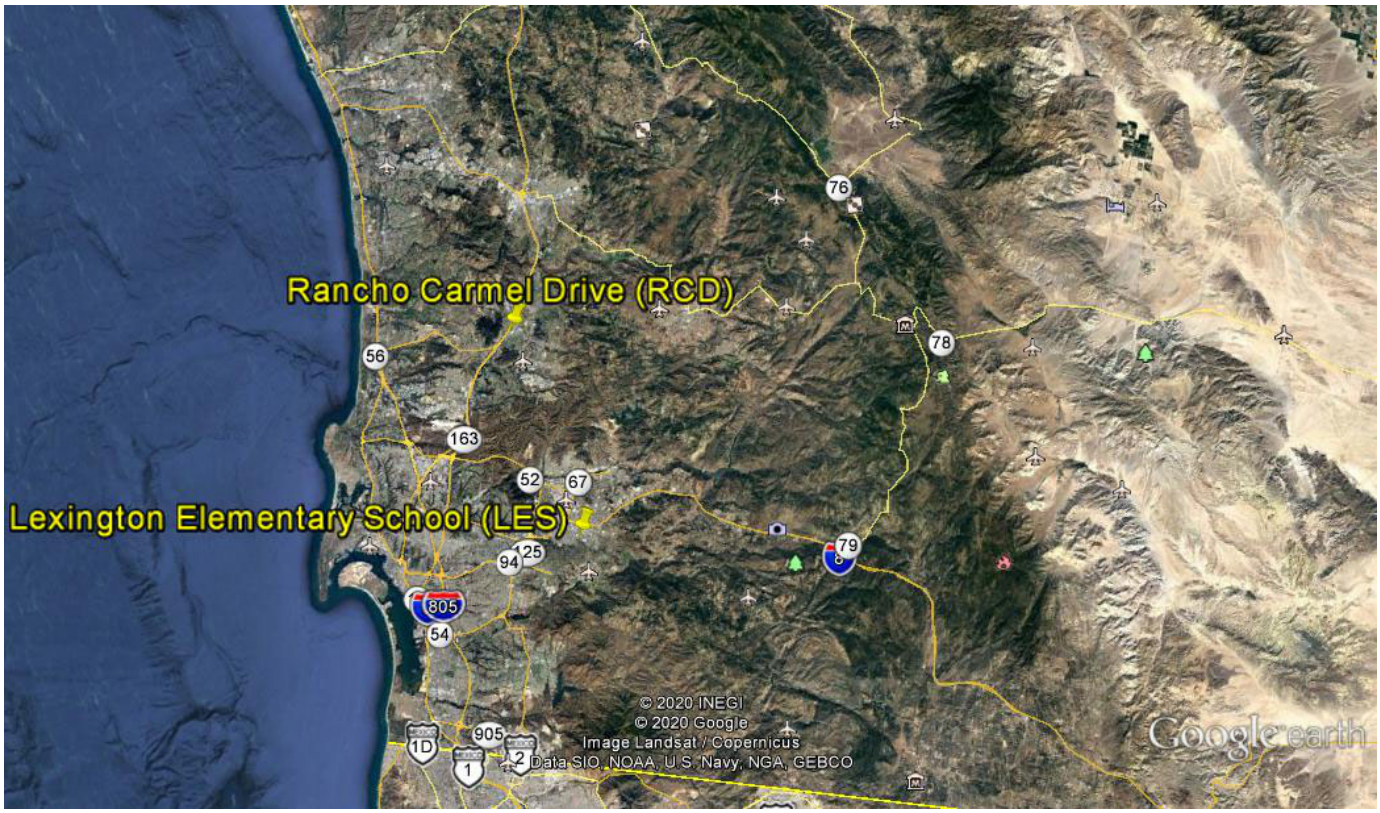


Figure 4.1 Carbon Monoxide Network Map

Table 4-1 Carbon Monoxide State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Carbon Monoxide (CO)	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Not Applicable
	8 hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	Not Applicable

Table 4-2 Carbon Monoxide Monitoring Network

	Abbreviation	LES	RCD
	Name	Lexington Elementary School	Rancho Carmel Dr.
	AQS ID	06-073-1022	06-073-1017
CO	Monitor Type	SLAMS	SLAMS
	Method	IR	IR
	Affiliation	NCORE, PAMS	NR
	Spatial Scale	NS	MI
	Site Type	PE	SO
	Objective (Federal)	PI, NAAQS	PI, NAAQS
	Equipment	Thermo 48i-TLE	Thermo 48i-TLE

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 4.2 Carbon Monoxide Minimum Monitoring Requirements

The District is federally mandated to monitor CO levels in accordance with the CFR. This section will state the different monitoring requirements for each program, e.g. ambient, PAMS, NCore, Near-road, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other CO network requirements, e.g. ambient CO monitor can fulfill a PAMS CO monitor requirement.

The District meets or exceeds all minimum requirements for CO monitoring for all programs.

Section 4.2.1 Carbon Monoxide Minimum Monitoring Requirements-Near-road

In an effort to measure concentrations for some pollutants in communities located by highly trafficked roadways, the EPA instituted the Near-road monitoring program. Table 4-3 lists the Near-road requirements.

> *4.2.1 Carbon Monoxide (CO) Design Criteria*[18]
> *(a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO_2 monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of 1,000,000 or more persons. If a CBSA has more than one required near-road NO_2 monitor, only one CO monitor is required to be collocated with a near-road NO_2 monitor within that CBSA.*

Table 4-3 Carbon Monoxide Minimum Monitoring Requirements-Near-road

MSA & County (name)	Population Estimated from 2010 Census[19] (#)	Are Near-road NO_2 Monitors Required (yes/no)	Are Collocated CO Monitors Required (yes/no)	Number of Collocated CO Monitors Required (#)	Number of Collocated CO Monitors Active (#)	Number of Collocated CO Monitors Needed (#)
San Diego	3.3 Million	Yes	Yes	1	1	0

Section 4.2.2 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator

Table 4-4 lists the Regional Administrator Designated CO Monitoring requirements for the SDAB.

> *4.2.2(a) Regional Administrator Required Monitoring*[20]
> *The Regional Administrators, in collaboration with states, may require additional CO monitors above the minimum number of monitors required in 4.2.1 of this part…*

Table 4-4 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator

Number of Regional Administrator sites Required* (#)	Number of Regional Administrator sites Active (#)	Number of Regional Administrator sites Needed (#)
0	0	0

* CO emissions in Barrio Logan were so far below the NAAQS that EPA approved the decommissioning of CO monitoring there.

[18] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.2.1 "Carbon Monoxide (CO) Design Criteria", subpart (a), "General Requirements
[19] Based on the most recent official U.S Census statistics.
[20] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.2.2 "Carbon Monoxide (CO) Design Criteria", subpart (a), "Regional Administrator Required Monitoring"

Section 4.2.3 Carbon Monoxide Minimum Monitoring Requirements-NCore

The District is required to operate a CO monitor as part of the NCore multipollutant monitoring program. This program was designed to measure pollutants at lower levels, low ppb-ppt range. Table 4-5 lists the NCore CO requirements.

> *3(b) Design Criteria for NCore Sites*[21]
> *The NCore sites must measure, at a minimum…CO…*

Table 4-5 Carbon Monoxide Minimum Monitoring Requirements-NCore

Number of CO Monitors Required at NCore Sites (#)	Number of CO Monitors Active at NCore Sites (#)	Number of CO Monitors Needed at NCore Sites (#)	NCore Sites/Location (name)
1	1	0	Lexington (LES) 06-073-1022

Section 4.2.4 Carbon Monoxide Minimum Monitoring Requirements-State (SIP)

The District must operate one non-source monitor as part of the 2004 Revision to the California State Implementation Plan (SIP) for Carbon Monoxide[22]. Table 4-6 summarizes these requirements.

Table 4-6 Carbon Monoxide Minimum Monitoring Requirements-State (SIP)

Number of CO Monitors Required for the SIP (#)	Number of CO Monitors Active for the SIP (#)	Number of CO Monitors Needed for the SIP (#)	SIP Sites/Locations (name)
1	1	0	Lexington (LES) 06-073-1022

Section 4.2.5 Carbon Monoxide Minimum Monitoring Requirements-Summary

Table 4-7 summarizes all the CO minimum monitoring requirements.

Table 4-7 Carbon Monoxide Minimum Monitoring Requirements-Summary

Requirements for CO Monitors for CFR Programs (name)	Number of CO Monitors Required (#)	Number of CO Monitors Active (#)	Number of CO Monitors Needed (#)
Near-road=	1	1	0
Regional Administrator	0	0	0
NCore=	1	1	0
SIP=	1	1	0

[21] (2018) 40 CFR Part 58, App. D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3, "Design Criteria for NCore sites", subpart (b)
[22] http://www.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf

Section 4.3 Carbon Monoxide Suitability for Comparison to the NAAQS

The CFR requires that for CO data to be used in regulatory determinations of compliance with the CO NAAQS, the CO monitors must be sited according to Federal Regulations[23] and the sampling frequency must be in accordance with Federal regulations[24]. All District CO monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 4-8 summarizes these requirements.

Table 4-8 Carbon Monoxide Suitability for Comparison to the NAAQS-Sampling Equipment

	Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Amb	Carbon monoxide	CO	42101	ppm	007	1-Hr	1	Thermo 48i-TLE*	Nondispersive infrared	554	7/24	RFCA-0981-554
NCore	Carbon monoxide Trace Level	CO	42101	ppb	008	1-Hr	1	Thermo 48i-TLE	Nondispersive infrared	554	7/24	RFCA-0981-554

* Instrument operated at ambient level range of 20 ppm

Section 4.4 Carbon Monoxide Concentrations for San Diego

This section will illustrate the different metrics for comparison for carbon monoxide concentration levels.

Section 4.4.1 Carbon Monoxide Concentrations for San Diego-for the Last 20 years

In San Diego, CO has decreased over the years (Table 4-9) and is shown graphically in Figure 4.2 for CO concentrations. The 2003 Wildfires caused the SDAB to exceed the standards for CO, but the exceedances are considered an exceptional event and do not have a lasting impact in the air basin. Even with the last two wildfires in 2003 and 2007, the County still qualifies for attainment status. Note: the "Days Above the National Standard" row in Table 4-9 reflect the carbon monoxide standards for that year.

Table 4-9 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years, 1999-2019

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum 1-Hr Concentration (ppm)	9.9	9.3	8.5	8.5	12.7	6.9	7.9	10.8	8.7	5.6	4.6	3.9	3.5	4.4	3.2	3.8	3.1	2.2	2.0	1.9	4.1
Maximum 8-Hr Concentration (ppm)	6.0	5.9	5.1	4.7	10.6	4.1	4.7	3.6	5.2	3.5	3.4	2.5	2.4	3.8	2.6	3.0	2.0	1.7	1.5	1.4	2.5
Days above the National Standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

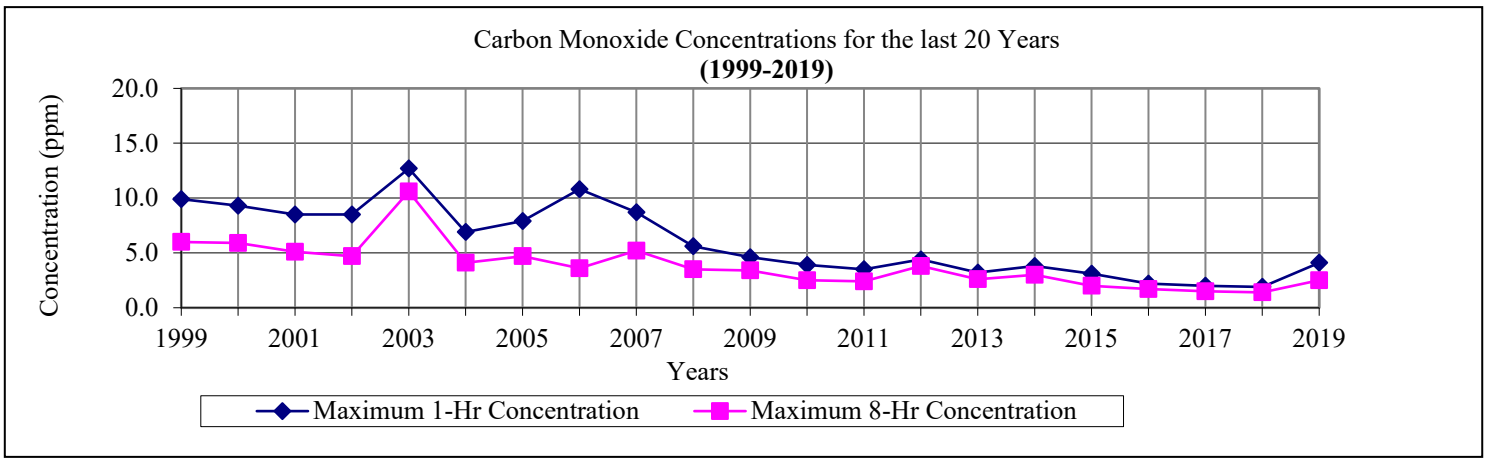


Figure 4.2 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years Graph

[23] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.
[24] (2018) (2018) 40 CFR Part 58, Subpart B, (a), "Operating Schedules".

Section 4.4.2 Carbon Monoxide Concentrations for San Diego-by Site for the Year

Table 4-10 lists the maximum carbon monoxide measurements for each carbon monoxide monitoring location and NCore; Figure 4.3 shows the values graphically with respect to the National Standard.

Table 4-10 Carbon Monoxide Concentrations for San Diego-by Site for the Year, 2019

No. (#)	Site (name)	Site Abbreviation	Maximum Concentration for 8-Hr (ppm)	Maximum Concentration for 1-Hr (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
1	Lexington	LES	1.0	1.3	0	0.303
2	Rancho Carmel Dr.	RCD	2.5	4.1	0	0.497

FOR INFORMATIONAL PURPOSES ONLY
Annual values are not comparable to the NAAQS

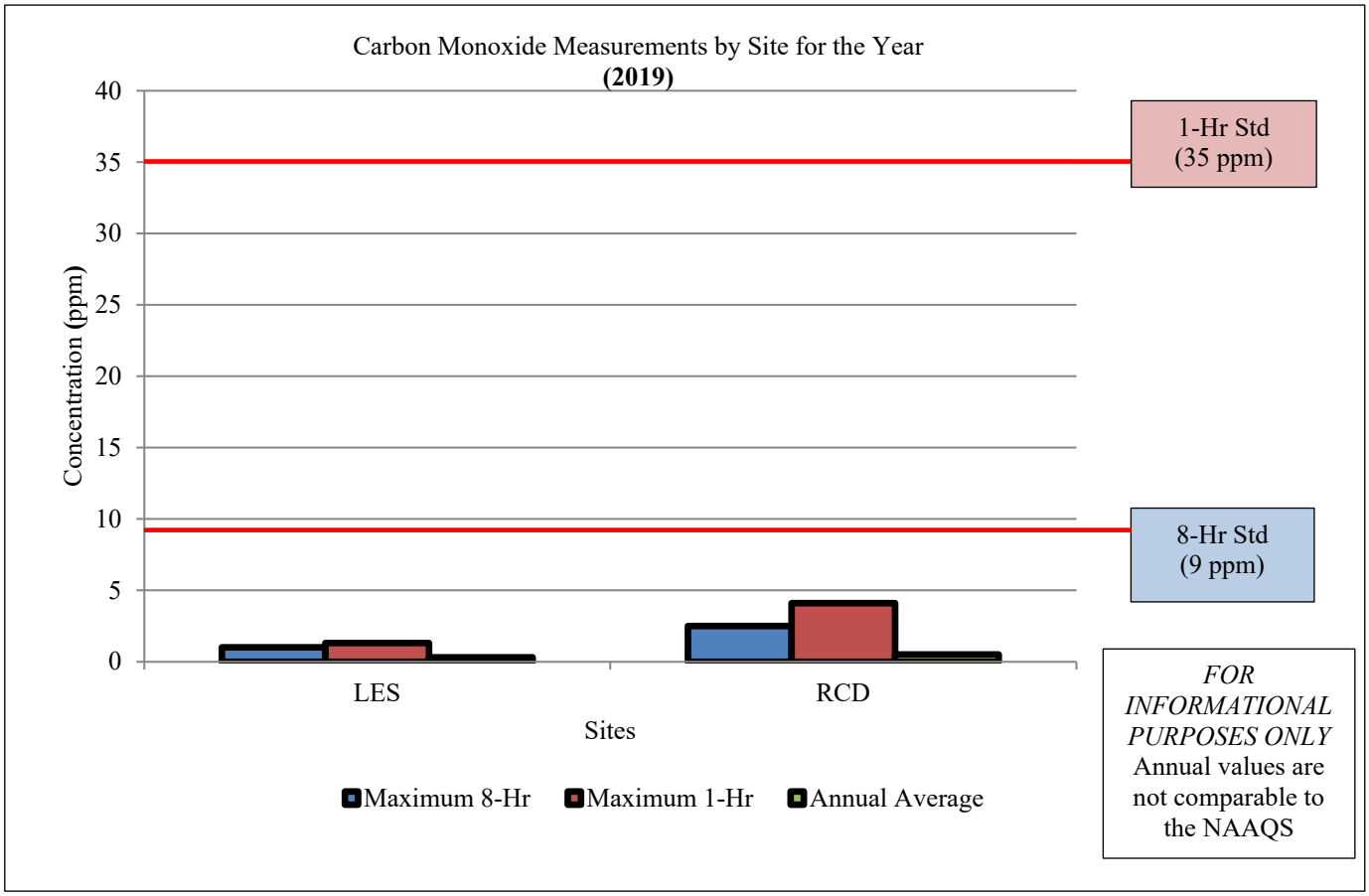


Figure 4.3 Carbon Monoxide Concentrations for San Diego-by Site for the Year Graph

Chapter 5: Sulfur Dioxide (SO_2)

Section 5.1 Sulfur Dioxide Introduction

Only trace level sulfur dioxide is sampled for at one (1) location (Figure 5.1) in the SDAB and is referenced to the sulfur dioxide standards of the year (Table 5-1). Trace-level SO_2 was sampled at the Lexington-NCore site. Table 5-2 lists the equipment. See Chapter 9:– NCore for detailed requirements.

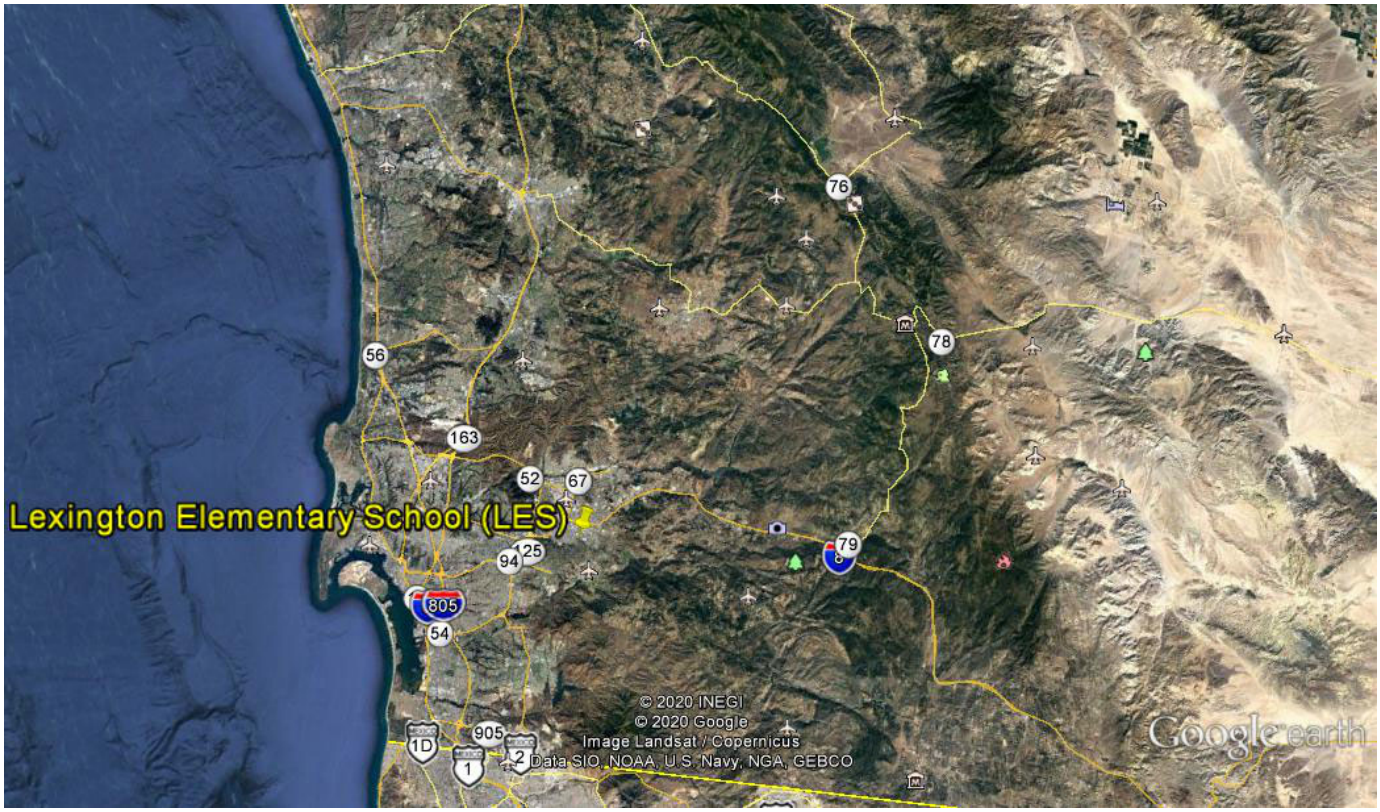


Figure 5.1 Sulfur Dioxide Network Map

Table 5-1 Sulfur Dioxide State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm (665 µg/m^3)	75 ppb (196 µg/m^3)	Not Applicable
	3 hour	Not Applicable	Not Applicable	0.5 ppm (1300 µg/m^3)
	24 hour	0.04 ppm (105 µg/m^3)	Not Applicable in San Diego	Not Applicable
	Annual Arithmetic Mean	Not Applicable	Not Applicable in San Diego	Not Applicable

Table 5-2 Sulfur Dioxide Monitoring Network

	Abbreviation	LES
	Name	Lexington Elementary School
	AQS ID	06-073-1022
SO_2	Monitor Type	SLAMS
	Method	FL
	Affiliation	NCore
	Spatial Scale	NS
	Site Type	PE
	Objective (Federal)	PI, NAAQS
	Equipment	Thermo 43i-TLE

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 5.2 Sulfur Dioxide Minimum Monitoring Requirements

The District is federally mandated to monitor SO_2 levels in accordance with the CFR. This section will state the different monitoring requirements for each program, ambient, NCore, etc. that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other SO_2 network requirements, e.g. ambient SO_2 monitor can fulfill a PAMS SO_2 monitor requirement.

The District meets or exceeds all minimum requirements for SO_2 monitoring for all programs.

Section 5.2.1 Sulfur Dioxide Minimum Monitoring Requirements-NCore

The District is required to operate a NCore site. There are several associated requirements to operate this site. Table 5-3 lists NCore Sulfur Dioxide (SO_2) monitoring requirements.

> *3.1 Design Criteria for NCore Sites*[25]
> *(b) The NCore sites must measure, at a minimum, PM2.5 particle mass using continuous and integrated/filter-based samplers, speciated PM2.5, PM10-2.5 particle mass, O3, SO2, CO, NO/NOY, wind speed, wind direction, relative humidity, and ambient temperature.*

Table 5-3 Sulfur Dioxide Minimum Monitoring Requirements-NCore

MSA & County	Number of NCore SO_2 Monitors Required (#)	Number of NCore SO_2 Monitors Active (#)	Number of NCore SO_2 Monitors Needed (#)	Met NAAQS? (yes/no)
San Diego	1	1	0	yes

Section 5.2.2 Sulfur Dioxide Minimum Monitoring Requirements-Ambient

The procedure to determine the minimum number of ambient level monitors required is different than the other gaseous criteria pollutants. It is based on the total SO_2 emissions in the air basin with respect to the population of the air basin. Table 5-4 lists these requirements.

> *4.4.2(a) Sulfur Dioxide Design Criteria Requirement for Monitoring by Population Weighted Emissions Index*[26]
> *The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO_2 monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of SO_2 in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO_2 monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO_2 monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required within that CBSA.*

---

[25] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3(b), "Network Design for NCore Sites.
[26] (2018) CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.4 "Sulfur Dioxide (SO_2) Design Criteria, subpart 4.4.2(a) "Requirement for Monitoring by the Population Weighted Emissions Index"

If the PWEI is below a certain threshold, the EPA allows Districts the minimum required SO_2 monitor to be the NCore SO_2 required monitor. Table 5-5 lists these requirements

> *4.4(1)Sulfur Dioxide (SO_2) Design Criteria*[27]
> *The SO_2 monitoring site(s) required as a result of the calculated PWEI in each CBSA shall satisfy minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types: population exposure, highest concentration, source impacts, general background, or regional transport. SO_2 monitors at NCore stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors under this part.*

Table 5-4 Sulfur Dioxide Minimum Monitoring Requirements - EPA NEI SO_2

MSA & County (name)	Population Estimated from 2010 Census[28] (yes/no)	Total SO_2 Emissions from NEI (tons/yr)	Total SO_2 Emissions ÷ 1,000,000 (TPY-1M)	Calculated PWEI= Total SO_2 Emissions x Population (MPeople-TPY)
San Diego	3.3 Million	1,444	0.0001444	4,765.2

Table 5-5 Sulfur Dioxide Minimum Monitoring Requirements-Ambient

Calculated PWEI (MP-TPY)	Are the Emissions <5,000 MP-TPY? (yes/no)	Number of Required SO_2 Monitors Monitors (#)	Number of Active SO_2 Monitors Monitors (#)	Number of Ambient SO_2 Monitors Needed (#)
4,765.2	Yes	1	1	0

Section 5.2.3 Sulfur Dioxide Minimum Monitoring Requirements-Summary

Table 5-6 summarizes all the SO_2 minimum monitoring requirements from Sections 5.2.1-5.2.2.

Table 5-6 Sulfur Dioxide Minimum Monitoring Requirements-Summary

CFR Programs Requirements for SO_2 Monitors (name)	Number of SO_2 Monitors Required (#)	Number of Active SO_2 Monitors (#)	Number of Needed SO_2 Monitors (#)
PWEI	1	1	*0
NCore	1	1	*0

*For the SDAB, the PWEI is less than 5,000, which means the NCore SO_2 monitor is allowed to be used in the count for required PWEI SO_2 monitors; therefore, the total count of SO_2 monitor is "1" in the SDAB.

[27] (2018) CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.4 "Sulfur Dioxide (SO_2) Design Criteria, subpart 4.4.2(1) "Requirement for Monitoring by the Population Weighted Emissions Index"
[28] Based on the most recent official U.S Census statistics.

Section 5.3 Sulfur Dioxide Suitability for Comparison to the NAAQS

The CFR requires that for SO_2 data to be used in regulatory determinations of compliance with the SO_2 NAAQS, the SO_2 monitors must be sited according to Federal Regulations[29] and the sampling frequency must be in accordance with Federal regulations[30]. All District SO_2 monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 5-7 summarizes these requirements.

Table 5-7 Sulfur Dioxide Suitability for Comparison to the NAAQS-Sampling Equipment

	Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
NCore	Sulfur dioxide Trace Level SO_2	42101	ppb	008	1-Hr	1 5-min	Thermo 43i-TLE	Fluorescence	560	7/24	EQSA-0486-060

Section 5.4 Sulfur Dioxide Concentrations for San Diego

Over the years, sulfur dioxide concentration levels have been decreasing. This section will illustrate the different metrics for comparison.

Section 5.4.1 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years

Emissions of sulfur dioxide (SO_2) have declined tremendously in California over the last 20 years, due to improved source controls and switching from fuel oil to natural gas for electric generation and industrial boilers. Note: the "Days Above National Standard" row in Table 5-8 reflects the SO_2 standards for that year and are shown graphically in Figure 5.2.

Table 5-8 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years, 1999-2019

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum 1-Hr Concentration (ppm)	0.084	0.058	0.060	0.044	0.036	0.045	0.040	0.045	0.027	0.037	0.029	0.027	0.001	0.002	0.007	0.001	0.001	0.001	0.001	0.003	0.001
Maximum 24-Hrs Concentration (ppm)	0.019	0.012	0.014	0.012	0.011	0.015	0.013	0.011	0.009	0.008	0.009	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Maximum Annual Average (ppm)	0.003	0.004	0.004	0.004	0.004	0.006	0.005	0.004	0.003	0.003	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Days above the National Standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

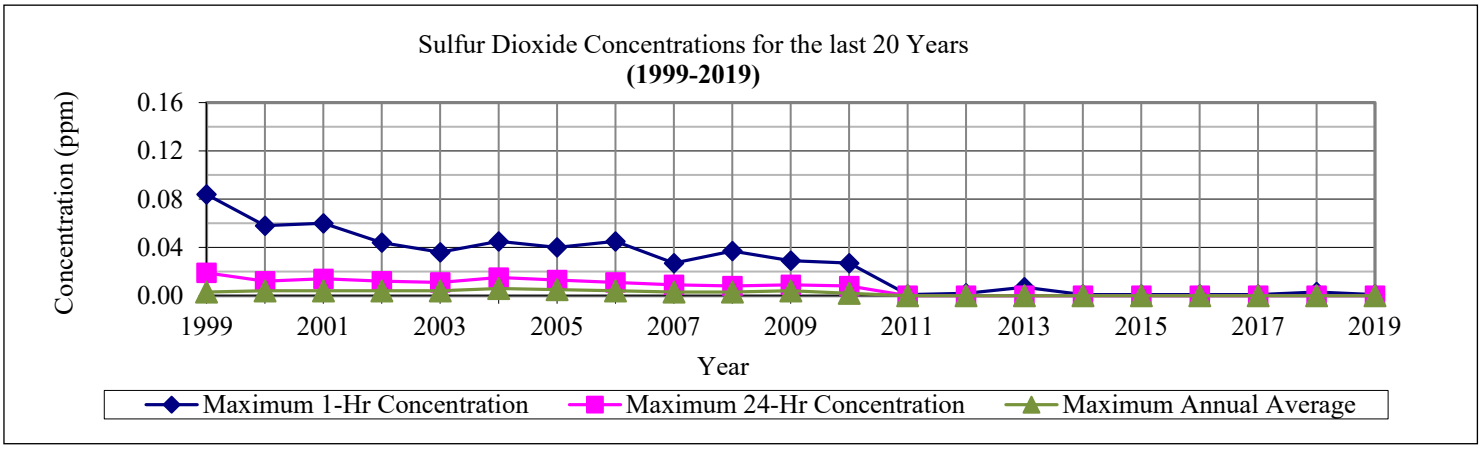


Figure 5.2 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years Graph

[29] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.
[30] (2018) 40 CFR Part 58, Subpart B, (a), "Operating Schedules".

Section 5.4.2 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value

Table 5-9 lists the maximum sulfur dioxide measurements for the NCore monitoring location and Figure 5.3 shows the values graphically with respect to the National Standard.

Table 5-9 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value, 2017-2019

Site (site)	Site Abbreviation	Design Value Maximum Concentration 1-Hr (ppm)	Number of Days Above the National Standard (#)
Lexington	LES	0.001	0

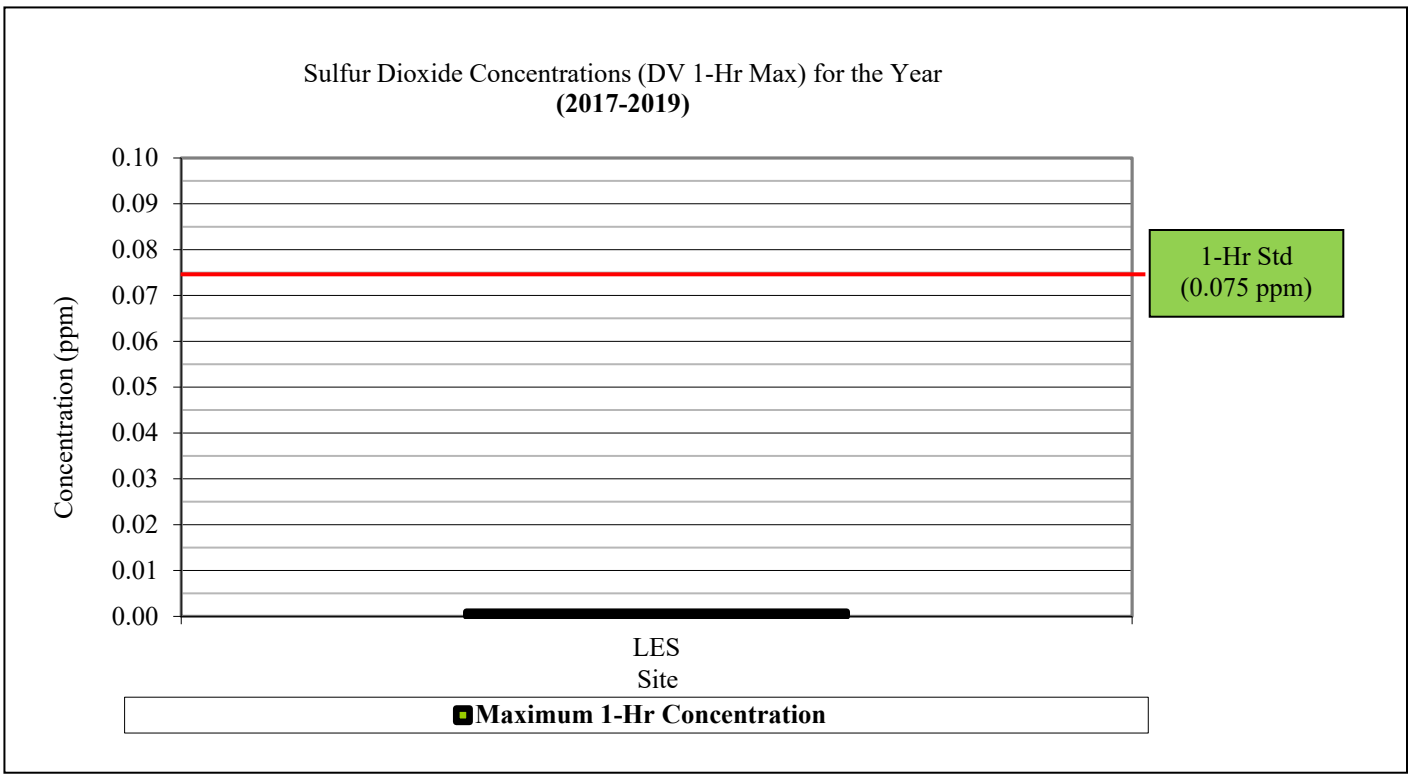


Figure 5.3 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value Graph

Chapter 6: Lead (Pb)

Section 6.1 Lead Introduction

Regulatory Lead (Pb) was sampled for at one location in the SDAB (Figure 6.1 and Table 6-2) and referenced to the lead standards of the year (Table 6-1). Source level lead was sampled at McClellan-Palomar airport.

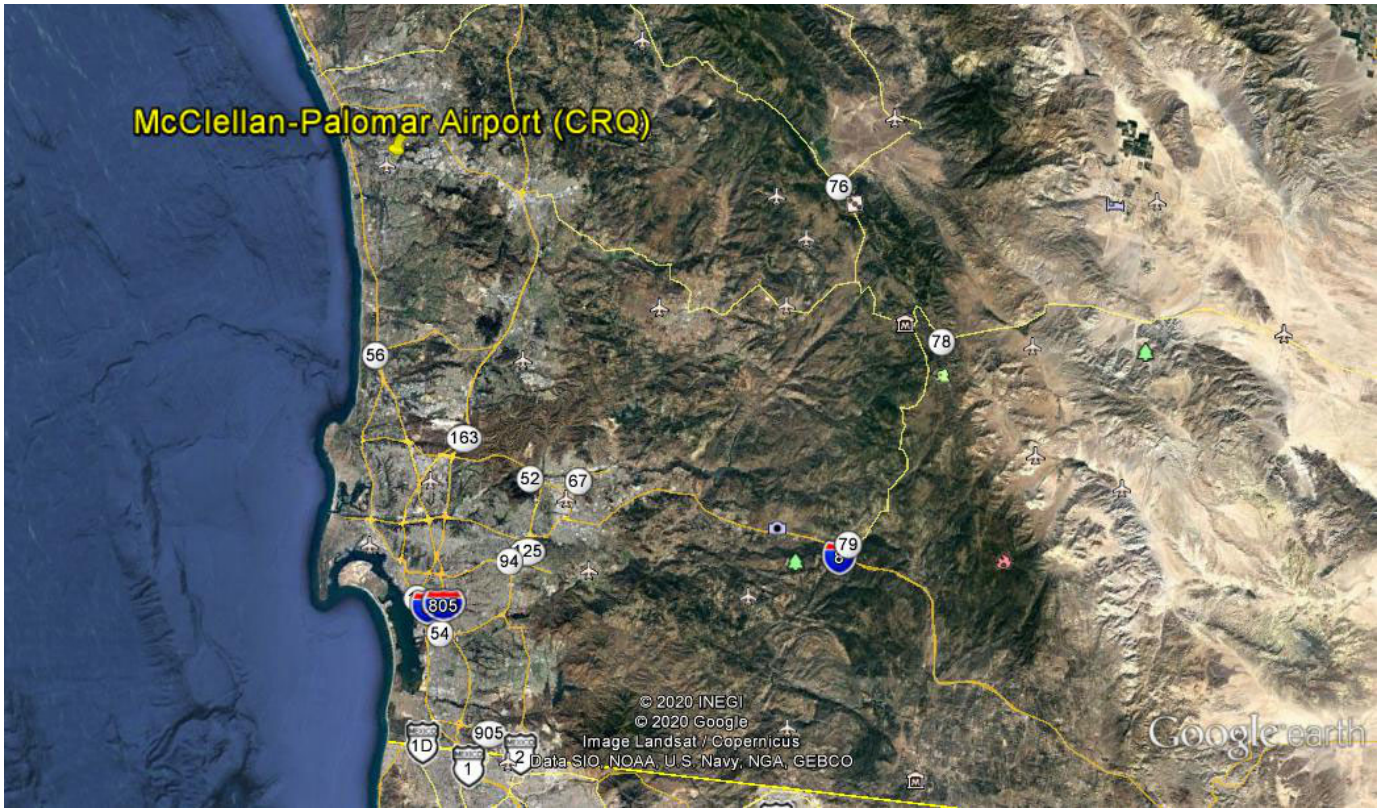


Figure 6.1 Lead Network Map

Table 6-1 Lead State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Lead (Pb)	30 Day Average	1.5 µg/m^3	Not Applicable	Not Applicable
	Calendar Quarter	Not Applicable	1.5 µg/m^3 (for certain areas)	1.5 µg/m^3 (for certain areas)
	Rolling 3-Month Average	Not Applicable	0.15 µg/m^3	0.15 µg/m^3

Table 6-2 Lead Sampling Network (regulatory collection and analysis)

	Abbreviation	CRQ	
	Name	Palomar Airport	
	AQS ID	06-073-1023	
Lead	Monitor Type	SLAMS	SLAMS
	Designation	O	QAC
	Method	HV	HV
	Affiliation	Not Applicable	Not Applicable
	Spatial Scale	MI	MI
	Site Type	SO	QA
	Objective (Federal)	NAAQS	NAAQS
	Analysis	APCD	APCD
	Frequency	1:6	1:6
	Equipment	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
EXDN= Extreme downwind
HC= Highest concentration
MXO= Maximum ozone concentration
MXP= Maximum precursor impact
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood
US= Urban Scale

Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutant Monitoring Stations
NR= Near-road
PAMS= Photochemical Assessment Monitoring Stations
UNPAMS= Unofficial PAMS site

Monitor Designation
PRI= Primary
QAC= Collocated
O= Other

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information

Section 6.2 Lead Minimum Monitoring Requirements

The District is federally mandated to monitor Pb levels in accordance with the CFR. This section will state the different minimum monitoring requirements for each program, e.g. ambient, NCore, Airports, etc. that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced).

The District meets or exceeds all minimum requirements for Pb monitoring for all programs.

Section 6.2.1 Lead Minimum Monitoring Requirements-Source (non-Airport) & Source (Airport)

The procedure to determine the minimum number of non-Airport source level monitors required is based on any non-Airport source emitting more than 0.5 tons/year of Pb emissions. Table 6-3 lists these requirements for non-Airport sources. The procedure to determine the minimum number of Airport source level monitors is the same, except that the threshold is 1.0 tons/year. Table 6-4 lists these requirements for Airport source level sampling. The sources and their Pb emissions are from the latest published EPA NEI database.

> *4.5(a) Lead (Pb) Design Criteria*[31]
> *State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (http://www.epa.gov/ttn/chief/eiinformation.html) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure…*

Table 6-3 Lead Minimum Monitoring Requirements-Source (non-Airport) based on the NEI

MSA & County (name)	From NEI[32] Any Non-Airport Pb Sources >0.5 TPY? (yes/no)	From NEI What is the Largest Non-Airport Pb Source?	From NEI What is the Largest Non-Airport Pb Emissions Rate? (TPY)	Number of Non-Airport Sources Pb Monitors Required (#)	Number of Non-Airport Sources Pb Monitors Active (#)	Number of Non-Airport Sources Pb Monitors Needed (#)
San Diego	No	Camp Pendleton	0.23	0	0	0

Table 6-4 Lead Minimum Monitoring Requirements-Source (Airport) based on the NEI

MSA & County (name)	From NEI Any Airport Pb Sources >=1.0 TPY? (yes/no)	From NEI What is the Largest Airport Pb Source (TPY)	From NEI What is the Largest Airport Pb Emissions Rate? (TPY)	Number of Airport Sources Pb Monitors Required (#)	Number of Airport Sources Pb Monitors Active (#)	Number of Airport Sources Pb Monitors Needed (#)
San Diego	No	Montgomery Field	0.59	0	0	0

[31] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.5 "Lead (Pb) Design Criteria", subsection (a)
[32] Most complete and recent EPA NEI Data base, 2017

Section 6.2.2 Lead Minimum Monitoring Requirements-Special Study (Airport)

One EPA regulation states that if an airport emits less than 1.0 TPY of Pb emissions, no source sampling is required. The EPA added a regulation that listed several airports to undergo temporary Pb sampling, regardless if the NEI listed Pb emissions were less than 1.0 TPY. If emissions exceeded the NAAQS by 50%, the sampler was to become permanent, or until the emissions were proven to be less than 50% of the NAAQS (over a minimum 3-yr period). Table 6-5 lists these requirements.

> *4.5(iii) Lead (Pb) Design Criteria*[33]
> *…agencies are required to conduct ambient air Pb monitoring near each of the airports listed in Table D-3A for a period of 12 consecutive months … shall use an approved Pb-TSP Federal Reference Method…Any monitor that exceeds 50 percent of the Pb NAAQS on a rolling 3-month average (as determined according to 40 CFR part 50, Appendix R) shall become a required monitor under paragraph 4.5(c) of this Appendix, and shall continue to monitor for Pb unless a waiver is granted …*

Table D-3A Airports to be Monitored for Lead

Airport	**County**	**State**
McClellan-Palomar	San Diego	*CA*
Gillespie Field	San Diego	*CA*

Table 6-5 Lead Minimum Monitoring Requirements - Airport (Special Study) Results

Names of Airport Monitors Required (name)	Was Airport Testing Done? (yes/no)	Is Airport Testing Concluded? (yes/no)	Did the Airport Pass? (yes/no)	Does the Airport Require Continued Sampling? (yes/no)	Is Continued Sampling Active? (yes/no)	Number of Continued Sampling Sites Needed (#)
McClellan-Palomar	yes	yes	NO	YES	YES	0
*Gillespie Field	yes	yes	yes	no	Not Applicable*	Not Applicable

*Gillespie Field

The Airport study at Gillespie Field officially concluded and it was determined by EPA to discontinue all lead sampling at this airport.

McClellan-Palomar

The Airport study at McClellan-Palomar Airport officially concluded and the airport did not pass the minimum tolerances. Consequently, permanent sampling was established. The concentrations for lead have met the waiver criteria (three continuous years of sampling at this location and less than 50% of the NAAQS) and the District has requested the cessation of regulatory lead sampling (pending EPA approval).

Section 6.2.3 Lead Minimum Monitoring Requirements-Regional Administrator

The EPA Regional Administrator may require additional lead sampling beyond what is required in section 4.5 particularly near industrial sources of lead. No industrial sources of lead have required additional monitoring as directed by the EPA Regional Administrator. Table 6-6 lists these requirements.

> *4.5(c) Lead (Pb) Design Criteria*[34]
> *The EPA Regional Administrator may require additional monitoring beyond the minimum monitoring requirements contained in paragraph 4.5(a) of this appendix …*

[33] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.5 "Lead (Pb) Design Criteria", subsection (iii)
[34] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.5 "Lead (Pb) Design Criteria", subsection (c)

Table 6-6 Lead Minimum Monitoring Requirements-Regional Administrator

MSA & County (name)	Number of Regional Administrator Pb Monitors Required (#)	Number of Regional Administrator Pb Monitors Active (#)	Number of Regional Administrator Pb Monitors Needed (#)
San Diego	0	0	0

Section 6.2.4 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA

Table 6-7 summarizes the collocation requirements for quality assurance purposes.

3.4.4.1 A PQAO must[35] (a) Have 15 percent of the primary monitors (not counting non-source oriented NCore sites in PQAO) collocated. Values of 0.5 and greater round up; and
(b) Have at least one collocated quality control monitor (if the total number of monitors is less than three).

3.4.7… In addition[36], each year, four collocated samples from PQAOs with less than or equal to five … must be sent to an independent laboratory, the same laboratory as the performance evaluation audit, for analysis.

Table 6-7 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA

Number of Pb-TSP Samplers Required (#)	Number of Pb-TSP Samplers Active (#)	Number of Pb-TSP Samplers Calculated for Collocation (#)	Number of Pb-TSP Samplers Active for Collocation (#)	Number of Pb-TSP Samplers Needed for Collocation (#)	Location of Collocated Site (name)	Are four collocated samples sent to PEP laboratory for analysis? (yes/no)
1	1	1 x (15%) = 1	1	0	Palomar (CRQ) 06-073-1023	Yes

Section 6.2.5 Lead Minimum Monitoring Requirements-Summary

Table 6-8 summarizes the Pb minimum monitoring requirements.

Table 6-8 Lead Minimum Monitoring Requirements-Summary

CFR Programs Pb-TSP Samplers Requirements (name)	Number of Pb-TSP Samplers Required (#)	Number of Pb-TSP Samplers Active (#)	Number of Pb-TSP Samplers Needed (#)
Source (non-Airport) =	0	0	0
Source (Airport)=	0	0	0
Airport Study=	0	0	0
Airport Study Exceedance=	1*	1	0
Regional Administrator=	0	0	0
QA Collocation=	1	1	0
QAC filters sent to EPA for analysis	4	4	0

* The District is seeking EPA approval do discontinue regulatory lead sampling at Palomar Airport.

[35] (2018) 40 CFR Part 58, Appendix A, Section 3, Measurement Quality Check Requirements, chapter 3.4, section 3.4.4.1 (a)-(b)
[36] (2018) 40 CFR Part 58, Appendix A, Section 3, Measurement Quality Check Requirements, chapter 3.4, section 3.4.7

Section 6.3 Lead Suitability for Comparison to the NAAQS

The CFR requires that for Pb data to be used in regulatory determinations of compliance with the Pb NAAQS, the Pb monitors must be sited according to Federal Regulations[37] and the sampling frequency must be in accordance with Federal regulations. All District Pb monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 6-9 and Table 6-10 summarize these requirements.

Table 6-9 Lead Suitability for Comparison to the NAAQS-Sampling Equipment

Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Lead	Pb	14129	µg/m^3 LC	105	24-Hr	7	Tisch TE-5170 BLVFC+	ICP/MS Acid filter extract with hot nitric acid	192	1:6	EQL-0710-192

Section 6.3.1 Lead Suitability for Comparison to the NAAQS – Operating Frequency

The CFR requires that for Pb-TSP data to be used in regulatory determinations of compliance with the Pb NAAQS, the Pb-TSP samplers' sampling frequency must be in accordance with Federal regulations All District Pb-TSP samplers meet or exceed all minimum monitoring requirements for the sampling frequency and can be compared to the NAAQS. Table 6-10 summarizes these requirements.

> *58.12(e) Operating schedules*
> *For PM_{10} samplers, a 24-hour sample must be taken from midnight to midnight (local standard time) to ensure national consistency. The minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with respect to the 24-hour standard as illustrated in Figure 1 below…. The minimum sampling schedule for all other sites in the area remains once every six days.*

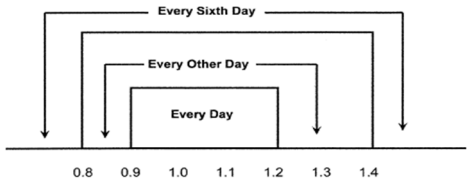


Figure 1 – Ratio to Standard

Table 6-10 Lead Suitability for Comparison to the NAAQS-Sampling Equipment

What is the Minimum EPA Permitted Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
1:6	1:6	yes

[37] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.

Section 6.4 Lead Concentrations for San Diego

Over the years, lead concentrations decreased so much that ambient sampling was no longer required. In 2012, the EPA lowered the NAAQS and sampling resumed. This section will illustrate the different metrics for comparison.

Section 6.4.1 Lead Concentrations for San Diego-for the Last 20 Years

The rapid decrease in lead emissions since the 80s can be attributed primarily to phasing out the lead in gasoline in the 70s by EPA and CARB. Note: the "Days Above National Standard" row in Table 6-11 and Figure 6.2 reflect the lead standard for that year. No Testing (NT) was done in the SDAB from 1997 until 2012. The measured concentrations for 2012 are from the NCore location, which is categorized as neighborhood scale and representative concentrations. The airport sampler is categorized as source impact and microscale, and is not considered representative concentrations.

Table 6-11 Lead Concentrations for San Diego-for the Last 20 Years, 1999-2019

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum Calendar Quarter ($\mu g/m^3$)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.006	0.007	0.010	0.015	0.010	0.020	0.020	0.020
Maximum Rolling 3-Month Average ($\mu g/m^3$)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.006	0.007	0.011	0.015	0.010	0.020	0.020	0.020
Days above the National Standard	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0	0	0	0	0	0	0	0

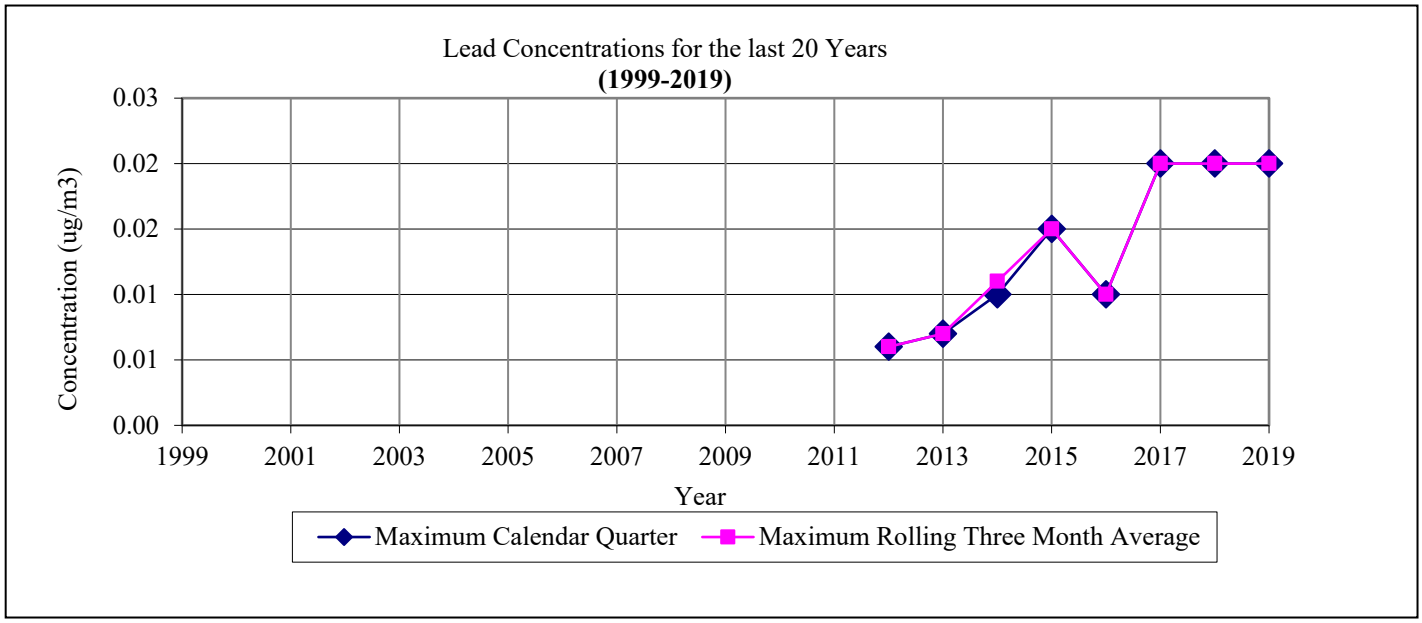


Figure 6.2 Lead Concentrations for San Diego-for the Last 20 Years

Section 6.4.2 Lead Concentrations for San Diego-by Site for the Year

Table 6-12 lists the maximum lead measurements for each lead monitoring location; Figure 6.3 shows the values graphically with respect to the National Standard.

Table 6-12 Lead Concentrations for San Diego-by Site for the Year

No. (#)	Site (name)	Site Abbreviation	Maximum Rolling 3-Month Average **2019** (µg/m^3)	Design Value Maximum Calendar Quarter **2019** (µg/m^3)	Number of Days Above the NAAQS **2019** (#)
2	Palomar Airport*	CRQ	0.020	0.020	0

*Source impact and microscale monitors.

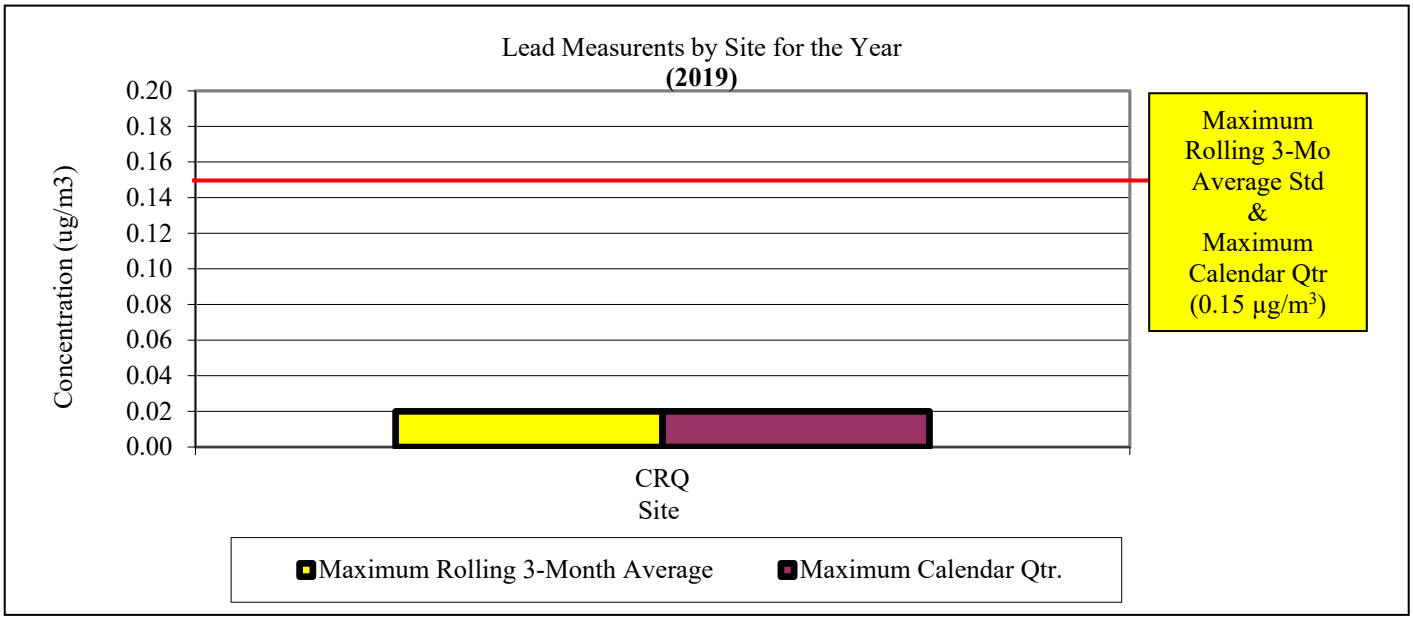


Figure 6.3 Lead Concentrations for San Diego-by Site for the Year Graph

The measured concentrations at the Palomar Airport location have been consistently well below the NAAQS and has been for three (3) contiguous years of operations. Because of this, the District is petitioning the EPA to decommission Pb-TSP/Regulatory sampling at this location. If approved, the District, will sample for Pb, as well as other metals, for the EPA Toxics-Metals program.

Chapter 7: Particulate Matter 2.5 µm ($PM_{2.5}$)

Section 7.1 $PM_{2.5}$ Introduction

$PM_{2.5}$ was sampled on both a continuous basis and sequentially (on a schedule set by the EPA) at several locations in the SDAB (Figure 7.1 and Table 7-2) and were referenced to the $PM_{2.5}$ standards of the year (Table 7-1), when applicable. The equipment is listed in Table 7-2. Please note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and relocated the station 20 meters southeast of the original location to be on San Diego County property and is currently under construction.

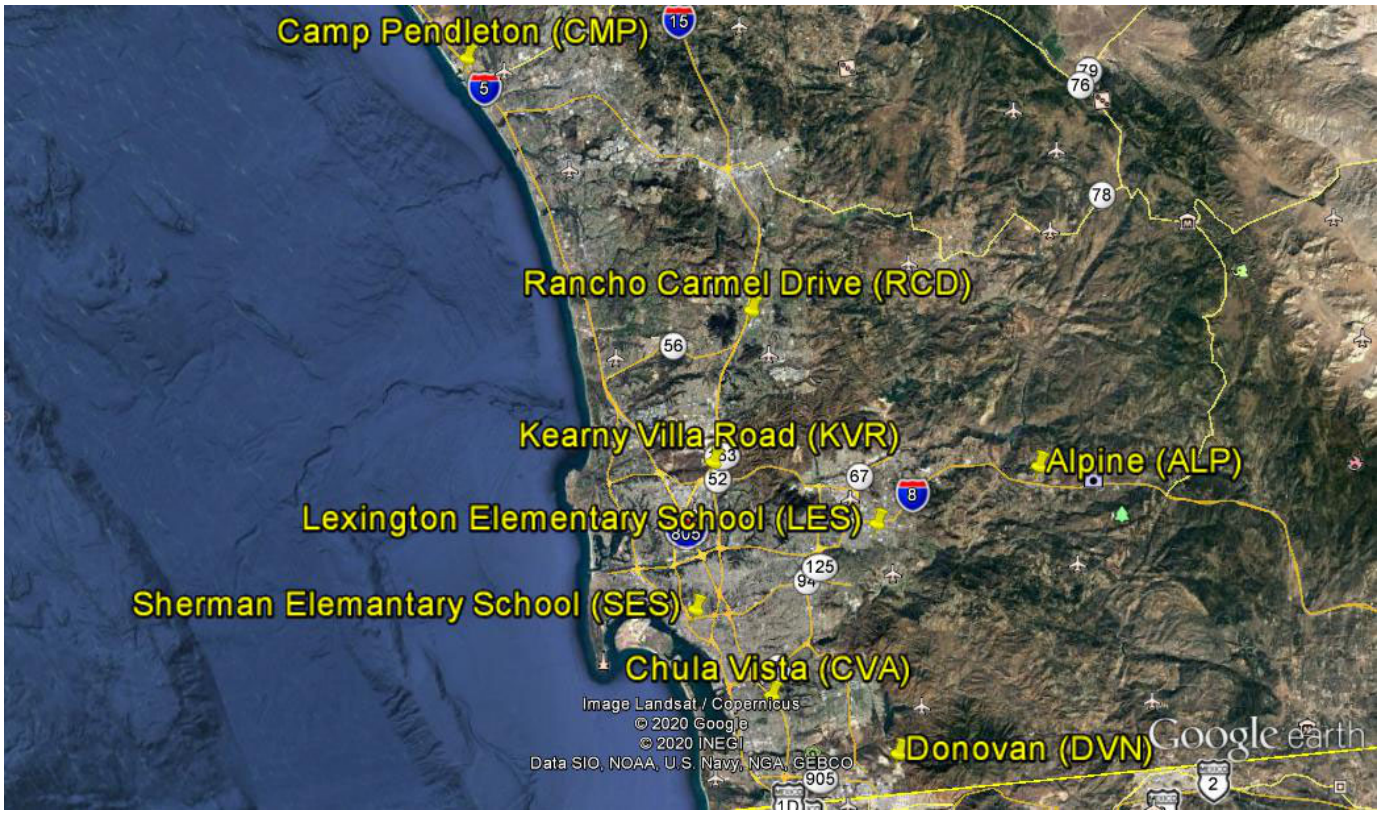


Figure 7.1 $PM_{2.5}$ Network Map

Table 7-1 $PM_{2.5}$ State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Fine Particulate Matter ($PM_{2.5}$)	24 hour	Not Applicable	35 µg/m^3	35 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	15 µg/m^3

Table 7-2 $PM_{2.5}$ Sampling Network

Site Abbreviation		ALP	CMP	CVA	LES		KVR		DVN	SES	RCD
Site Name		Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School		Kearny Villa Rd		Donovan	Sherman Elementary School	Rancho Carmel Drive
AQS ID		06-073-1006	06-073-1008	06-073-0001	06-073-1022		06-073-1016		06-073-1014	06-073-1026	06-073-1017
$PM_{2.5}$ (non-speciated)	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Designation	O	O	PRI	O	PRI	PRI	QAC	O	O	PRI
	Method	CT (non-FEM)	CT (non-FEM)	SQ (FRM)	CT (non-FEM)	SQ (FRM)	SQ (FRM)	SQ (FRM)	CT (non-FEM)	CT (non-FEM)	SQ (FRM)
	Affiliation	N/A	N/A	N/A	NCore	NCore	N/A	N/A	N/A	N/A	NR
	Spatial Scale	US	US	NS	US	NS	NS	NS	NS	NS	MS
	Site Type	PE	PE	PE	PE	HC	PE	PE	PE	PE	SO
	Objective (Federal)	PI, Research	PI, Research	NAAQS	PI, Research	NAAQS	NAAQS	NAAQS	PI, Research	PI, Research	NAAQS
	Analysis	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
	Frequency	7/24	7/24	1:3	7/24	1:3	1:3	1:6	7/24	7/24	1:3
	Equipment	Met One BAM-1020	Met One BAM-1020	Thermo 2025	Met One BAM-1020	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM
$PM_{2.5}$ (speciated)	Monitor Type				SLAMS	SLAMS					
	Method				SP & SQ	SP & SQ					
	Affiliation				NCORE, CSN, STN	NCORE, CSN, STN					
	Spatial Scale				NS	NS					
	Site Type				PE	PE					
	Objective (Federal)				Research	Research					
	Analysis				EPA	EPA					
	Frequency				1:3	1:3					
	Equipment				URG-3000N	Met One SuperSASS					

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 7.2 $PM_{2.5}$ Manual Minimum Monitoring Requirements

The District is federally mandated to monitor $PM_{2.5}$ levels in accordance with the CFR. This section will state the needs for $PM_{2.5}$ manual method samplers only. The District uses the $PM_{2.5}$ manual sampler to satisfy all minimum monitoring requirements, other than those requirements that specifically state $PM_{2.5}$ continuous sampler. This section will also state the different monitoring requirements for each program, e.g. ambient, manual, NCore, speciated, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other $PM_{2.5}$ network requirements, e.g. ambient $PM_{2.5}$ sampling can fulfill an NCore requirement.

The District meets or exceeds all minimum requirements for $PM_{2.5}$ manual monitoring for all programs except for the following:

- Change in the number of $PM_{2.5}$ FRM SIP samplers, due to relocations.
- Due to multiple relocations, there are DV data gaps. Once all the new stations have been operational for 3 contiguous years (possibly 2024), the designations for the DV location will be revisited for the subsequent ANP.

Section 7.2.1 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Design Criteria (24-Hr. & Annual Average)

The District is required to operate a minimum number of $PM_{2.5}$ samplers irrespective of the $PM_{2.5}$ network affiliation. To ascertain the minimum number of samplers required for ambient air sampling, the Highest Concentration value must be calculated. Table 7-3 – Table 7-5 summarize these requirements.

> *4.7.1(a) Fine Particulate Matter ($PM_{2.5}$) Design Criteria.*[38]
> *…agencies must operate the minimum number of required $PM_{2.5}$ SLAMS sites listed in Table D-5 of this appendix…*

Table D–5 of Appendix D to Part 58—$PM_{2.5}$ Minimum Monitoring Requirements

MSA population (#)	*Most recent 3-year design value ≥85% of any $PM_{2.5}$ NAAQS* (#)	*Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS* (#)
>1,000,000	3	2

Table 7-3 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Design Criteria (Annual Average)

Annual Design Value **2017-2019** (µg/m³)	Annual Design Value Location (name)	Is the Annual Design Value ≥ 85% of the NAAQS? (yes/no)	Is the Annual Design Value < 85% of the NAAQS? (yes/no)	Does the Annual Design Value Meet the NAAQS? (yes/no)
9.3	Lexington (LES) 06-073-1022	NO	yes	yes

[38] (2017) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection 4.7.1 General Requirements (a)

Table 7-4 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Design Criteria (24-Hr)

24-hr Design Value **2017-2019** (µg/m^3)	Annual Design Value Location (name)	Is the 24-hr Design Value ≥ 85% of the NAAQS? (yes/no)	Is the 24-hrl Design Value < 85% of the NAAQS? (yes/no)	Does the 24-hr Design Value Meet the NAAQS? (yes/no)
25	Lexington (LES) 06-073-1022	NO	yes	yes

Table 7-5 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Ambient

MSA & County (name)	Population Estimated from 2010 Census[39] (#)	Number of Required $PM_{2.5}$ Manual Samplers (#)	Number of Active $PM_{2.5}$ Manual Samplers (#)	Number of Needed $PM_{2.5}$ Manual Samplers (#)
San Diego	3.3 Million	3	5	0

Section 7.2.2 $PM_{2.5}$ Manual Minimum Monitoring Requirements-State (SIP)

In 1998, the San Diego Air Pollution Control District, in partnership with the California Air Resources Board (ARB), developed a PM-fine monitoring network to implement the new $PM_{2.5}$ NAAQS and is outlined in the "California Particulate Matter Monitoring Network Description".[40] Table 7-6 summarizes these requirements.

The EPA Region 9 governing authority approved the ARB's statewide distribution plan for the placement of the $PM_{2.5}$ monitors within each district and the location of the collocated monitors for each district to satisfy the sampling and quality assurance requirements of 40 CFR Part 58. Any changes to the $PM_{2.5}$ network in the SDAB will be undertaken in partnership/advisement with ARB. If a $PM_{2.5}$ monitor is violating the NAAQS and the District is forced to relocate the station or the sampler, the District will provide a minimum 30-day period for public review, prior to the relocation of the monitor or the station.

Table 7-6 $PM_{2.5}$ Manual Minimum Monitoring Requirements- State (SIP)

MSA & County (name)	Population Estimated from 2010 Census (#)	Number of $PM_{2.5}$ Manual Samplers Required (non- microscale) (#)	Number of $PM_{2.5}$ Manual Samplers Active (#)	Number of $PM_{2.5}$ Manual Samplers Needed (#)
San Diego	3.3 Million	5	4*	1*

* The Near-road is microscale and cannot be used in this total

[39] Based on the most recent official U.S Census statistics.
[40] http://www.arb.ca.gov/aqd/pm25/pmfdsign.htm

Section 7.2.3 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (24-Hr & Annual Average)

The District is required to designate $PM_{2.5}$ sampling locations for specific purposes or needs. One of these designations is called the site of expected maximum concentrations with respect to the 24-Hr and annual average NAAQS. For the District these locations can change yearly. For both the 24-Hr and annual average NAAQS, these locations routinely alternate between Escondido, Lexington, and Sherman monitoring locations. Table 7-7 summarize these requirements.

> *4.7.1(b)(1)Fine Particulate Matter ($PM_{2.5}$) Design Criteria.*[41]
> *At least one monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration.*

Table 7-7 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (Annual Average) & 24-Hr

Site of Expected Maximum Concentration for Design Value Annual NAAQS (name)		Site of Expected Maximum Concentration for 24-Hr NAAQS (name)
Lexington (LES) 06-073-1022		Lexington (LES) 06-073-1022

Section 7.2.4 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Near-road

The District is required to have a $PM_{2.5}$ sampler at a near-road location. The District is required to operate two near-road sites. The District installed a $PM_{2.5}$ FRM sampler at the first near-road site (RCD), thus fulfilling our near-road particulate requirement. Table 7-8 lists these requirements.

> *4.7.1(b)(2) Fine Particulate Matter ($PM_{2.5}$) Design Criteria.*[42]
> *For CBSAs with a population of 1,000,000 or more persons, at least one $PM_{2.5}$ monitor is to be collocated at a near-road NO_2 station required in section 4.3.2(a) of this appendix.*

Table 7-8 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Near-road

MSA & County (name)	Population Estimated from 2010 Census (#)	Are $PM_{2.5}$ Near-road Samplers Required? (yes/no)	Number of $PM_{2.5}$ Near-road Samplers Required? (#)	Number of $PM_{2.5}$ Near-road Samplers Active (#)	Number of $PM_{2.5}$ Near-road Samplers Needed (#)	Near-road Site Location Name (name)
San Diego	3.3 million	YES	1	1	0	Rancho Carmel Dr. (RCD) 06-073-1017

[41] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection 4.7.1 General Requirements, (b) "Specific Design Criteria for PM2.5, (1)
[42] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection (b)(2)

Section 7.2.5 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Poor Air Quality

The District is required to designate $PM_{2.5}$ sampling locations for specific purposes or needs. One of these designations is called the site of Poor Air Quality with respect to the 24-Hr and annual average NAAQS (Note: the site that serves as fulfilling the requirement for the location of maximum concentration cannot be also be the site of poor air quality). Table 7-9 summarizes these requirements.

> *4.7.1(b)(3) Fine Particulate Matter ($PM_{2.5}$) Design Criteria*[43]
> *For areas with additional required SLAMS, a monitoring station is to be sited in an area of poor air quality.*

Table 7-9 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Site of Poor Air Quality

Site of Poor Air Quality (name)
Sherman (SES) 06-073-1026

Section 7.2.6 $PM_{2.5}$ Manual Minimum Monitoring Requirements-NCore

The District is required to operate a $PM_{2.5}$ sampler as part of the NCore multipollutant monitoring program. This program was designed to measure pollutants at lower levels, as well as other pollutants. For the NCore program, the District is required to collect $PM_{2.5}$ and PM_{coarse} ($PM_{10-2.5}$) data. PM_{coarse} data is obtained by operating collocated PM_{10} and $PM_{2.5}$ samplers of the same make and model and on the same sampling frequency. The $PM_{2.5}$ concentrations are then subtracted from the PM_{10} concentrations to get the PM_{coarse} fraction. Table 7-10 lists the NCore $PM_{2.5}$ requirements.

> *3(b) Design Criteria for NCore Sites*[44]
> *The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass, speciated $PM_{10-2.5}$…*
>
> *4.8.1(a)Coarse Particulate Matter ($PM_{10-2.5}$) Design Criteria.*[45]
> *The only required monitors for $PM_{10-2.5}$ are those required at NCore Stations.*

Table 7-10 $PM_{2.5}$ Manual Minimum Monitoring Requirements-NCore

Number of $PM_{2.5}$ Samplers Required at NCore Sites (#)	Number of $PM_{2.5}$ Samplers Active at NCore Sites (#)	Number of $PM_{2.5}$ Samplers Needed at NCore Sites (#)	Can this $PM_{2.5}$ Sampler be used for PMcoarse? (yes/no)	Number of $PM_{2.5}$ Samplers Needed for PMcoarse? (#)	NCore Site Location Name (name)
1	1	0	yes	0	Lexington (LES) 06-073-1022

[43] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection (b)(3)
[44] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3, "Design Criteria for NCore sites", subpart (b)
[45] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.8 "Coarse Particulate Matter ($PM_{2.5}$) Design Criteria", subsection 4.8.1(a)

Section 7.2.7 $PM_{2.5}$ Manual Minimum Monitoring Requirements- QA Collocation

For quality assurance purposes, there are requirements for analyzers or samplers of the same make and model to be collocated. In 1998, the District and the ARB gave criteria for choosing a site for collocation. Collocation guidance is from the CFR. Table 7-11 summarizes these requirements.

> *3.2.3.1 Collocated Quality Control Sampling Procedures for $PM_{2.5}$*[46]
> *For each distinct monitoring method designation (FRM or FEM) that a PQAO is using for a primary monitor, the PQAO must have 15 percent of the primary monitors of each method designation collocated (values of 0.5 and greater round up)...*

Table 7-11 $PM_{2.5}$ Manual Minimum Monitoring Requirements- QA Collocation

Number of $PM_{2.5}$ Samplers Required from Table D-5 (#)	Number of $PM_{2.5}$ Samplers Active (#)	Number of $PM_{2.5}$ Samplers Needed for Collocation (#)	Number of $PM_{2.5}$ Samplers Active for Collocation (#)	Number of $PM_{2.5}$ Samplers Needed for Collocation (#)	Collocation Site Name (name)
3	5	5 x (15%) = 1	1	0	Kearny Villa Rd (KVR) 06-073-1016

The District meets or exceeds all minimum requirements for $PM_{2.5}$ collocation.

Section 7.2.8 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Summary

Table 7-12summarizes all the $PM_{2.5}$ manual minimum monitoring requirements from Sections 7.2.1-7.2.7.

Table 7-12 $PM_{2.5}$ Manual Minimum Monitoring Requirements-Summary

CFR Programs $PM_{2.5}$ Samplers Requirements (name)	Number of $PM_{2.5}$ Samplers Required (#)	Number of $PM_{2.5}$ Samplers Active (#)	Number of $PM_{2.5}$ Samplers Needed (#)
CFR EPA Table D-2 only=	3	5	0
California Particulate Matter Network (non-microscale)=	5	4	1
DV Maximum Concentration, 24-Hr =	1	1	0
DV Maximum Concentration, Annual Average=	1	1	0
Expected Maximum Concentration, 24-Hr =	1	1	0
Expected Maximum Concentration, Annual Average=	1	1	0
Near-road=	1	1	0
Poor Air Quality=	1	1	0
NCore=	1	1	0
QA Collocation=	1	1	0

[46] (2018) 40 CFR Part 58, Appendix A, Section 3.2.3.1, Quality System Requirements, $PM_{2.5}$, 3.2.3.1

Section 7.3 $PM_{2.5}$ Continuous Minimum Monitoring Requirements

The District is federally mandated to monitor $PM_{2.5}$ levels in accordance with the CFR. This section will state the needs for $PM_{2.5}$ continuous method samplers only and will state the different monitoring requirements for each program, e.g. ambient, NCore, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced).

The District meets or exceeds all minimum requirements for $PM_{2.5}$ continuous monitoring for all programs.

Section 7.3.1 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Ambient

The District is required to operate a minimum number of $PM_{2.5}$ continuous samplers irrespective of the $PM_{2.5}$ network affiliation. Table 7-13 summarizes these requirements.

> *4.7.2 Fine Particulate Matter ($PM_{2.5}$) Design Criteria. Requirement for Continuous $PM_{2.5}$ Monitoring*[47]
> *The State, or where appropriate, local agencies must operate continuous $PM_{2.5}$ analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix.*

Table 7-13 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Ambient

Minimum Number of $PM_{2.5}$ Manual Samplers Required from Table D-5 (#)	Minimum Number of $PM_{2.5}$ Continuous Analyzers Required= ½ Minimum Number of Required $PM_{2.5}$ Manual Samplers Round Up (#)	Number of $PM_{2.5}$ Continuous Analyzers Active (#)	Number of $PM_{2.5}$ Continuous Analyzers Needed (#)
3	3 x (½) = 2	5	0

Section 7.3.2 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation with Manual Sampler

The District is required to operate a minimum number of $PM_{2.5}$ continuous analyzers collocated with $PM_{2.5}$ manual samplers. Table 7-14 summarizes these requirements.

> *4.7.2 Fine Particulate Matter ($PM_{2.5}$) Design Criteria. Requirement for Continuous $PM_{2.5}$ Monitoring*[48]
> *At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors*

Table 7-14 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation with Manual Sampler

Minimum Number of $PM_{2.5}$ Continuous Analyzers Required to be Collocated with $PM_{2.5}$ Manual Samplers (#)	Minimum Number of $PM_{2.5}$ Continuous Analyzers Actively Collocated with $PM_{2.5}$ Manual Samplers (#)	Minimum Number of $PM_{2.5}$ Continuous Analyzers Needed to be Collocated with $PM_{2.5}$ Manual Samplers (#)	Collocation Locations (name)
1	1	0	Lexington (LES) 06-073-1022

[47] (2017) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection 4.7.2

[48] (2017) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection 4.7.2

Section 7.3.3 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-NCore

The District is required to operate a $PM_{2.5}$ continuous sampler as part of the NCore multipollutant monitoring program. Table 7-15 lists the NCore $PM_{2.5}$ continuous requirements.

> *3. Design Criteria for NCore Sites*[49]
> *(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous*

Table 7-15 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-NCore

Number of $PM_{2.5}$ Continuous Analyzers Required at NCore Sites (#)	Number of $PM_{2.5}$ Continuous Analyzers Active at NCore Sites (#)	Number of $PM_{2.5}$ Continuous Analyzers Needed at NCore Sites (#)	NCore Location (name)
1	1	0	Lexington (LES) 06-073-1022

Section 7.3.4 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation

For quality assurance purposes, there are requirements for analyzers or samplers of the same make and model to be collocated. Table 7-16 summarize these requirements.

> *3.2.3.2(b) Collocated Quality Control Sampling Procedures for PM 2.5… monitors selected for collocation must also meet the following requirements:*[50]
> *… Table A-2 of this appendix demonstrates the collocation procedure with a PQAO having one type of primary FRM and multiple primary FEMs.*

Table A-2

#Primary FEMS of a unique method designation	*#Collocated*	*#Collocated with an FRM*	*#Collocated with same method designation*
1-9	*1*	*1*	*0*
10-16	*2*	*1*	*1*

Section 7.3.4.1 $PM_{2.5}$ Continuous Minimum Monitoring Requirements- Collocation with Manual

See Section 7.3.2

Section 7.3.4.2 $PM_{2.5}$ Continuous Minimum Monitoring Requirements- QA Collocation with Continuous

The District does not operate any $PM_{2.5}$ continuous analyzer in FEM mode, so none are designated as a primary analyzer and cannot be used for comparison to the NAAQS. Therefore, technically, there is no requirement for QAC collocation. Table 7-16 summarizes these requirements.

Table 7-16 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Collocation

Number of $PM_{2.5}$ Continuous Samplers Designated as FEM (#)	Number of $PM_{2.5}$ Continuous Samplers Required for Collocation (from Table A-2) (#)	Number of $PM_{2.5}$ Continuous Samplers Needed for Collocation (#)
0	0	0

[49] (2018) 40 CFR Part 58, App. D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3, "Design Criteria for NCore sites", subpart (b)
[50] (2018) 40 CFR Part 58, App. A, Section 3.2.3.1, Quality System Requirements, PM2.5, 3.2.3

Section 7.3.5 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Summary

Table 7-17 summarizes all the $PM_{2.5}$ continuous monitoring requirements from Sections 7.3.1 – 7.3.4.

Table 7-17 $PM_{2.5}$ Continuous Minimum Monitoring Requirements-Summary

CFR Programs $PM_{2.5}$ Continuous Requirements (name)	Number of $PM_{2.5}$ Continuous Required (#)	Number of $PM_{2.5}$ Continuous Active (#)	Number of $PM_{2.5}$ Continuous Needed (#)
Minimum number required=	2	5	0
Minimum number of continuous collocated w/ manual=	1	1	0
NCore=	1	1	0
QA collocation $PM_{2.5}$ continuous with $PM_{2.5}$ continuous	0	0	0

Section 7.4 $PM_{2.5}$ Speciation Minimum Monitoring Requirements

The State is federally mandated to monitor $PM_{2.5}$ speciation in accordance with the CFR. This section will state the needs for $PM_{2.5}$ speciation method instruments.

The District meets or exceeds all minimum requirements for $PM_{2.5}$ State Regional monitoring.

Section 7.4.1 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Ambient

One of the requirements is for the STN & CSN network to maintain the current speciation network as designed by the governing authorities. Table 7-18 lists these requirements.

> *4.7.4 PM $_{2.5}$ Chemical Speciation Site Requirements.*[51]
> *Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the PM $_{2.5}$ Speciation Trends Network*

Table 7-18 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Ambient

Established $PM_{2.5}$ CSN Samplers (Sites) (#)	Established $PM_{2.5}$ STN Samplers (Sites) (#)	Are the $PM_{2.5}$ CSN & STN Monitor (Sites) Active? (yes/no)	Number of $PM_{2.5}$ CSN & STN Monitor (Sites) Needed? (#)
Lexington (LES) 06-073-1022	Lexington (LES) 06-073-1022	Yes	0
Escondido (ESC) 06-073-1002	Escondido (ESC) 06-073-1002	No	1*

*Escondido is temporarily closed for remodeling. Once the construction is completed, sampling will resume.

Section 7.4.2 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-NCore

The District is required to operate $PM_{2.5}$ speciation samplers as part of the NCore multipollutant monitoring program. Table 7-19 lists these requirements.

> *3.(b) Design Criteria for NCore Sites*[52]
> *The NCore sites must measure, at a minimum… speciated $PM_{2.5}$…*

[51] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.7 "Fine Particulate Matter ($PM_{2.5}$) Design Criteria", subsection 4.7.4.
[52] (2018) 40 CFR Part 58, App D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 3, "Design Criteria for NCore Sites", subsection (b).

Table 7-19 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-NCore

Number of NCore Site(s) (#)	Location of NCore Site(s) (name)	Are the Monitors (Sites) Active (yes/no)	Number of Monitors (Sites) Needed (#)
1	Lexington (LES) 06-073-1022	Yes	0

Section 7.4.3 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Summary

Table 7-20 summarizes all the $PM_{2.5}$ speciation minimum monitoring requirements.

Table 7-20 $PM_{2.5}$ Speciation Minimum Monitoring Requirements-Summary

CFR Programs $PM_{2.5}$ Other Requirements (name)	Number of $PM_{2.5}$ Speciation Required (#)	Number of $PM_{2.5}$ Speciation Active (#)	Number of $PM_{2.5}$ Speciation Needed (#)
$PM_{2.5}$ STN and CSN Speciation=	2	1	1*
NCore=	1	1	0

*Escondido is temporarily closed for remodeling. Once the construction is completed, sampling will resume.

Section 7.5 $PM_{2.5}$ Suitability for Comparison to the NAAQS

The CFR requires that certain operating and siting parameters be met for an instrument to be suitable to be compared to the NAAQS. Some $PM_{2.5}$ instrumentation are not compared to the NAAQS. This includes $PM_{2.5}$ speciation samplers, and $PM_{2.5}$ analyzers not operating in regulatory mode (non-FEM BAM $PM_{2.5}$ continuous samplers). All District $PM_{2.5}$ samplers are sited to specified CFR parameters to collect valid data. This section will list those requirements.

Section 7.5.1 $PM_{2.5}$ Manual Suitability for Comparison to the NAAQS

The CFR requires that for $PM_{2.5}$ Manual data to be used in regulatory determinations of compliance with the $PM_{2.5}$ NAAQS, the $PM_{2.5}$ samplers must be sited according to Federal Regulations[53] and the sampling frequency must be in accordance with Federal Regulations.[54] All District $PM_{2.5}$ Manual samplers meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 7-21 summarizes these requirements.

Table 7-21 $PM_{2.5}$ Manual Suitability for Comparison to the NAAQS – Sampling Equipment

Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Particulate Matter ≤ 2.5 µm (manual)	$PM_{2.5}$	88101	µg/m^3 LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM PM2.5 Air Sampler w/VSCC	Gravimetric	545	1:1 or 1:3	RFPS-0717-245

Section 7.5.2 $PM_{2.5}$ Continuous Unsuitability for Comparison to the NAAQS

The CFR requires that for $PM_{2.5}$ FEM data to be used in regulatory determinations of compliance with the $PM_{2.5}$ NAAQS, the $PM_{2.5}$ FEM samplers must operate according to FEM designation requirements. In 2014, the District received approval from the EPA Region IX authorities to operate the $PM_{2.5}$ Continuous samplers in non-FEM mode. The District operates all $PM_{2.5}$ continuous samplers at 36% relative humidity, per the manufacturer's recommendation. Therefore, the $PM_{2.5}$ continuous samplers cannot be compared to the NAAQS. The $PM_{2.5}$ continuous samplers are an important tool to define and develop

[53] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.
[54] (2019) 40 CFR Part 58.12, Subpart B, "Operating Schedules".

abatement strategies to curtail $PM_{2.5}$ pollution. The $PM_{2.5}$ continuous samplers are used for trends analysis and real-time reporting for public information. Table 7-22 summarizes the equipment requirements.

Table 7-22 $PM_{2.5}$ Continuous Unsuitability for Comparison to the NAAQS – Sampling Equipment

Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Particulate Matter ≤ 2.5 µm (continuous)	$PM_{2.5}$	88502	µg/m^3 LC	105	1-Hr	1	Met One BAM 1020 w/VSCC	Beta Attenuation	733	7/24	Not Applicable

Section 7.5.3 $PM_{2.5}$ Speciation Unsuitability for Comparison to the NAAQS

There are no NAAQS for the $PM_{2.5}$ Speciation program. Table 7-23 summarizes the equipment requirements.

Table 7-23 $PM_{2.5}$ Speciation Unsuitability for Comparison to the NAAQS – Sampling Equipment

Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Particulate Matter ≤ 2.5 µm (speciated)	$PM_{2.5}$ CSN	See ARB or EPA	See EPA	See EPA	24-Hr	7	URG-3000N	See EPA	See EPA	1:3 or 1:6	Not Applicable
Particulate Matter ≤ 2.5 µm (speciated)	$PM_{2.5}$ STN	See ARB or EPA	See EPA	See EPA	24-Hr	7	Met One SuperSASS	See EPA	See EPA	1:3 or 1:6	Not Applicable

Section 7.6 $PM_{2.5}$ Manual Operating Schedule

$PM_{2.5}$ Manual samplers must operate on a specified frequency based upon several factors, e.g. maximum concentration, percentage to the NAAQS, etc. This section will list those requirements. Table 7-24 – Table 7-27 summarize these requirements.

> *58.12(d)(1)(i)Operating schedules for manual $PM_{2.5}$ samplers* [55]
> *Manual $PM_{2.5}$ samplers at required SLAMS stations without a collocated continuously operating $PM_{2.5}$ monitor must operate on at least a 1-in-3 day schedule unless a waiver for an alternative schedule has been approved per paragraph (d)(1)(ii) of this section.*
>
> *(ii) For SLAMS $PM_{2.5}$ sites with both manual and continuous $PM_{2.5}$ monitors operating, the monitoring agency may request approval for a reduction to 1-in-6 day $PM_{2.5}$ sampling or for seasonal sampling from the EPA Regional Administrator.*
>
> *(iii) Required SLAMS stations whose measurements determine the 24-hour design value for their area and whose data are within ±5 percent of the level of the 24-hour $PM_{2.5}$ NAAQS must have an FRM or FEM operate on a daily schedule if that area's design value for the annual NAAQS is less than the level of the annual $PM_{2.5}$ standard. A continuously operating FEM or ARM $PM_{2.5}$ monitor satisfies this requirement unless it is identified in the monitoring agency's annual monitoring network plan as not appropriate for comparison to the NAAQS and the EPA Regional Administrator has approved that the data from that monitor may be excluded from comparison to the NAAQS. The daily schedule must be maintained until the referenced design value no longer meets these criteria for 3 consecutive years.*
>
> *(2) Manual $PM_{2.5}$ samplers at NCore stations and required regional background and regional transport sites must operate on at least a 1-in-3 day sampling frequency.*
>
> *(3) Manual $PM_{2.5}$ speciation samplers at STN stations must operate on at least a 1-in-3 day sampling frequency …*

[55] (2018) 40 CFR Part 58.12, Subpart B, "Operating Schedules", (d) For manual $PM_{2.5}$ samplers (1)(i)

Table 7-24 $PM_{2.5}$ Operating Schedule-for All $PM_{2.5}$ Instruments

	Camp Pendleton	Rancho Carmel Dr.	Alpine	Lexington (NCore, PAMS, DV 24-hr)	Kearny Villa Rd.	Donovan	Chula Vista	Sherman
$PM_{2.5}$-manual FRM		1:3		1:1	1:3		1:3	1:3
$PM_{2.5}$-continuous non-FEM	7/24		7/24	7/24		7/24		7/24
$PM_{2.5}$-speciation				1:3				

Note: Historically, the DV alternates between three FRM locations (Downtown, Escondido, and El Cajon). The Downtown and Escondido sites have been temporarily inoperable, due to relocation; therefore, El Cajon (Lexington) is the DV location. Once the new sites have been operational for 3 contiguous calendar years (for DV calculations purposes) this DV location designation will be re-evaluated in the subsequent ANP.

Table 7-25 $PM_{2.5}$ Manual Operating Schedule-for Manual Samplers Collocated with Continuous Samplers (DV-24-hr)

Is the 24-hr DV $PM_{2.5}$ Manual sampler Collocated with $PM_{2.5}$ Continuous Samplers? (yes/no)	Location of 24-hr DV $PM_{2.5}$ Manual sampler Collocated with $PM_{2.5}$ Continuous Samplers (name)	Calculations 24-hr DV (years)	(µg/m³)	Any 24-Hr DV NAAQS Exceedances over the Last 3-years (yes/no)	What is the Required Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications (yes/no)
yes	Lexington (LES) 06-073-1022	2017-2019	19	NO	1.1	1:1	yes
		2016-2018	19	NO			
		2015-2017	18	NO			

Table 7-26 $PM_{2.5}$ Manual Operating Schedule-NCore

Is there a NCore $PM_{2.5}$ Manual Sampler? (yes)	Location of NCore $PM_{2.5}$ Manual Sampler (name)	What is the Minimum EPA Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
yes	Lexington (LES) 06-073-1022	1:3	1:1	yes

Table 7-27 $PM_{2.5}$ Speciation Operating Schedule-NCore

Is there a NCore $PM_{2.5}$ Speciation Sampler? (yes)	Location of NCore $PM_{2.5}$ Speciation Sampler (name)	What is the Minimum EPA Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
yes	Lexington (LES) 06-073-1022	1:3	1:3	yes

Section 7.7 $PM_{2.5}$ Manual Concentrations for San Diego

As with the State, $PM_{2.5}$ concentrations in the San Diego Air Basin have declined over the years. This section will illustrate the different metrics for comparison.

Section 7.7.1 $PM_{2.5}$ Manual Concentrations for San Diego-for the Last 20 Years

Annual average $PM_{2.5}$ FRM concentrations in the County have declined over the years, see Table 7-28. The 98th percentile of 24-Hr $PM_{2.5}$ concentrations showed substantial variability within this period, a reflection of changes in meteorology and the influence of the 2003 and 2007 wildfires. Furthermore, the standard was lowered in 2007, which corresponded to increased incidents of "Days above the Standard". Note: the "Days Above the Standard" row in Table 7-28 reflects the $PM_{2.5}$ standard for that year. Figure 7.2 graphs the SDAB $PM_{2.5}$ trends over the years.

Table 7-28 $PM_{2.5}$ Manual Concentrations for San Diego-for the Last 20 Years (24-Hr), 1999-2019

	1999	2000	2001	2002	2003 *	2004	2005	2006	2007 *	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maximum 24-Hr Concentration (µg/m³)	64.3	66.3	60.0	53.6	239.2	67.3	44.1	63.3	126.2	42.0	65.0	33.3	34.7	70.7	56.3	36.7	33.5	34.4	42.7	41.9	23.8
Days above the National Std	0	2	0	0	2	1	0	1	17	3	3	0	0	2	2	1	0	0	1	1	0

n/a= not applicable *Wildfires in San Diego County

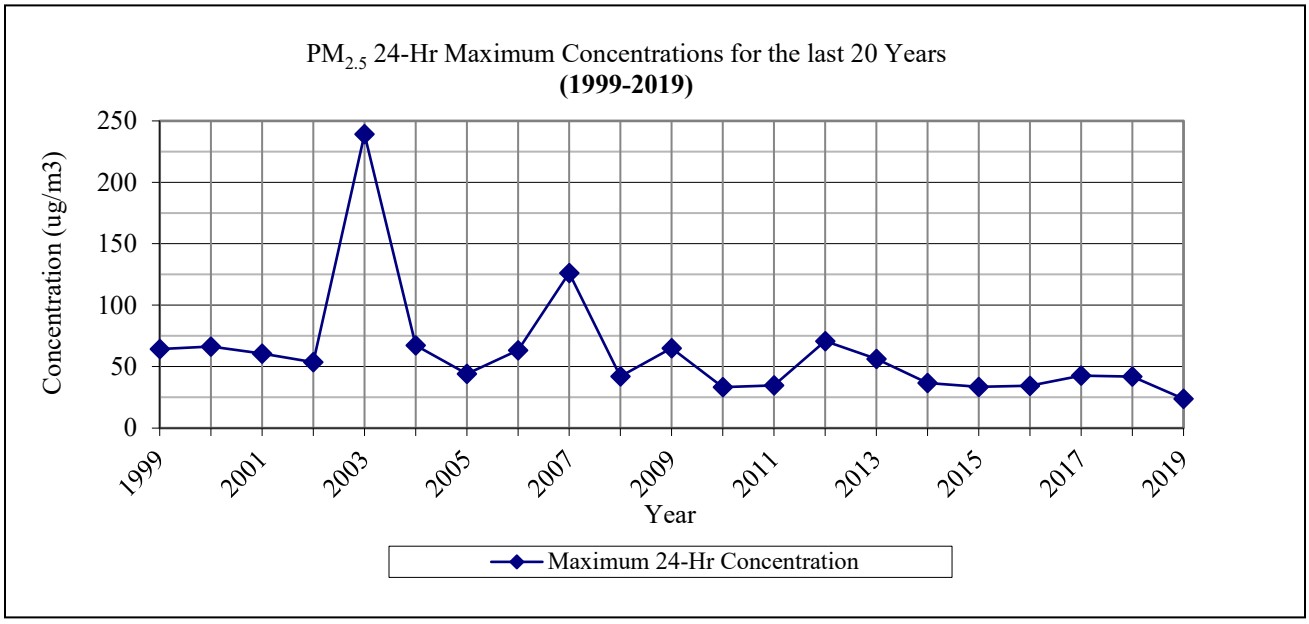


Figure 7.2 PM2.5 Manual Concentrations for San Diego-for the Last 20 Years (24-Hr) Graph

Section 7.7.2 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Year

Table 7-29 lists the maximum $PM_{2.5}$ Manual measurements for each $PM_{2.5}$ Manual method monitoring location and Figure 7.3 shows the values graphically with respect to the National Standard.

FOR INFORMATIONAL PURPOSES ONLY.
NAAQS is for DV calculations. Annual values are not comparable to the NAAQS.

Table 7-29 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2019

	No (#)	Site (name)	Site Abbreviation	Maximum Concentration For 24-Hr (µg/m³)	Annual Average (µg/m³)	Number of Days Above the National Standard (#)
Manual Method	1	Rancho Carmel Dr.	RCD	18.9	8.2	0
	2	Kearny Villa Rd	KVR	16.2	7.0	0
	3	Lexington	LES	23.8	8.6	0
	4	Sherman	SES	N/A	N/A	N/A
	5	Chula Vista	CVA	18.6	8.1	0

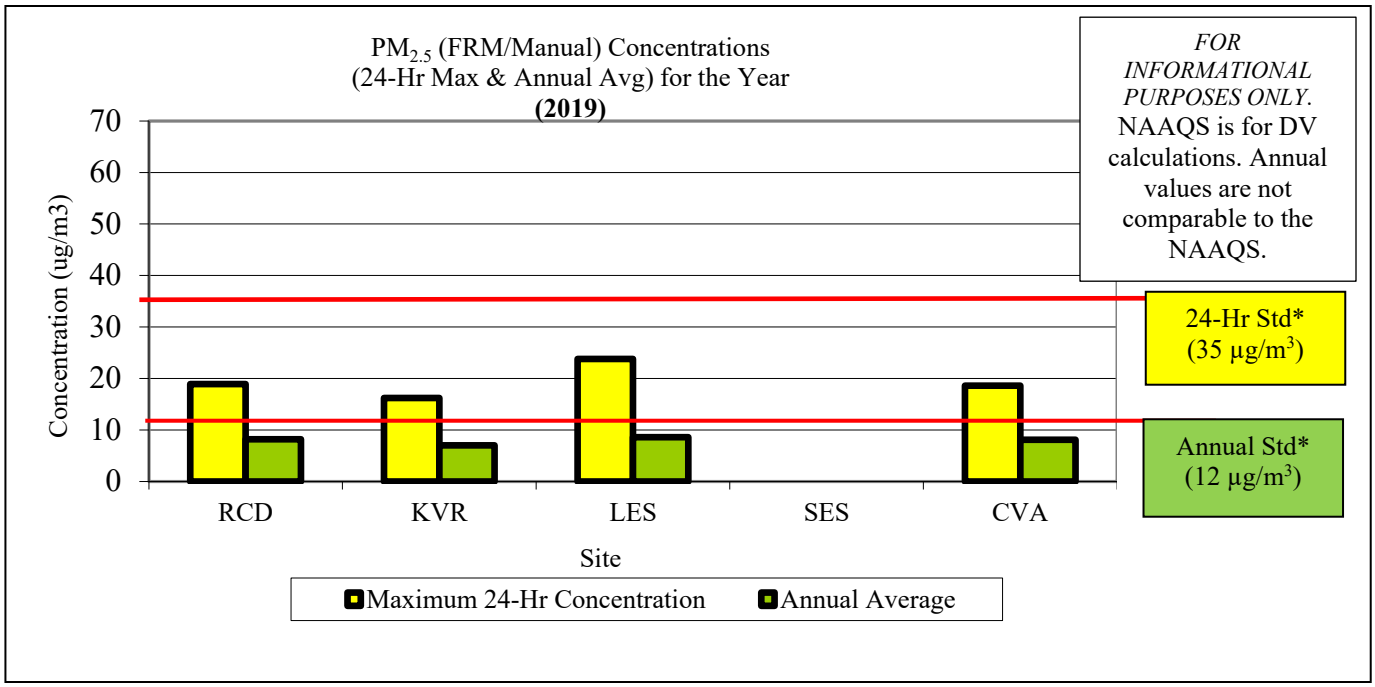


Figure 7.3 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average) Graph

Section 7.7.3 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (24-Hr)

Table 7-30 lists the maximum $PM_{2.5}$ Manual 24-Hr measurements for each $PM_{2.5}$ Manual method monitoring location and Figure 7.4 shows the values graphically with respect to the National Standard.

Table 7-30 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (24-Hr), 2017-2019

Manual Method	No (#)	Site (name)	Site Abbrev	Design Value Maximum Concentration for 24-Hr (µg/m³)	Number of Days Above the 24-Hr NAAQS (#)	Is the 24-Hr Design Value ≥ 85% of the NAAQS? (yes/no)	Is the 24-Hr Design Value < 85% of the NAAQS? (yes/no)	Does the 24-Hr Design Value Meet the NAAQS? (yes/no)
	1	Rancho Carmel Dr*	RCD	16	0	no	yes	yes
	2	Kearny Villa Rd	KVR	18	0	no	yes	yes
	3	Lexington	LES	19	0	no	yes	yes
	4	Sherman*	SES	N/A	N/A	N/A	N/A	N/A
	5	Chula Vista	CVA	25	0	no	yes	yes

*Not sampled for 3-yrs

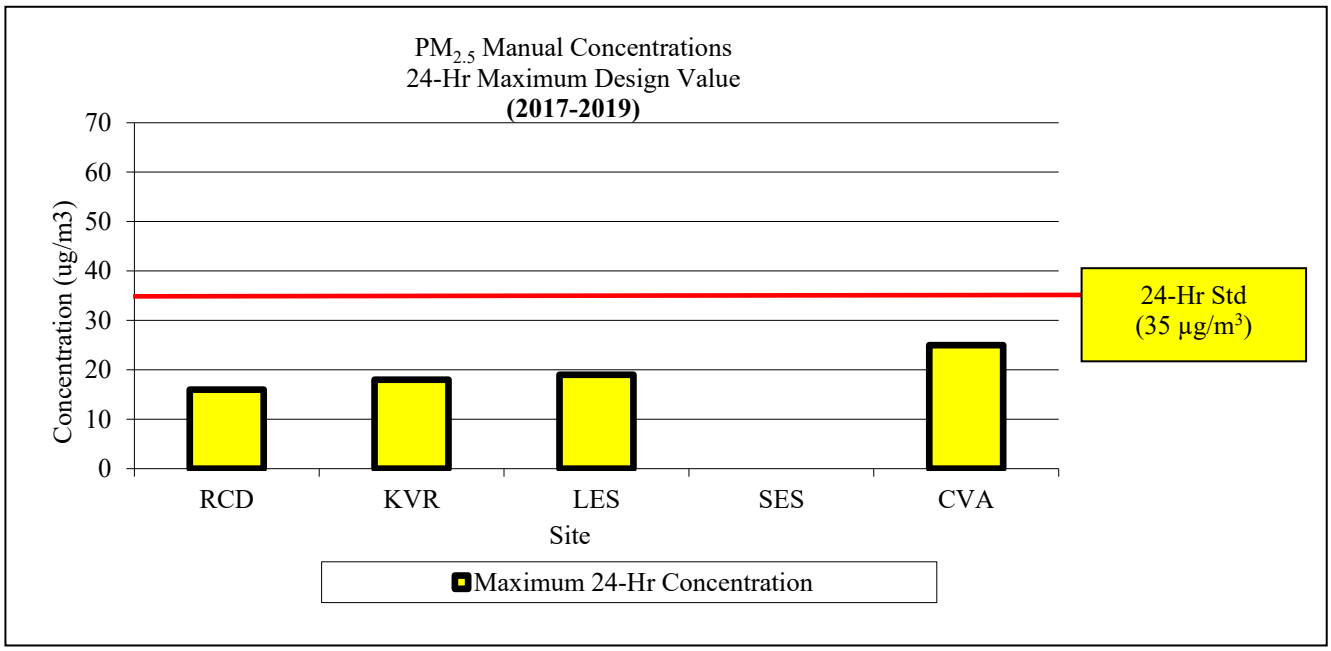


Figure 7.4 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (24-Hr) Graph

Section 7.7.4 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (Annual Average)

Table 7-31 lists the $PM_{2.5}$ Manual annual average Design Value measurements for each $PM_{2.5}$ Manual method monitoring location and Figure 7.5 shows the values graphically with respect to the National Standard.

Table 7-31 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (Annual Average), 2017-2019

	No (#)	Site (name)	Site Abbrev	Design Value for the Annual Avg **2017-2019** (µg/m³)	Number of Days Above the NAAQS **2019** (#)	Is the Annual Avg Design Value ≥ 85% of the NAAQS? **2019** (yes/no)	Is the Annual Avg. Design Value < 85% of the NAAQS? **2019** (yes/no)	Does the Annual Avg Design Value Meet the NAAQS? **2019** (yes/no)
Manual Method	1	Rancho Carmel Dr*	RCD	8.2	0	no	yes	yes
	2	Kearny Villa Rd	KVR	7.8	0	no	yes	yes
	3	Lexington	LES	9.3	0	no	yes	yes
	4	Sherman*	SES	N/A	N/A	N/A	N/A	N/A
	5	Chula Vista	CVA	9.2	0	no	yes	yes

*Not sampled for 3-yrs

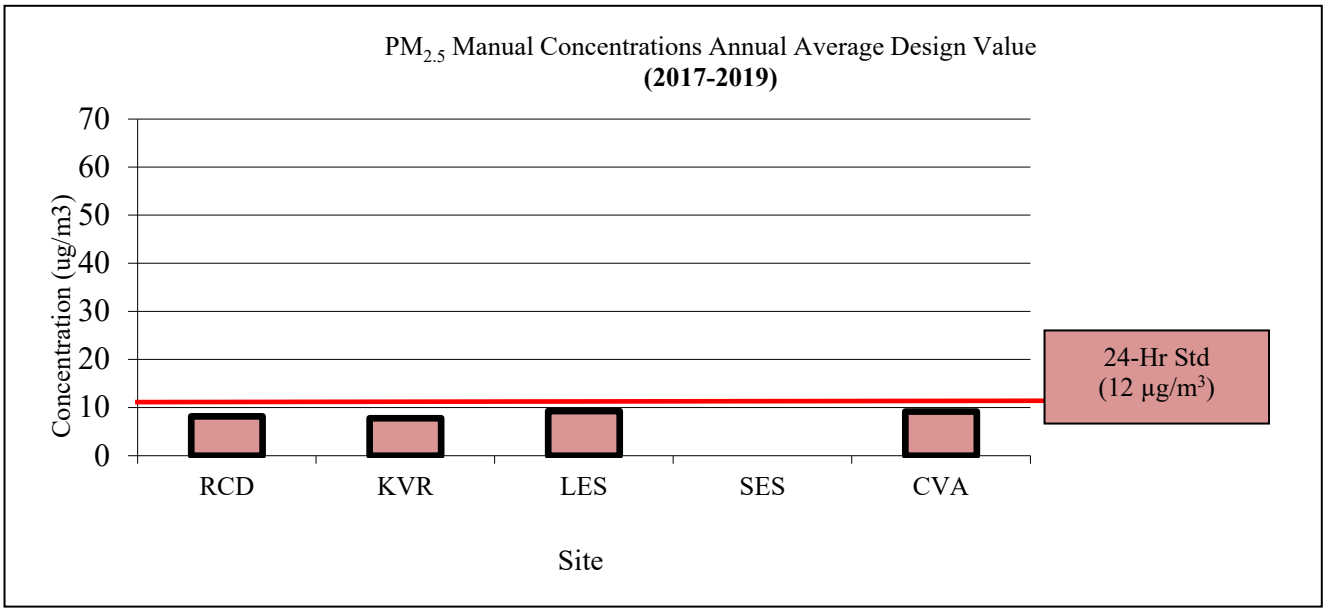


Figure 7.5 $PM_{2.5}$ Manual Concentrations for San Diego-by Site for the Design Value (Annual Average) Graph

Section 7.8 $PM_{2.5}$ Continuous Concentrations for San Diego

All District $PM_{2.5}$ continuous samplers cannot be compared to the NAAQS, because they are non-regulatory units; therefore, the values cannot be compared to the $PM_{2.5}$ standards and can only be used for trends analysis and public informational use. All $PM_{2.5}$ continuous samplers are operated at 36% relative humidity (per manufacturer recommendation), which makes them non-regulatory.

Section 7.8.1 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average)

Table 7-32 lists the maximum $PM_{2.5}$ continuous 24-Hr measurements and Annual Average for each $PM_{2.5}$ continuous monitoring location and Figure 7.6 shows the values graphically. The measurements are not the Design Value (Yearly only).

Note: *FOR INFORMATIONAL PURPOSES ONLY*. Not an FRM/FEM instrument.

Table 7-32 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2019

	No. (#)	Site (name)	Site Abbreviation	Maximum Concentration for 24-Hr (µg/m³)	Annual Average (µg/m³)
Continuous Method	1	Camp Pendleton	CMP	13.8	6.4
	2	Alpine	ALP	13.5	5.3
	3	Lexington	LES	25.7	10.3
	4	Sherman	SES	21.0	10.5
	5	Donovan	DVN	34.3	12.8

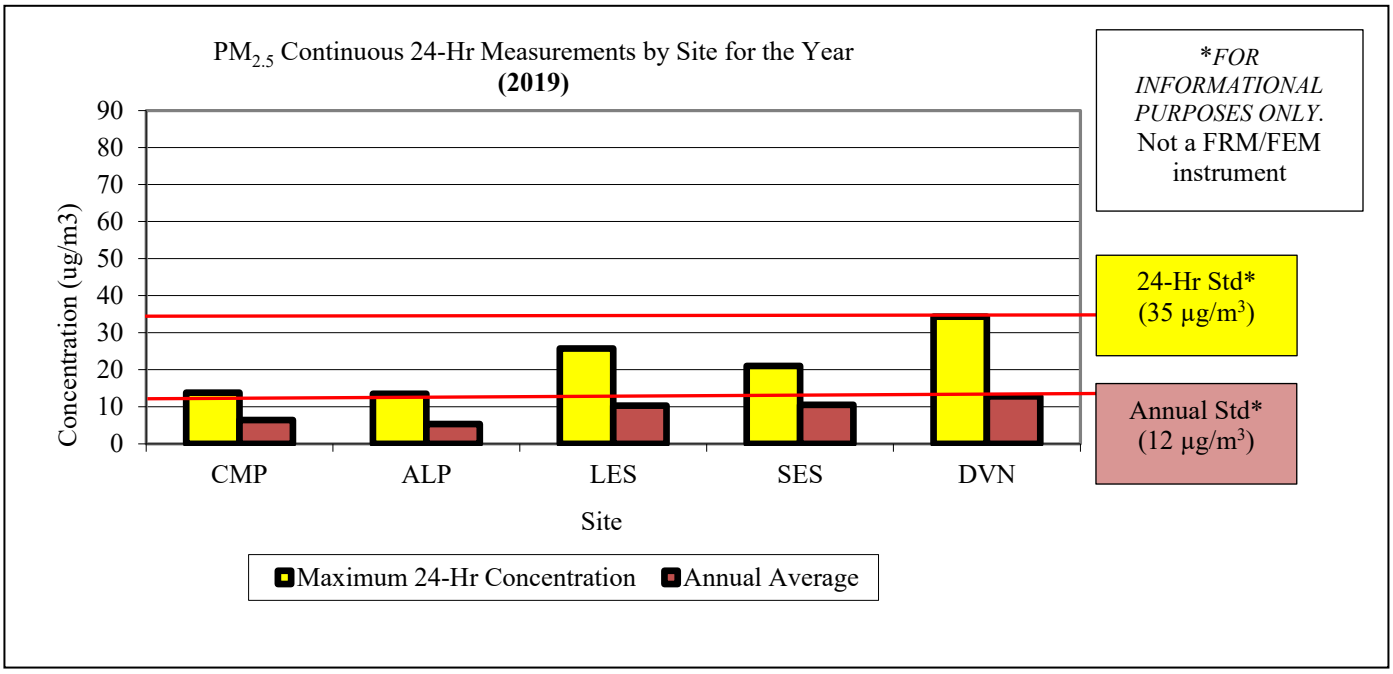


Figure 7.6 $PM_{2.5}$ Continuous Yearly 24-Hr & Annual Average Measurements by Site Graph

Section 7.8.2 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average)

Table 7-33 lists the maximum $PM_{2.5}$ continuous 24-Hr measurements and Annual Average for each $PM_{2.5}$ continuous monitoring location and Figure 7.7 shows the values graphically.

Note: *FOR INFORMATIONAL PURPOSES ONLY*. Not an FRM/FEM instrument.

Table 7-33 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average), 2017-2019

	No. (#)	Site (name)	Site Abbreviation	Design Value Maximum Concentration for 24-Hr (µg/m³)	Design Value Annual Average (µg/m³)
Continuous Method	1	Camp Pendleton	CMP	20	8.8
	2	Alpine	ALP	15	6.6
	3	Lexington	LES	22	10.7
	4	Sherman*	SES	21	10.4
	5	Donovan	DVN	28	12.6

*Not sampled for 3-yrs

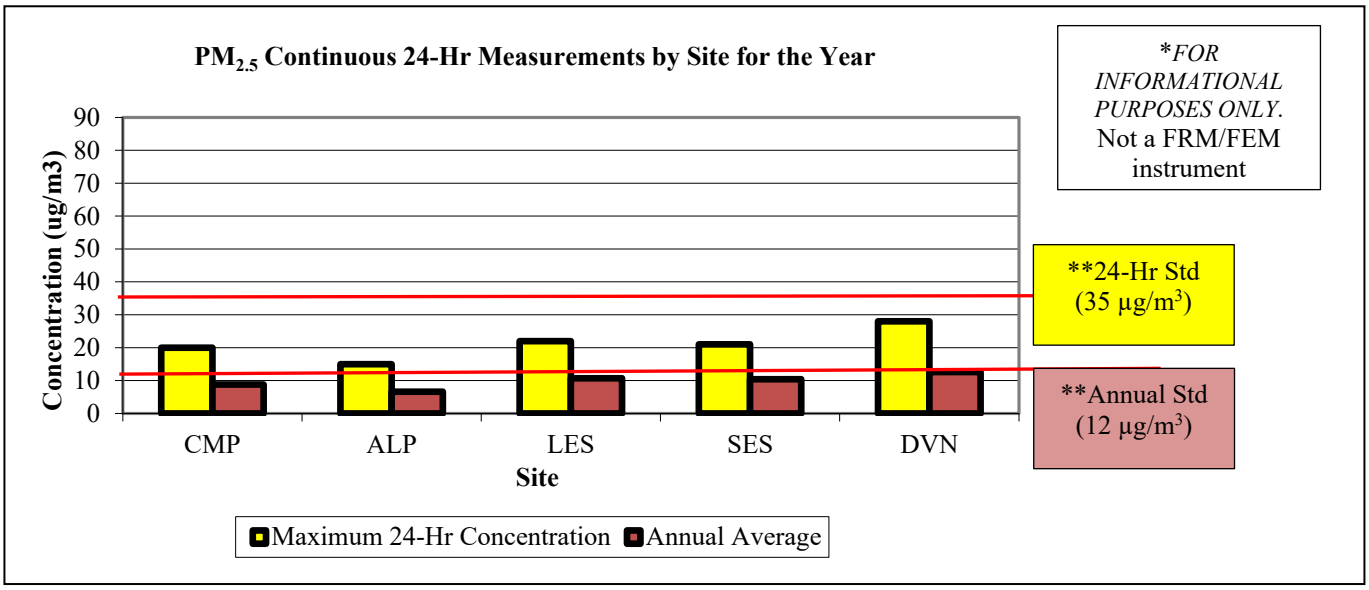


Figure 7.7 $PM_{2.5}$ Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average) Graph

Chapter 8: Particulate Matter 10 µm (PM_{10})

Section 8.1 PM_{10} Introduction

PM_{10} was sampled for at three locations throughout the SDAB (Figure 8.1) and referenced to the PM_{10} standards of the year (Table 8-1). The equipment is listed in Table 8-2. There is a PM_{10} (Lo-Vol) sampler at the Lexington Elementary School (LES) location that is also part of the paired Lo-Vol samplers needed to calculate PMcoarse. Please Note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and are in the process of relocating the station 20 meters southeast of the original location to be on San Diego County property.
- The PM_{10} sampler at KVR was discontinued at the end of 2018.

Figure 8.1 PM_{10} Overall Map

Table 8-1 PM_{10} State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Fine Particulate Matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	Not Applicable	Not Applicable

Table 8-2 PM_{10} Sampling Network

Abbreviation		CVA	DVN		LES
Name		Chula Vista	Donovan		Lexington
AQS ID		06-073-0001	06-073-1014		60-076-1022
PM_{10}	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
	Designation	O	O	QAC	O
	Method	SI	SI	SI	SP
	Affiliation	Not Applicable	Not Applicable	Not Applicable	NCore
	Spatial Scale	NS	NS	NS	NS
	Site Type	PE	HC	PE	PE
	Objective (Federal)	NAAQS	NAAQS	NAAQS	NAAQS
	Frequency	1:6	1:6	1:6	1:6
	Equipment	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Graseby Metal Works body w/ Sierra Anderson 1200 Head	Met One E-SEQ-FRM w/o VSCC

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 8.2 PM_{10} Minimum Monitoring Requirements

The District is federally mandated to monitor PM_{10} levels in accordance with the CFR. This section will state the different monitoring requirements for each program, e.g. ambient, NCore, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other PM_{10} network requirements, e.g. ambient PM_{10} sampler can fulfill an NCore PM_{10} sampler requirement.

The District meets or exceeds all minimum requirements for PM_{10} monitoring for all programs.

Section 8.2.1 PM_{10} Minimum Monitoring Requirements-Ambient

All Districts are required to operate a minimum number of PM_{10} samplers irrespective of the PM_{10} network affiliation. These monitors can serve as fulfilling other PM_{10} network requirements. To ascertain the minimum number of samplers required, the Maximum Concentration value must be calculated and is summarized in Table 8-3 – Table 8-4.

> *4.6(a) Particulate Matter (PM_{10}) Design Criteria.*[56]
> *Table D-4 indicates the approximate number of permanent stations required in MSAs to characterize national and regional PM_{10} air quality trends and geographical patterns…*

Table D-4 of Appendix D to Part 58—PM_{10} Minimum Monitoring Requirements (Approximate Number of Stations per MSA)

Population Category	*High Concentration (120% of NAAQS*[2]	*Medium Concentration (>80% of NAAQS)*	*Low Concentration (<80% of NAAQS)*
>1,000,000	*6-10*	*4-8*	*2-4*

Table 8-3 PM_{10} Minimum Monitoring Requirement-Design Criteria for the Year (24-Hr)

24-hr Maximum Concentration **2019** (µg/m³)	24-hr Maximum Concentration Location (name)	High Concentration Is the 24-hr Maximum Concentration ≥ 120% of the NAAQS? (yes/no)	Medium Concentration Is the 24-hr Maximum Concentration > 80% of the NAAQS? (yes/no)	Low Concentration Is the 24-hr Maximum Concentration < 80% of the NAAQS? (yes/no)	Does the 24-hr Maximum Concentration Meet the NAAQS? (yes/no)
199	DVN	yes	yes	no	no

Table 8-4 PM_{10} Minimum Monitoring Requirements-Ambient

MSA & County (name)	Population Estimated from 2010 Census[57] (#)	Number of PM_{10} Samplers Required (#)	Number of PM_{10} Samplers Active (#)	Number of PM_{10} Samplers Needed (#)
San Diego	3.3 million	2 - 4	4	0

[56] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.6 "Particulate Matter (PM_{10}) Design Criteria" and Table D-4
[57] Based on the most recent official U.S Census statistics.

Section 8.2.2 PM_{10} Minimum Monitoring Requirements-NCore

The District is required to operate a PM_{10} sampler as part of the NCore multipollutant monitoring program for the calculation of $PM_{10-2.5}$ data. Table 8-5 lists the NCore PM_{10} requirements.

> *3(b) Design Criteria for NCore Sites*[58]
> *The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass…*

Table 8-5 PM_{10} Minimum Monitoring Requirements-NCore

Number of PM_{10} Samplers Required for NCore Sites* (#)	Number of PM_{10} Samplers Active at NCore Sites (#)	Number of PM_{10} Samplers Needed at NCore Sites (#)	Name of NCore Site (name)
1	1	0	Lexington (LES) 06-073-1022

*While the PM_{10} sampler is not specifically needed to fulfill NCore requirement, it is needed for $PM_{10-2.5}$ (PMcoarse) measurements.

Section 8.2.3 PM_{10} Manual Minimum Monitoring Requirements-QA Collocation

Collocation guidance is from the CFR. Table 8-6 summarizes these requirements.

> *3.3.4 Collocated Quality Control Sampling Procedures for Manual PM_{10}*[59]
> *…For manual PM_{10} samplers, a PQAO must:(a) Have 15 percent of the primary monitors collocated (values of 0.5 and greater round up)… (b) If an organization has no sites with daily concentrations within plus or minus 20 percent of the NAAQS…(e)*

Table 8-6 PM_{10} Manual Minimum Monitoring Requirements-Collocation

Number of PM_{10} Samplers Required (#)	Number of PM_{10} Samplers Active** (#)	Number of PM_{10} Samplers Required for Collocation (#)	Number of PM_{10} Samplers Active for Collocation (#)	Number of PM_{10} Samplers Needed for Collocation (#)	Location of Collocated Site(s) (name)
2 - 4	3	3 x (15%) = 1	1	0	Donovan (DVN) 06-073-1014

**The NCore PM_{10} sampler is a Lo-Vol sampler, so it is not included in the number of active samplers for collocation.

Section 8.2.4 PM_{10} Minimum Monitoring Requirements-Summary

Table 8-7 summarizes all the PM_{10} minimum monitoring requirements from Sections 8.2.1-8.2.3.

Table 8-7 PM_{10} Minimum Monitoring Requirements-Summary

CFR Programs PM_{10} Samplers Requirements (name)	Number of PM_{10} Samplers Required (#)	Number of PM_{10} Samplers Active (#)	Number of PM_{10} Samplers Needed (#)
CFR EPA Table D-2 only=	2-4	4	0
NCore=	1	1	0
QA collocation	1	1	0

[58] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Sec. 3, "Design Criteria for NCore sites", subpart (b)
[59] (2018) 40 CFR Part 58, Appendix A, Section 3.3.4 (a)-(e), Collocated Quality Control Procedures for Manual PM_{10}.

Section 8.3 PM_{10} Suitability for Comparison to the NAAQS

Many different criteria are required for PM_{10} data to be considered to be suitable for comparison to the NAAQS, e.g. siting, sampling frequency, etc. This section will state those criteria.

Section 8.3.1 PM_{10} Suitability for Comparison to the NAAQS - Equipment & Siting

The CFR requires that for PM_{10} data to be used in regulatory determinations of compliance with the PM_{10} NAAQS, the PM_{10} monitors must be sited according to Federal Regulations[60]. All District PM_{10} samplers meet or exceed all minimum monitoring requirements and can be compared to the NAAQS. Table 8-8 summarizes them.

Table 8-8 PM_{10} Suitability for Comparison to the NAAQS, Equipment & Siting

	Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Ambient	Particulate Matter ≤ 10 µm (Hi-Vol)	PM_{10}	85101 81102	µg/m^3 LC STD	105 001	24-Hr	7	Graseby Metal Works 2000H w/ Sierra Anderson 1200 Head	Gravimetric	063 063	1:6	RFPS-1287-063
NCore	Particulate Matter ≤ 10 µm (Lo-Vol)	PM_{10}	85101 81102	µg/m^3 LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM PM-2.5 Sequential Air Sampler w/o VSCC	Gravimetric	246 246	1:3	RFPS-0717-246

Section 8.3.2 PM_{10} Suitability for Comparison to the NAAQS - Sampling Frequency

The CFR requires that for PM_{10} data to be used in regulatory determinations of compliance with the PM_{10} NAAQS, the PM_{10} monitors' sampling frequency must be in accordance with Federal regulations[61] All District PM_{10} samplers meet or exceed all minimum monitoring requirements for the sampling frequency and can be compared to the NAAQS. Table 8-9 summarizes these requirements.

> *58.12(e) Operating schedules*
> *For PM_{10} samplers, a 24-hour sample must be taken from midnight to midnight (local standard time) to ensure national consistency. The minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with respect to the 24-hour standard as illustrated in Figure 1 below…. The minimum sampling schedule for all other sites in the area remains once every six days.*

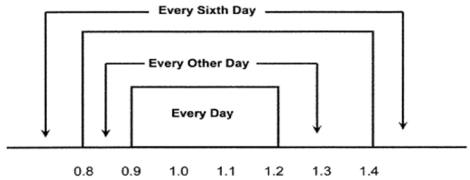


Figure 1 – Ratio to Standard

Table 8-9 PM_{10} Suitability for Comparison to the NAAQS - Sampling Frequency

Site of Expected Maximum Concentration for 24-Hr (name)	Maximum Concentration for 24-Hr (µg/m^3)	Is Site of Expected Maximum Concentration for 24-Hr < 0.8 to the NAAQS (yes/no)	What is the Minimum EPA Permitted Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
Donovan (DVN) 06-073-1014	53	Yes	1:6	1:6	yes

[60] (2018) 40 CFR Part 58, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring" and Table E-4.
[61] (2018) 40 CFR Part 58.12, Subpart B, "Operating Schedules".

Section 8.4 PM_{10} Concentrations for San Diego

PM_{10} concentrations do not correlate well to growth in population or vehicle usage, and high PM_{10} concentrations do not always occur in high population areas. Emissions from stationary sources and motor vehicles form secondary particles that contribute to PM_{10} in many areas. This section will illustrate the different metrics for comparison.

Section 8.4.1 PM_{10} Concentrations for San Diego-for the Last 20 Years

The three-year average of the annual average shows a large decrease; however, there is a great deal of variability from year-to-year. Much of this variability is due to meteorological conditions rather than changes in emissions. Note: the "Days Above the National 24-Hr Standard" row in Table 8-10 and Figure 8.2 reflect the PM_{10} standard for that year.

Table 8-10 PM_{10} Concentrations for San Diego - for the Last 20 Years, 1999-2019

Maximum 24-Hr Concentration (µg/m³)	1999	2000	2001	2002	* 2003	2004	2005	2006	* 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	121	139	107	130	280	137	155	133	394	158	126	108	125	126	90	29	136	79	66	53	199
Days above the National Standard	0	0	0	0	2	0	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0

*Due to the firestorms of 2003 and 2007, the 24-hr standard exceeded the National for those years. The firestorms are considered as exceptional events, and they do not have a lasting impact in the SDAB. Even with the last two firestorms, the County still qualifies for attainment status.

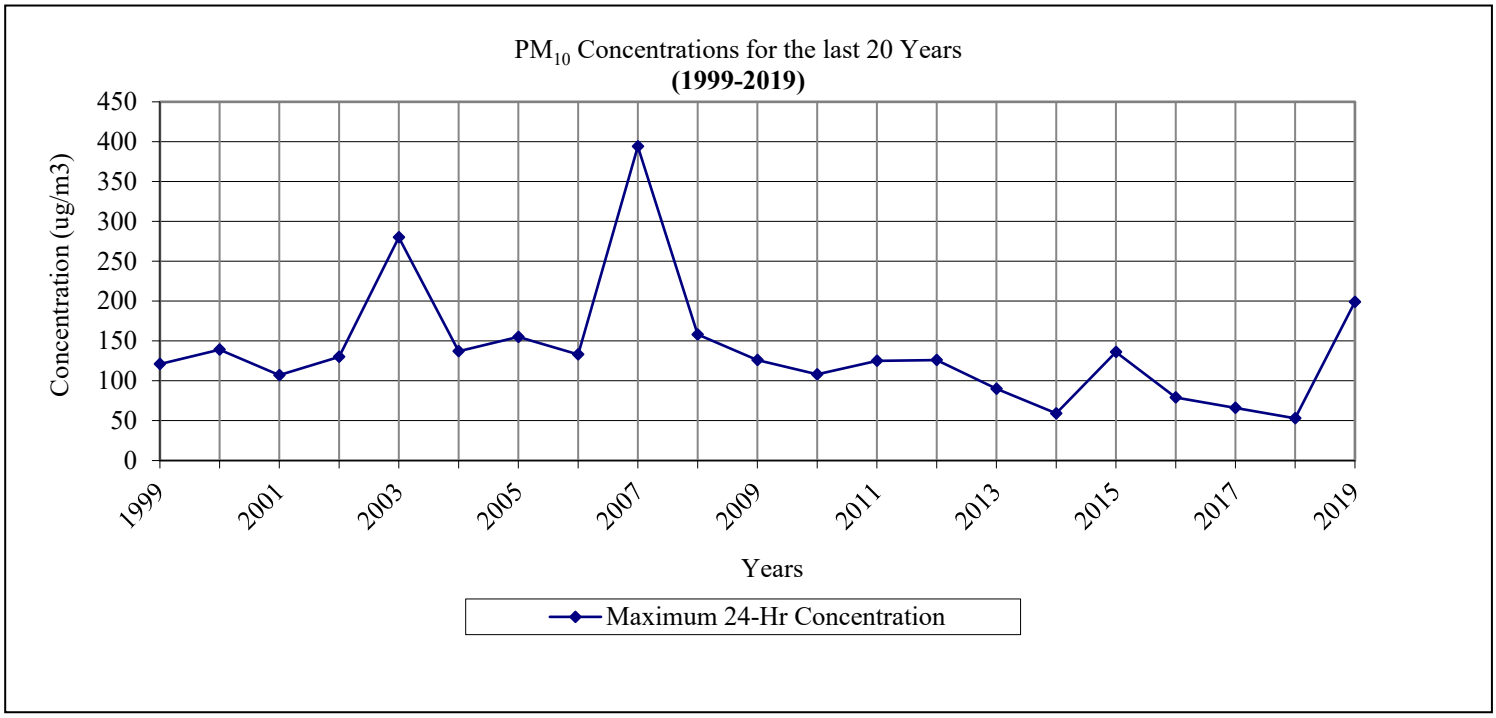


Figure 8.2 PM_{10} Concentrations for San Diego-for the Last 20 Years Graph

Section 8.4.2 PM_{10} Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year (24-Hr & Annual Average)

All data from the PM_{10} samplers are reported in STD conditions, as can be seen in Table 8-11 and Figure 8.3. The PM_{10} (Lo-Vol) sampler presents the data in LC and must be converted to STD conditions.

Table 8-11 PM_{10} Concentrations for San Diego-by Site at Standard Conditions (STD) for the Year, 2019

No. (#)	Site	Site Abbreviation	Maximum Concentration for 24-hrs (µg/m³)	Annual Average (µg/m³)	Number of Days Above the National Standard (#)
1	Lexington	LES	38	19.4	0
2	Chula Vista	CVA	68	19.0	0
3	Donovan	DVN	199	31.6	1

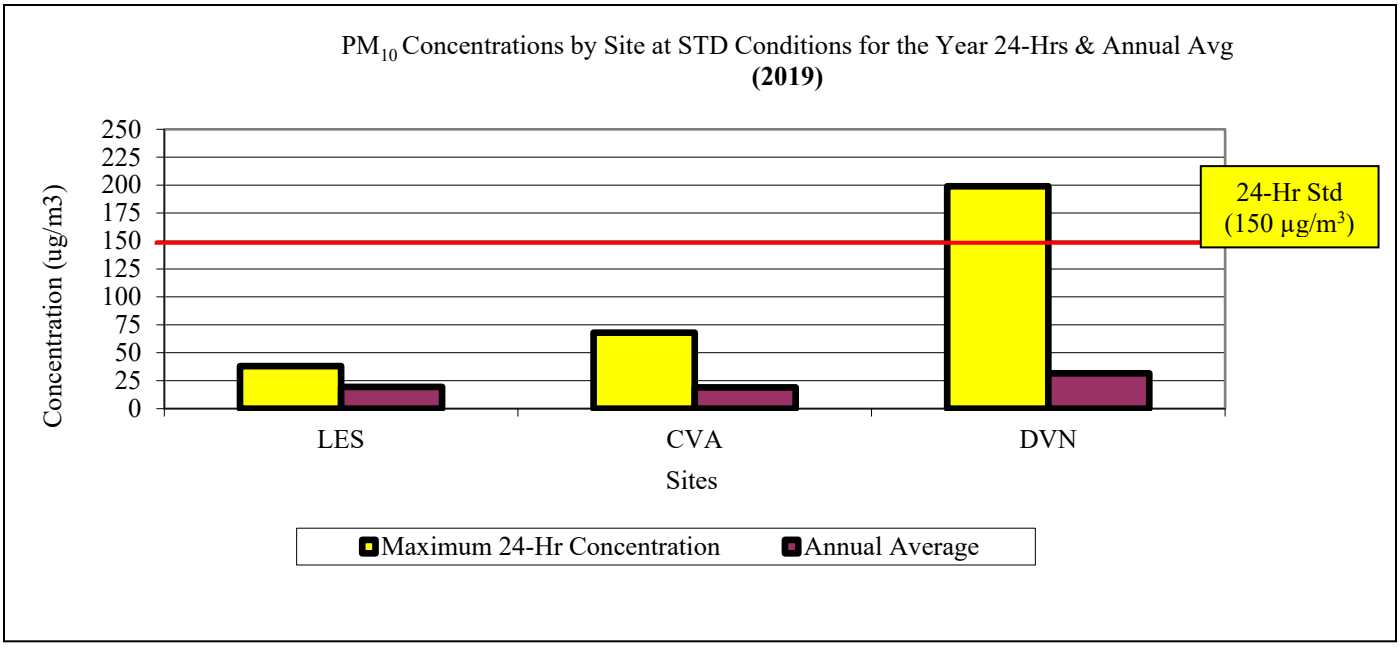


Figure 8.3 PM_{10} Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year

Section 8.4.3 PM_{10} Concentrations for San Diego - by Site at Local Conditions (LC) for the Year (24-Hr & Annual Average)

Table 8-12 and Figure 8.4 illustrate the data in Local Conditions (LC).

Note *FOR INFORMATIONAL PURPOSES ONLY*.
NAAQS is for STD conditions. LC values are not comparable to the NAAQS.

Table 8-12 PM_{10} Concentrations for San Diego - by Site at Local Conditions (LC) for the Year, 2019

No. (#)	Site	Site Abbreviation	Maximum Concentration for 24-hrs (µg/m³)	Annual Average (µg/m³)
1	Lexington	LES	37	18.6
2	Chula Vista	CVA	69	19.3
3	Donovan	DVN	199	31.6

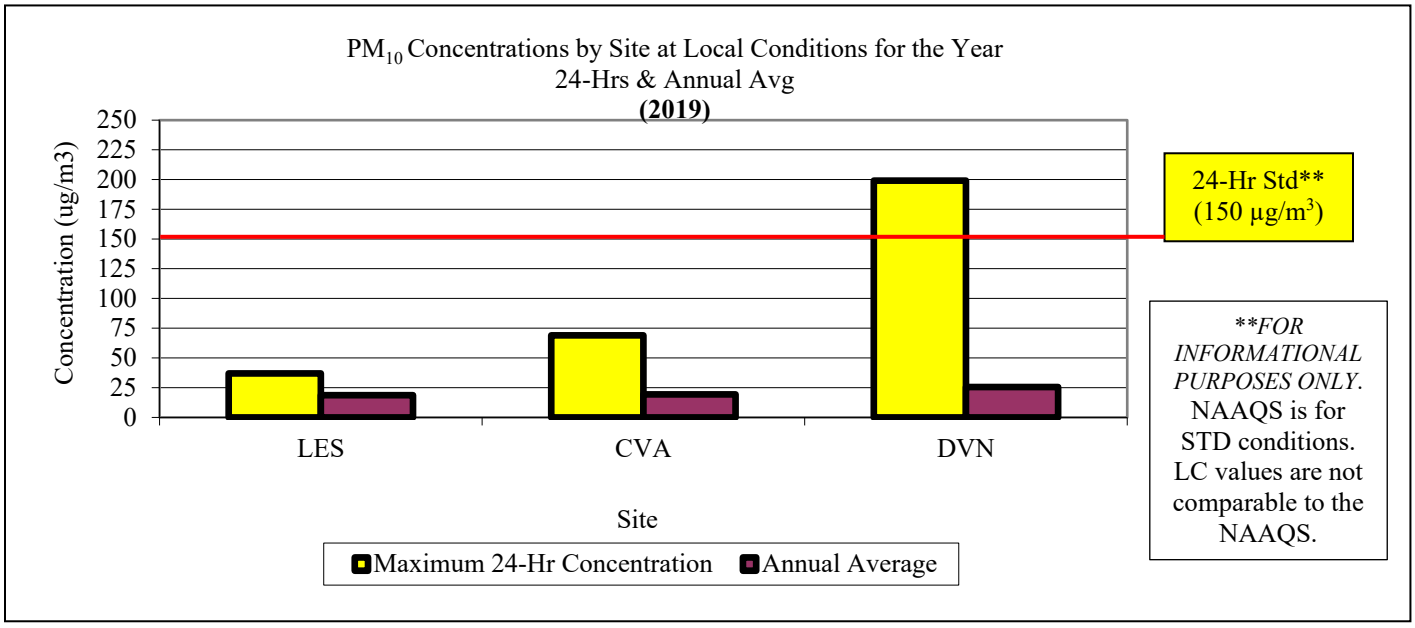


Figure 8.4 PM_{10} Concentrations for San Diego - by Site at Local Conditions (LC) for the Year Graph (24-Hr & Annual Average)

Chapter 9: National Core (NCore)

Section 9.1 NCore Introduction

National Core (NCore) is a multi-pollutant network that integrates several advanced measurement systems for particles, as well as pollutant gases with the existing equipment for a Photochemical Assessment Monitoring Station (PAMS). The EPA designated the El Cajon-Lexington Elementary School (Figure 9.1) as the NCore site for the SDAB, so there is additional instrumentation, including PM_{coarse} (values calculated from paired Low-Volume particulate samplers, by subtracting the measured concentrations from a $PM_{2.5}$ Low Volume sampler from the measured concentrations from a PM_{10} Low Volume sampler, CO (trace level), SO_2 (trace level), and NO_y (Reactive Nitrogen Oxides).

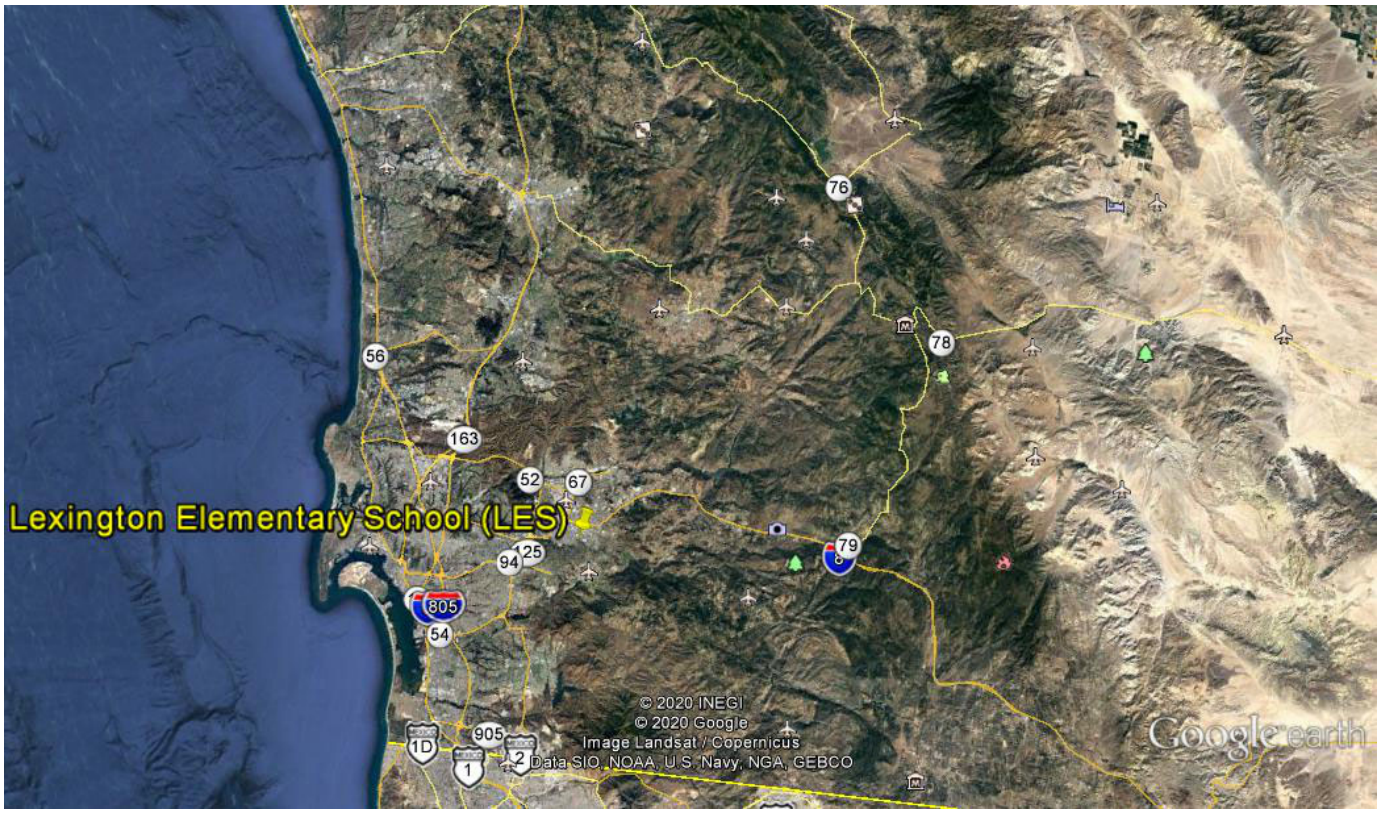


Figure 9.1 NCore Network Map

Section 9.1.1 NCore Minimum Monitoring Requirements

The District is federally mandated to measure multipollutants at lower levels for the NCore program in accordance with the CFR. This section will state the different monitoring requirements for each part of the NCore program (Note: only the passages applicable/informative to the District are referenced).

The District meets or exceeds all minimum requirements for NCore monitoring.

Section 9.1.2 PM_{10} Minimum Monitoring Requirements-Ambient

Several Districts are required to operate instrumentation that is specific to the NCore program. Prior to 2016, participation was based on the population of the CBSA. Now, EPA directives are to maintain existing NCore stations. Table 9-1 summarizes these requirements.

> *3. Design Criteria for NCore Sites*[62]
> *(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass, O_3, SO_2, CO, NO/NO_Y, wind speed, wind direction, relative humidity, and ambient temperature.(1) Although the measurement of NO_y is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NO_y compared to the conventional measurement of NO_X, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NO_y and NO_X measured concentrations, the Administrator may allow for waivers that permit NO_X monitoring to be substituted for the required NO_y monitoring at applicable NCore sites.*

Table 9-1 NCore Minimum Monitoring Requirements-Equipment & Summary

Parameters	Number of Monitors Required (#)	Number of Monitors Active (#)	Number of Monitors Needed (#)
$PM_{2.5}$-Continuous=	1	1	0
$PM_{2.5}$-Manual (Integrated/filter-based)=	1	1	0
$PM_{2.5}$-Speciated=	1	1	0
$PM_{10-2.5}$ (PMcoarse)=	1	1	0
NCore & PAMS O_3=	1	1	0
SO_2-TLE=	1	1	0
CO-TLE=	1	1	0
NCore & PAMS NO/NO_y=	1	1	0
NCore & PAMS Wind speed/Wind direction=	1	1	0
NCore & PAMS % Relative Humidity=	1	1	0
NCore & PAMS Ambient temperature=	1	1	0

*PM_{10}-Manual sampling is not officially required, but $PM_{10-2.5}$ sampling is required. In order obtain $PM_{10-2.5}$ concentrations, $PM_{2.5}$-Manual and PM_{10}-Manual samplers must be run concurrently with the difference between the two to serve as the $PM_{10-2.5}$ concentrations.

[62] (2016) 40 CFR Part 58, Subpart G-Federal Monitoring, Appendix D, Section 3-Design Criteria for NCore sites

Section 9.2 NCore Suitability for Comparison to the NAAQS

Requirements for the sampling frequency of monitors for NCore pollutants are in the 40 CFR Part 58- "Ambient Air Quality Surveillance", Subpart B, Section 58.12 "Operating Schedules" and are shown in Table 9-2.

Table 9-2 NCore Suitability for Comparison to the NAAQS-Frequency & Equipment

Parameter		Code	Unit	Code	Duration	Code	Equipment	Method	Code	Sampling Frequency	Method ID
Ozone	O_3	44201	ppm	007	1-Hr	1	Thermo 49 series	Ultraviolet absorption	047	7/24	EQOA-0880-047
Carbon monoxide Trace Level	CO	42101	ppb	008	1-Hr	1	Thermo 48i-TLE	Nondispersive infrared	554	7/24	RFCA-0981-054
Sulfur dioxide Trace Level	SO_2	42401	ppb	008	1-Hr	1 5-min	Thermo 43i-TLE	Fluorescence	560	7/24	EQSA-0486-060
Lead	Pb	14129	$\mu g/m^3$ LC	105	24-Hr	7	Tisch TE-5170 BLVFC+	ICP/MS Acid filter extract with hot nitric acid	192	1:6	EQL-0710-192
Particulate Matter ≤ 2.5 µm (continuous)	$PM_{2.5}$	88502	$\mu g/m^3$ LC	105	1-Hr	1	Met One BAM 1020 w/VSCC	Beta Attenuation	733	7/24	Not Applicable
Particulate Matter ≤ 2.5 µm (speciated)	$PM_{2.5}$ CSN	See EPA	See EPA	See EPA	24-Hr	7	URG-3000N	See EPA	See EPA	1:3	Not Applicable
Particulate Matter ≤ 2.5 µm (speciated)	$PM_{2.5}$ STN	See EPA	See EPA	See EPA	24-Hr	7	Met One SASS	See EPA	See EPA	1:3	Not Applicable
Particulate Matter ≤ 10 µm (Lo-Vol)	PM_{10}	88501-LC 81102-STD	$\mu g/m^3$ LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM PM-2.5 Sequential Air Sampler w/o VSCC	Gravimetric	246	1:3	RFPS-0717-246
Particulate Matter ≤ 2.5 µm (manual)	$PM_{2.5}$	88101	$\mu g/m^3$ LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM PM-2.5 Sequential Air Sampler w/VSCC	Gravimetric	545	1:1 or 1:3	RFPS-0717-245

Section 9.3 NCore Concentrations

The instrumentation needed for NCore designation are: PM_{coarse} (calculated values from paired PM_{10} & $PM_{2.5}$ Low Volume samplers); CO (trace level); SO_2 (trace level); NO_y (total reactive Nitrogen Oxides). Table 9-3 – Table 9-7 list the data.

Table 9-3 NCore Concentrations for $PM_{10-2.5}$ (PMcoarse)

PMcoarse (µg/m³)*	2016	2017	2018	2019
Max. 24-Hr. Concentration	29.6	30.0	26.2	27.1
98th Percentile of 24-Hr Concentration	26.3	25.1	22.3	23.7
Average of the Quarterly Means	14.0	13.3	13.4	10.8

*Note: PMcoarse (PMc) does not have FRM or FEM designation and cannot be compared to any NAAQS.
FSD and ECA were combined

Table 9-4 NCore Concentrations for CO-TLE

CARBON MONOXIDE (ppm)	2016	2017	2018	2019
Maximum 1-Hr. Concentration	1.7	1.5	1.5	1.3
Maximum 8-Hr. Concentration	1.3	1.4	1.1	1.0

Table 9-5 NCore Concentrations for SO_2-TLE

SULFUR DIOXIDE (ppm)	2016	2017	2018	2019
Maximum 1-Hr SO_2	0.001	0.001	0.003	0.001
Maximum 24-Hr SO_2	0.000	0.000	0.000	0.000
Annual Average SO_2	0.000	0.000	0.000	0.000

Table 9-6 NCore Concentrations for NO_y-NO

NO_y –NO (ppm)**	2016	2017	2018	2019
Maximum 1-Hr. Concentration	**	**	0.049	0.041
Annual Average	**	**	0.009	0.009

**The NO_y sampler was not operational at the temporary NCore site at Floyd Smith Drive.

Table 9-7 NCore Concentrations for NO_2

NO_2 (ppm)**	2016	2017	2018	2019
Maximum 1-Hr. Concentration	0.057	0.044	0.045	0.086
Annual Average	0.009	0.010	0.007	0.014

Chapter 10: Photochemical Assessment Monitoring Stations (PAMS)

Section 10.1 PAMS Introduction

PAMS and PAMS-related sampling will be conducted at Lexington Elementary School in El Cajon (see Figure 10.1). As yet, there are no NAAQS standards to compare the data. The location and equipment are listed in Table 10-1. Please note:

- Per EPA approval, PAMS sampling parameters are suspended and will officially resume upon EPA's direction (anticipated start date of June 1, 2021).

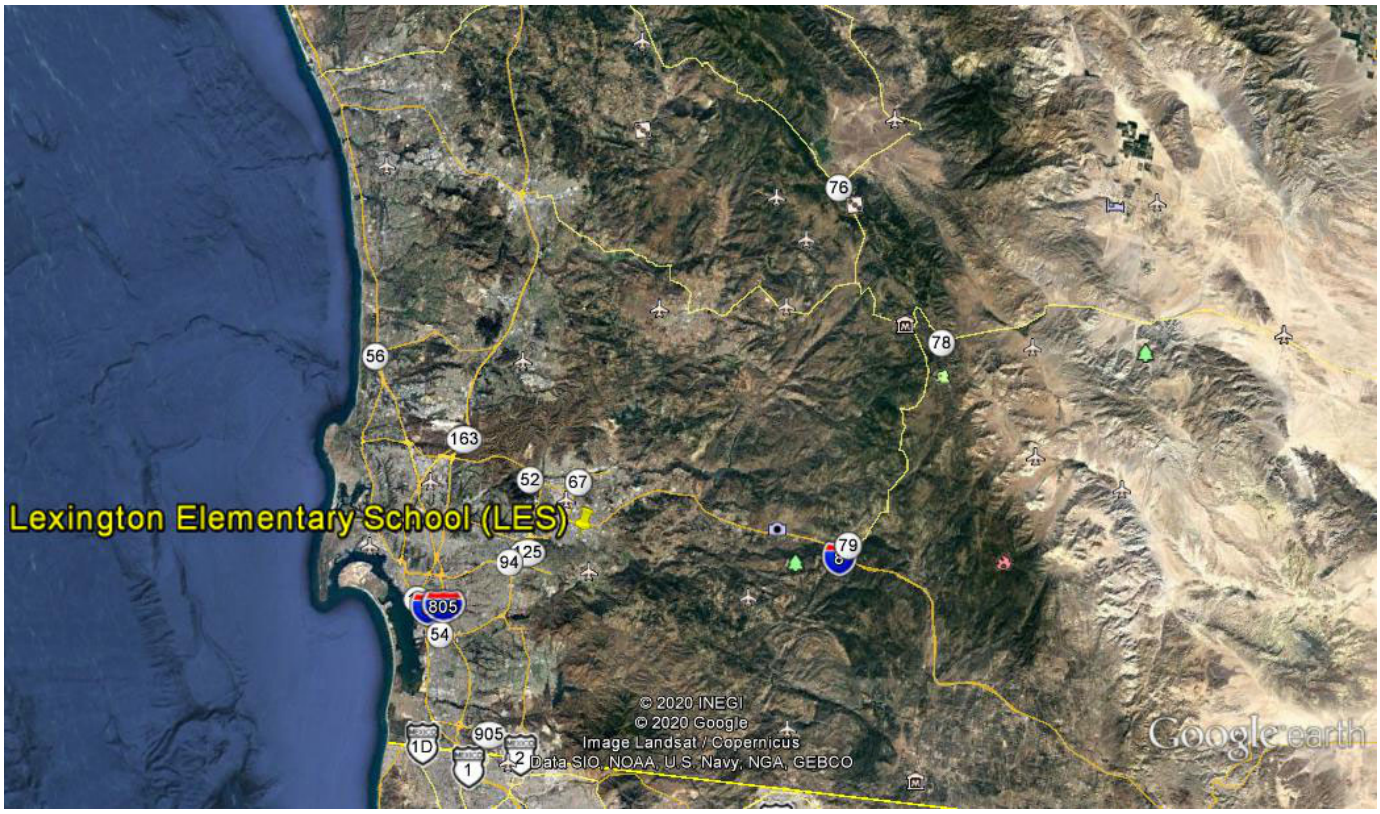


Figure 10.1 PAMS (Carbonyls and VOCs) Network Map

The range of compounds for the PAMS program is in excess of 50 different possible ozone precursors and other compounds (See Table 10-6 and Table 10-7). The toxicity is gauged by risk factors instead of limits.

Table 10-1 PAMS Sampling Network

Abbreviation		LES	
Name		Lexington	
AQS ID		06-073-1022	
PAMS	Monitor Type	SLAMS	SLAMS
	Method	Auto	Cartridges
	Affiliation	PAMS	PAMS
	Spatial Scale	NS	NS
	Site Type	PE	PE
	Objective (Federal)	Research	Research
	Analysis By	APCD	APCD
	Frequency	24/7	1:6
	Equipment	GCFID	Atec 8000

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 10.2 PAMS Minimum Monitoring Requirements

The PAMS program is a multipronged approach to understand, predict, and control ozone concentrations. Ozone is not emitted directly; it is created by the interactions of several different pollutants/emissions, e.g. oxides of nitrogen (NOx), and volatile organic compounds (VOC), some carbonyls, etc. This enhanced monitoring network to track these different emissions has several different monitoring requirements, e.g. laboratory needs, meteorological needs, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). This section will state these requirements. Some of these monitors or samplers can serve as fulfilling other network requirements, e.g. ambient O_3 monitor can fulfill a PAMS O_3 monitoring requirement.

The District meets or exceeds all minimum requirements for PAMS monitoring except for the following:

- PAMS re-engineering implementation has been delayed per EPA. New implementation date unknown at this time. See Executive Summary for waiver.

Section 10.2.1 PAMS Minimum Monitoring Requirements-Equipment

The District is required to operate equipment required for the PAMS parameters for a minimum sampling period. Table 10-2 lists these requirements.

> *5. Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring. (a) State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.(b) PAMS measurements include:*[63]
>
> *(1) Hourly averaged speciated volatile organic compounds (VOCs);*
> *(2) Three 8-hour averaged carbonyl samples per day on a 1 in 3 day schedule, or hourly averaged formaldehyde;*
> *(3) Hourly averaged O_3;*
> *(4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO_2), and total reactive nitrogen (NO_y);*
> *(5) Hourly averaged ambient temperature;*
> *(6) Hourly vector-averaged wind direction;*
> *(7) Hourly vector-averaged wind speed;*
> *(8) Hourly average atmospheric pressure;*
> *(9) Hourly averaged relative humidity;*
> *(10) Hourly precipitation;*
> *(11) Hourly averaged mixing-height;*
> *(12) Hourly averaged solar radiation; and*
> *(13) Hourly averaged ultraviolet radiation.*

[63] (2018) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 5(a) & (b), "Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring Pollutant-Specific Design Criteria for SLAMS Sites"

Table 10-2 PAMS Minimum Sampling Requirements-Equipment & Summary

CFR Programs PAMS Requirements (name)	Equipment Required (#)	Equipment On-hand (#)	Equipment Active (#)	Equipment Needed (#)
Hourly averaged speciated volatile organic compounds (VOCs)=	1	1	1*	0
Three 8-hour averaged carbonyl samples per day on a 1:3=	1	1	1*	0
NCore & PAMS O_3=	1	1	1	0
NO=	1	1	1	0
True-NO_2=	1	0	0*	1
NCore & PAMS NO_y=	1	1	1	0
NCore & PAMS Hourly averaged ambient temperature=	1	1	1	0
NCore & PAMS Hourly vector-averaged wind direction=	1	1	1	0
Hourly average atmospheric pressure=	1	1	1*	0
NCore & PAMS Hourly averaged relative humidity=	1	1	1	0
Hourly precipitation=	1	1	1*	0
Hourly averaged mixing-height=	1	0	0	1
Hourly averaged solar radiation=	1	1	1	0
Hourly averaged ultraviolet radiation=	1	1	1*	0

*Waiting for new EPA implementation timeline

Section 10.2.2 PAMS Minimum Monitoring Requirements-Waivers

The District is required to operate all PAMS equipment at the NCore site. Any deviations require a waiver. Table 10-3 lists the District's waiver need(s).

> *5. Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring (c):*[64]
> *The EPA Regional Administrator may grant a waiver to allow the collection of required PAMS measurements at an alternative location where the monitoring agency can demonstrate that the alternative location will provide representative data useful for regional or national scale modeling and the tracking of trends in O_3 precursors.*

Table 10-3 PAMS Minimum Monitoring Requirements-Waivers

Can the PAMS/NCore Location Accommodate All the Required Equipment? (yes/no)	What Equipment Can/Needs To Be Relocated (name)	Has this been verified by EPA? (yes/no)	Has the District Submitted a Waiver Request? (yes/no)	Has the EPA Approved This Waiver Request? (yes/no/pending)
NO	Ceilometer	Yes EPA R9	Yes in 2017 ANP	Pending

[64] (2017) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 5(c), "Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring Pollutant-Specific Design Criteria for SLAMS Sites"

Section 10.2.3 PAMS Minimum Monitoring Requirements-Sampling Season

The District is required to operate PAMS parameters for a minimum sampling period. This section lists that requirement in Table 10-4.

> *5. Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring (c)*[65]
> *(g) At a minimum, the monitoring agency shall collect the required PAMS measurements during the months of June, July, and August*

Table 10-4 PAMS Minimum Monitoring Requirements-Minimum Sampling Season

Minimum PAMS Monitoring Period (months)	Actual PAMS Monitoring Period (months)	Is the PAMS Monitoring Period Active? (yes/no)
June-August	June-August	NO*

*PAMS sampling has been postponed by the EPA. Start-up time expected June 2021.

Section 10.3 PAMS Sampling Frequency & Equipment

During the non-PAMS season, the auto-GC will not be operational.
The auto-GC will sample every hour (24-hour sampling / daily). During the PAMS season (June to the end of October), the PAMS carbonyls samplers will collect three samples that each have an 8-hour sampling duration. The 8-hour samples are collected on a set time schedule, as follows:

1. 0400 – 1200
2. 1200 – 2000
3. 2000 – 0400

See Table 10-5 for the summary of equipment used and Table 10-6 and Table 10-7 for the parameters.

Table 10-5 PAMS Sampling Equipment

Pollutant	Abbreviation	Samplers	Collection Method	Collection Frequency	Analytical Method	Parameter Code	Method Code
Volatile Organic Compounds	VOC's	n/a	Auto GC	24/7	GC-FID	Table 10.15	n/a
Carbonyl Compounds	n/a	Atec 8000	DNPH cartridges	1:3	HPLC	Table 10.16	202

[65] (2018) 40 CFR Part 58, Appendix D, Section 5, "Network Design for Photochemical Assessment Monitoring Stations (PAMS), Table D-6

Table 10-6 PAMS VOC Parameter Codes

Compound	Parameter
Ethylene	43203
Acetylene	43206
Ethane	43202
Propylene	43205
Propane	43204
Isobutane	43214
1-Butene	43280
n-Butane	43212
trans-2-Butene	43216
cis-2-Butene	43217
Isopentane	43221
1-Pentene	43224
n-Pentane	43220
Isoprene	43243
Trans-2-pentene	43226
cis-2-Pentene	43227
2.2-Dimethylbutane	43244
Cyclopentane	43242
2.3-Dimethylbutane	43284
2-Methylpentane	43285
3-Methylpentane	43230
1-Hexene	43245
n-Hexane	43231
Methylcyclopentane	43262
2.4-Dimethylpentane	43247
Benzene	45201
cyclohexane	43248
2-Methylhexane	43263
2.3-Dimethylpentane	43291
3-Methylhexane	43249

Compound	Parameter
2.2.4-Trimethylpentane	43250
n-Heptane	43232
Methylcyclohexane	43261
2.3.4-Trimethylpentane	43252
Toluene	45202
2-Methylheptane	43960
3-Methylheptane	43253
n-Octane	43233
Ethylbenzene	45203
m-Xylene	45205
p-Xylene	45206
Styrene	45220
o-Xylene	45204
n-Nonane	43235
Isopropylbenzene	45210
α–Pinene	43256
n-Propylbenzene	45209
m-Ethyltoluene	45212
p-Ethyltoluene	45213
1.3.5-Trimethylbenzene	45207
o-Ethyltoluene	45211
β–Pinene	43257
1.2.4-Trimethylbenzene	45208
n-Decane	43238
1.2.3-Trimethylbenzene	45225
m-Diethylbenzene	45218
p-Diethylbenzene	45219
Undecane	43954
Total PAMS	43000
Total NMOC	43102

Table 10-7 PAMS Carbonyls

Compound	Parameter
Formaldehyde	43502
Acetaldehyde	43503
Acetone	43551

Chapter 11: Toxics Program

Section 11.1 Toxics Introduction

Toxics-related sampling was conducted at three sites in the SADB (Figure 11.1 and Table 11-1). As of yet, there are no NAAQS standards which to compare the data. Please note:

- In 2015, the District was evicted from our Escondido (ESC) site (it was on the City of Escondido property) and are in the process of relocating the station 20 meters south east of the original location to be on San Diego County property. Sampling is suspended until the new station is built.

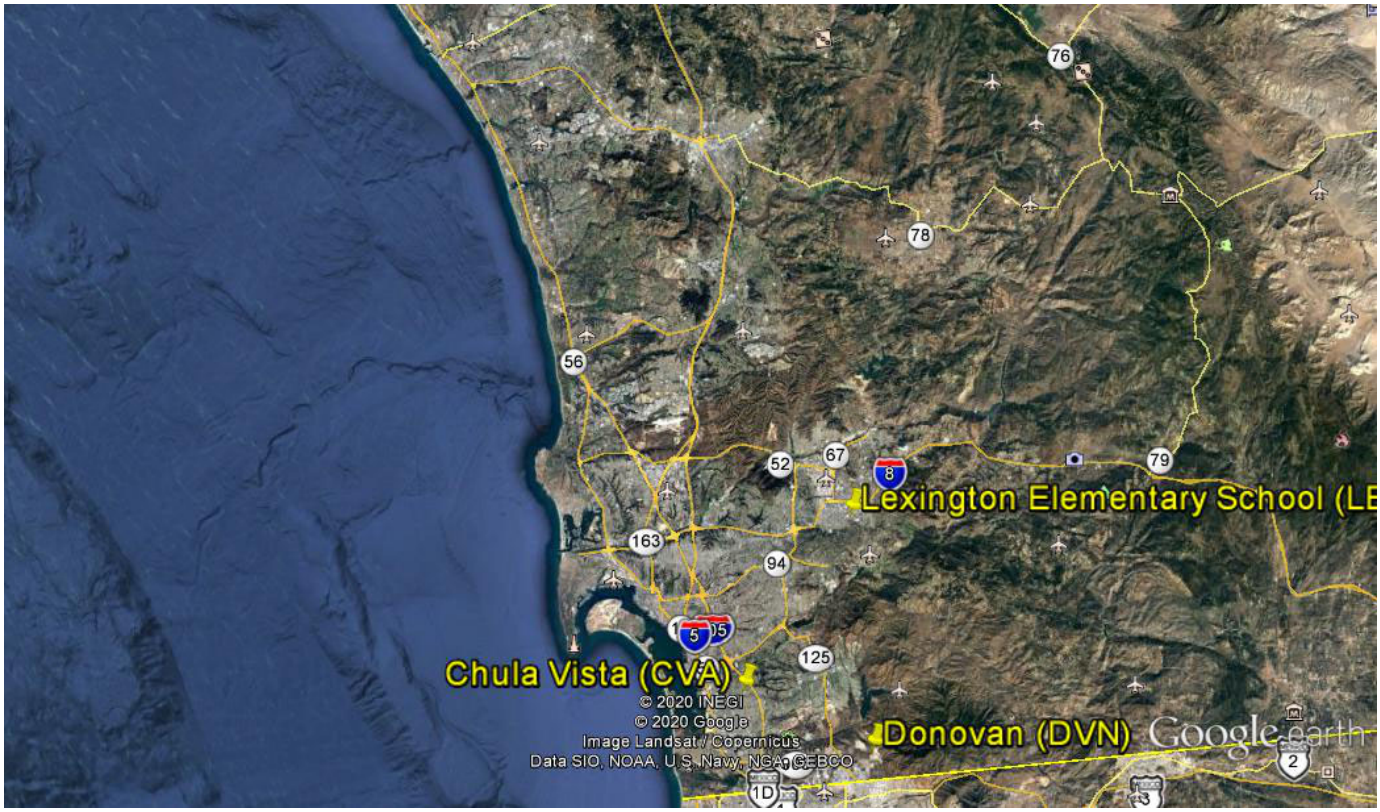


Figure 11.1 Toxics Network Map

The range of defined compounds for the Toxics program is in excess of 100 different possible carcinogenic, irritant, and mutagenic chemicals. Their toxicities are gauged by risk factors rather than limits like there are for the criteria pollutants.

Table 11-1 Toxics Sampling Network

Abbreviation	CVA				LES						DVN		
Name	Chula Vista				Lexington						Donovan		
AQS ID	06-073-0001				06-073-1022						06-073-1014		
Toxics: Pollutant	Toxics-VOCs	Toxics-Metals	Toxics-Cr^{+6}	Toxics-Aldehydes/Carbonyls	Toxics-VOCs	Toxics-Metals	Toxics-Cr^{+6}	Toxics-Aldehydes/Carbonyls	Toxics-Metals	Toxics-Aldehydes/Carbonyls	Toxics-VOCs	Toxics-Metals	Toxics-Aldehydes/Carbonyls
Toxics: Monitor Type	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Toxics: Method	Canister	Filter	Filter	Cartridges	Canister	Filter	Filter	Cartridges	Filter	Cartridges	Canister	Filter	Cartridges
Toxics: Affiliation	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Toxics: Spatial Scale	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	MI	MI	MI
Toxics: Site Type	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	SO	SO	SO
Toxics: Objective (Federal)	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research	Research
Toxics: Analysis By	ARB	ARB	ARB	ARB	ARB	ARB	ARB	ARB	APCD	APCD	APCD	APCD	APCD
Toxics: Frequency	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:6	1:6	1:6	1:6	1:6
Toxics: Equipment	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	Xontech 924	Atec 2000	Xontech 910A FSL	Xontech 924	Atec 8000

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Section 11.2 Toxics Minimum Monitoring Requirements

There are no minimum monitoring requirements for the Toxics program.

Section 11.3 Toxics Sampling Frequency & Equipment Used

The EPA established the minimum collection frequency for VOCs, aldehydes, and other Hazardous Air Pollutants (HAPs) with respect to 24-hour integrated samples and are listed in Table 11-2. The VOC & Carbonyls sampled are in Table 11-3 and Table 11-4, respectively. Table 11-5 lists the Toxics Metals sampled.

Table 11-2 Toxics Equipment

Pollutant	Collection Equipment	Collection Method	Collection Frequency	Analytical Method	Parameter Code	Method Code
Volatile Organic Compounds	Xonteck 910A-FSL (SDAPCD) Xonteck 910/912 (ARB)	Fused Silica Lined (SDAPCD) Summa Canister (ARB)	1:6 (SDAPCD) 1:12 (ARB)	GC-MS	Table 11.3 (SDAPCD) (See ARB)	210
Aldehydes/ Carbonyls	Atec 8000 Xontech 924	DNPH cartridge	1:6 (SDAPCD) 1:12 (ARB)	HPLC	Table 11-4 (SDAPCD) (See ARB)	202 (SDAPCD) (see ARB)
Cr (VI)	XonTech 924	Teflon Filter	1:12 (ARB)	IC	(See ARB)	(See ARB)
Metals	XonTech 924	Teflon Filter	1:6 (SDAPCD) 1:12 (ARB)	ICP-MS (SDAPCD) (See ARB)	Table 11-5 (SDAPCD) (See ARB)	305 (SDAPCD) (See ARB)

Table 11-3 Toxics VOC

Compound	Parameter
Dichlorodifluoromethane	43823
Chloromethane	43801
4-Methyl-2-pentanone (MIBK)	43560
Trichloroethene	43824
Bromomethane	43819
Chloroethane	43812
Trichlorofluoromethane	43811
cis-1,3-Dichloropropene	43831
1,2-Dichloroethane	43815
2-Methyl-1,3-butadiene	43243
1,1-Dichloroethene	43826
Carbon Tetrachloride	43804
Methylene Chloride	43802
Trichlorotrifluoroethane	43207
trans-1,2-Dichloroethene	43838
1,1,2,2-Tetrachloroethane	43818
1,1-Dichloroethane	43813
cis-1,2-Dichloroethene	43839
1,1,1-Trichloroethane	43814
1,2-Dichloropropane	43829
2-Methoxy-2-methylpropane	43372
1,2-Dichloroethane	43815
4-Ethyltoluene	45213

Compound	Parameter
4-Ethyltoluene	45213
1,3,5-Trimethylbenzene	45207
1,2,4-Trimethylbenzene	45208
1,3-Dichlorobenzene	45806
1,4-Dichlorobenzene	45807
1,2-Dichlorobenzene	45805
1,2,4-Trichlorobenzene	45810
Hexachlorobutadiene	43844
Acetonitrile	43702
Vinyl acetate	43447
n-Hexane	43231
Ethyl acetate	43209
Methyl methacrylate	43441
Dichlorotetrafluoroethane	43208
Benzyl chloride	45809
Toluene	45202
1,2-Dibromoethane	43843
trans-1,3-Dichloropropene	43830
Chlorobenzene	45801
Ethylbenzene	45203
m,p-Xylene	45109
Tetrachloroethene	43817
1,1,2-Trichloroethane	43820

Compound	Parameter
1,3-Butadiene	43218
Chloroform	43803
Naphthalene	45850
2-Butanone	43552
Bromoform	43806
Styrene	45220
o-Xylene	45204
Acrylonitrile	43704
Acrolein	43505
Acetone	43551
Benzene	45201
Vinyl Chloride	43860

Table 11-4 Carbonyls

Compound	Parameter
Formaldehyde	43502
Acetaldehyde	43503
Acetone	43551

Table 11-5 Metals

Compound	Parameter
Tier 1	
Beryllium (TSP) STP	12105
Manganese (TSP) STP	12132
Cobalt (TSP) STP	12113
Nickel (TSP) STP	12136
Arsenic (TSP) STP	12103
Selenium (TSP) STP	12154
Cadmium (TSP STP	12110
Antimony (TSP) STP	12102
Lead (TSP) STP	12128
Chromium (TSP) STP	12112
Tier 2*	
Tin (TSP) STP	12160
Vanadium (TSP) STP	12164
Strontium (TSP) STP	12168
Molybdenum (TSP) STP	12134
Barium (TSP) STP	12107

* Analysis of Tier 2 elements started in 2018

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APPENDICES

Appendix A: Site Description Introduction

The appendices list the stations that comprise the San Diego Air Pollution Control District's ambient air quality network (Network) along with specific information required by the EPA for each monitor. This specific information is cross-referenced against the requirements for siting.

Federal requirements for the monitoring objectives and spatial scales, Table A-1, are in the CFR annual update on July 1 of every year, 40 CFR Part 58, Subpart G-Federal Monitoring, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring". Table A-1 summarizes these requirements and Table A-2 defines the terminology and lists the monitor types and the definitions.

Table A-1 Relationship between Site Types and Scales or Representativeness

Site Type	Definition	Appropriate Siting Scales	Permissible Scales & Definitions
Highest concentration,	Site located to determine the highest concentrations expected to occur in the area covered by the network	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Maximum ozone concentrations	Occurring downwind from the area of maximum precursor emissions.	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Maximum precursor impact	Are typically placed near the downwind boundary of the central business district (CBD) or primary area of precursor emissions mix	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Population Exposure	Sites located to determine typical concentrations in areas of high population density	Neighborhood, Urban	Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Source Oriented	Site located to determine the impact of significant sources or source categories on air quality	Micro, Middle, Neighborhood	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers)
General/Background	Sites located to determine general background concentration levels	Urban, Regional	Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Regional transport	Sites located to determine the extent of regional pollutant transport among populated areas and in support of secondary standards.	Urban, Regional	Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Welfare-related impacts	Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare based impacts	Urban, Regional	Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Upwind Background	Sites located to measure overwhelming incoming transport of ozone. Situated in the predominant upwind direction from the maximum precursor emissions location	Neighborhood Urban Regional	Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Quality Assurance	Site located for quality assurance requirements	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)

Table A-2 Summary of Definitions in the Site Description Template

Glossary of Terms

Monitor Type
E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type
HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)
CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
Q= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous

Monitor Designation
PRI= Primary
QAC= Collocated

Network Affiliation
BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale
MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)
NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other

Federal requirements for correctly siting the inlet sample probe(s) are in the 40 CFR Part 58, Subpart G-Federal Monitoring, Appendix E, "Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring".

This specific information is presented in a site description template required by the EPA in all network plans. The pollutant monitors must be assigned a specific scale, type, monitoring objective, and designation. These parameters have specific guidelines that must be followed in order for the data collected from the monitors to be considered valid. Additionally, each monitor must meet certain physical parameters, e.g., distance from each other, distance from the road, distance from obstructions, etc. Table A-3 Summary of Probe Monitoring Pathssummarizes these requirements. Figure A.1 illustrates the distances PM samplers must be from the nearest traffic lane.

Modifications to the Site Template and General Information

The EPA supplies monitoring organizations with a site description template to use for the input of site information in the annual network plan. The District has modified the site description template into two tables. The section of the EPA template that lists the distance from obstructions, collocated monitors, etc., has been moved into a separate table with a more detailed accounting of the requirements provided in Table A-3.

The traffic count is referenced to the closest cross street listed in the current Traffic Count database maintained by the San Diego Association of Governments (SANDAG). At some station locations, the closest cross street with an Annual Average Daily Traffic (AADT) count may be several hundred meters away. The vehicle count is estimated visually (this is stated, when applicable) and the traffic count for the closest major thoroughfare is also reported for comparison purposes. Traffic count data from SANDAG is done in 5-year allotments. All Traffic counts used for this report is from the latest SANDAG report.

Table A-3 Summary of Probe Monitoring Paths

Pollutant (name)	Scale <maximum monitoring path length> (name)	Height from the ground to the probe, inlet or 80% of monitoring path[1] (meters)	Horizontal and vertical distance from supporting structures[2] to probe, inlet, or 90% of monitoring path[1] (meters)	Distance from trees to probe, inlet, or 90% of the monitoring path[1] (meters)	Average daily traffic count (#)	Distance from roadways to probe, inlet, or monitoring path[1,10] (meters)
SO_2[3,4,5,6]	Middle Neighborhood Urban Regional	Min= 2, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15	> 1 > 1 > 1 > 1	> 10 > 10 > 10 > 10	For all scales Not Applicable	For all scales Not Applicable
CO[4,5,7]	Micro Middle Neighborhood	Min= 3.5, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15	> 1 > 1 > 1	> 10 > 10 > 10	For micro scale Not Applicable For all other scales ≤ 10,000 15,000 20,000 30,000 40,000 50,000 ≥ 60,000	For micro scale Min= 2, Max= 10 For all other scales 10 25 45 80 115 135 150
O_3[3,4,5]	Middle Neighborhood Urban Regional	Min= 2, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15	> 1 > 1 > 1 > 1	> 10 > 10 > 10 > 10	For all scales ≥10,000 15,000 20,000 40,000 70,000 ≥ 110,000	For all scales 10 20 30 50 100 250
NOy & NO_2[3,4.5]	Micro Middle Neighborhood Urban, Regional	Min= 2, Max= 7 Min= 2, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15 Min= 2, Max= 15	> 1 > 1 > 1 > 1 > 1	> 10 > 10 > 10 > 10 > 10	For all scales ≥ 10,000 15,000 20,000 40,000 70,000 ≥ 110,000	For all scales 10 20 30 50 100 250
PAMS[3,4,5]	Neighborhood Urban	Min= 2, Max= 15 Min= 2, Max= 15	> 1 > 1	> 10 > 10	For all scales > 10,000 15,000 20,000 40,000 70,000 ≥ 110,000	For all scales 10 20 30 50 100 250
Pb[3,4,5,6,8] PM[3,4,5,6,8,9]	Micro Neighborhood Urban	Min= 2, Max= 7 Min= 2, Max= 15 Min= 2, Max= 15	> 2 > 2 > 2	> 10 > 10 > 10		Min= 5, Max= 15 (street canyon) Min= 2, Max= 10 (street) See Figure E-1 (below)

[1]Monitoring path for open path analyzers is applicable only to middle or neighborhood scale CO monitoring, middle, neighborhood, urban, and regional scale Now monitoring, and all applicable scales for monitoring SO_2, O_3 and O_3 precursors.

[2]When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

[3] Should be > 20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction

[4]Distance from sampler, probe, or 90% of monitoring path to obstacle, such as a building, must be at least twice the height the obstacle protrudes above the sampler, probe, or monitoring path. Sites not meeting this criterion may be classified as middle scale.

[5]Must have unrestricted airflow 270 degrees around the probe or sampler; 180 degrees if the probe is on the side of a building or a wall.

[6]The sampler, probe, or monitoring path should be away from minor source, such as furnace or incineration flues. The separation distance is dependent on the height of the minor source's emission point, the type of waste burned, and the quality of the fuel (sulfur, ash, or lead content). This criterion is designed to avoid undue influences from minor sources.

[7]For microscale CO monitoring sites, the probe must be > 10 meters from a street intersection and preferably at a midblock location

[8] Collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates > 200 liters/min or at least 1 meter apart for samplers having flow rates < 200 liters/min

[9] For particulate sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.

[10] Measured from the edge of the nearest lane to the sampler or inlet.

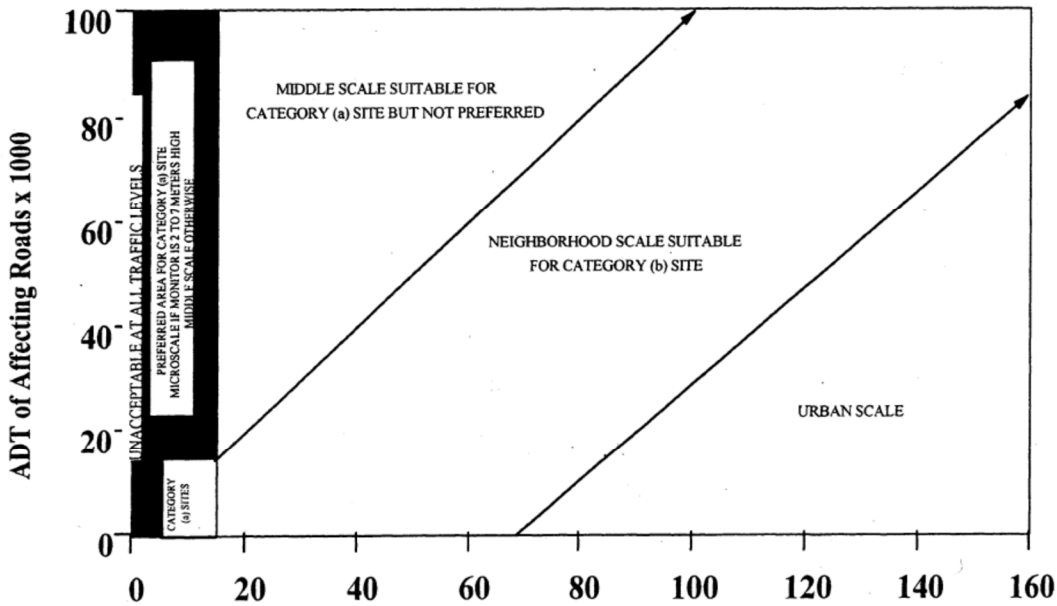

Figure E-1. Distance of PM samplers to nearest traffic lane (meters)

Figure A.1 Distance of PM samplers to nearest traffic lane

Appendix B: Alpine Station Description

Table B-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Alpine
Year Established:	4/29/2015
Site Address:	2300 W. Victoria Dr.
Site Name Abbreviation:	ALP
AQS Number:	06-073-1006
Latitude:	32.842312°
Longitude:	-116.768277°
Elevation above Sea Level:	627 m
General Location:	Trailer adjacent to Padre Reservoir
Ground Cover:	Asphalt
Distance to Road:	17 m west= W. Victoria Drive
Traffic Count (2015 AADT):	W. Victoria Dr. estimated= 500 (no traffic count is available) The closest cross-street with a traffic count is Alpine Blvd. at W. Victoria Dr. (south/slightly upwind 760 m) = 3,300
Site Description:	Due to its geographical location, each year the Alpine station records the highest ozone levels within the air basin. All particulate equipment is on the rooftop of the station.
Monitoring Objectives:	The Alpine location is used to assess downwind transport of fine particulates ($PM_{2.5}$). NO_2 data continues to provide information on trends and are an indication of the relative effectiveness of NO_x regulatory and control measures. The Alpine site also provides information used in making burn/no-burn decisions.
Planned Changes:	*none*

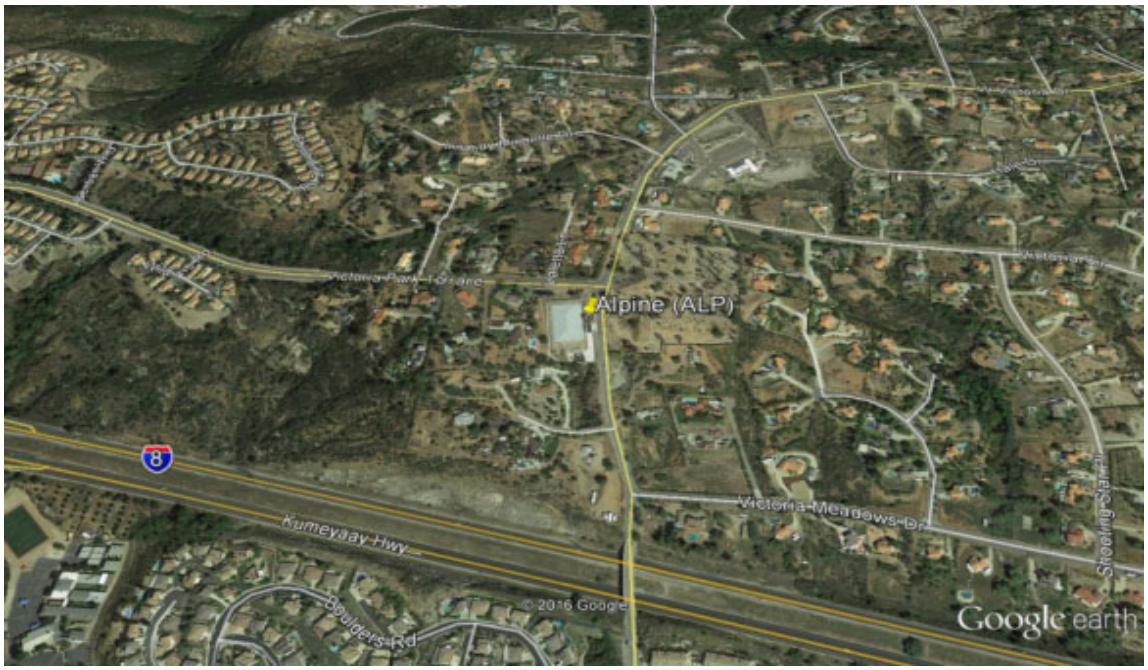

Figure B.1 Alpine – Picture of the Location of the Station

Table B-2 Alpine - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Highest Concentration	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Urban Scale	Urban Scale	N/A	N/A
Monitoring start date	4/29/2015	4/29/2015	4/29/2015	4/29/2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Lo-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
12/2Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	3.28 sec	6.22 sec	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	10/29/19	11/12/19	9/17/19	N/A
NPAP date	*	*	N/A	N/A

*Not done this year

Table B-3 Alpine - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Continuous (non-FEM)**
POC	1
Monitor designation	Other
Parameter code	88502 (LC)
Basic monitoring objective	Public Information, NAAQS
Site type	Population Exposure
Monitor type	SLAMS
Network affiliation	N/A
Instrument manufacturer & model	Met One BAM 1020
Method code	733
FRM/FEM/ARM/Other	Other (non-FEM)
Collecting agency	APCD
Analytical laboratory	APCD
Reporting agency	APCD
Spatial scale	Urban Scale
Monitoring start date	4/29/2015
Current sampling frequency	Continuous
Required sampling frequency	Continuous
Sampling season	Year-round
Any PM Lo-Vol sampler w/in 1m	None
Any PM Hi-Vol sampler w/in 2m	None
Probe material for reactive gases	N/A
Residence time for reactive gases	N/A
Any changes within the next 18 months?	No
Suitable for comparison to the NAAQS?	No
Frequency of flow rate verification	Semi-Monthly
Semi-Annual flow rate audits dates	04/24/19, 11/22/19
Additional QA flow rate check dates**	1/29/19, 7/22/19
NPAP date	*

*Not done this year

**Additional QA checks are not official audits

Table B-4 Alpine - Meteorology Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp	Meteorological Rel. Humidity
POC	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101	62201
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics	Rotronics
Method code	012	050	020	040	012
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Urban	Urban	Urban	Urban	Urban
Monitoring start date	4/29/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	09/19/19	10/29/19	09/18/19	09/18/19	09/18/19
NPAP date	N/A	*	*	*	*

* EPA subcontractor does not have the equipment to audit.

Table B-5 Alpine - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI (40 cfm)	PM_{10}, QAC (40 cfm)	PM_{10} PRI (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a									n/a			n/a						n/a
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI																			
PM_{10}, QAC																			
PM_{10}, PRI																			
$PM_{2.5}$ FRM, PRI																			
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM	n/a									n/a			n/a						n/a
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC	n/a									n/a			n/a						n/a
†PAMS-VOC QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology	n/a									n/a			n/a						n/a
height from ground	7.2									5.0			4.8						7.2
distance: from the road	11.7									11.7			11.7						11.7
from the supporting structure (wood deck)	1.9									2.0			n/a						n/a
from obstructions on roof	N									N			N						N
from obstructions not on roof	N									N			N						N
from the closest tree	38.8									38.8			38.8						38.8
from furnace/flue	N									N			N						N
unrestricted air flow (degrees)	360									360			360						360

n/a= Not Applicable; N= None; †On the side of the station/trailer

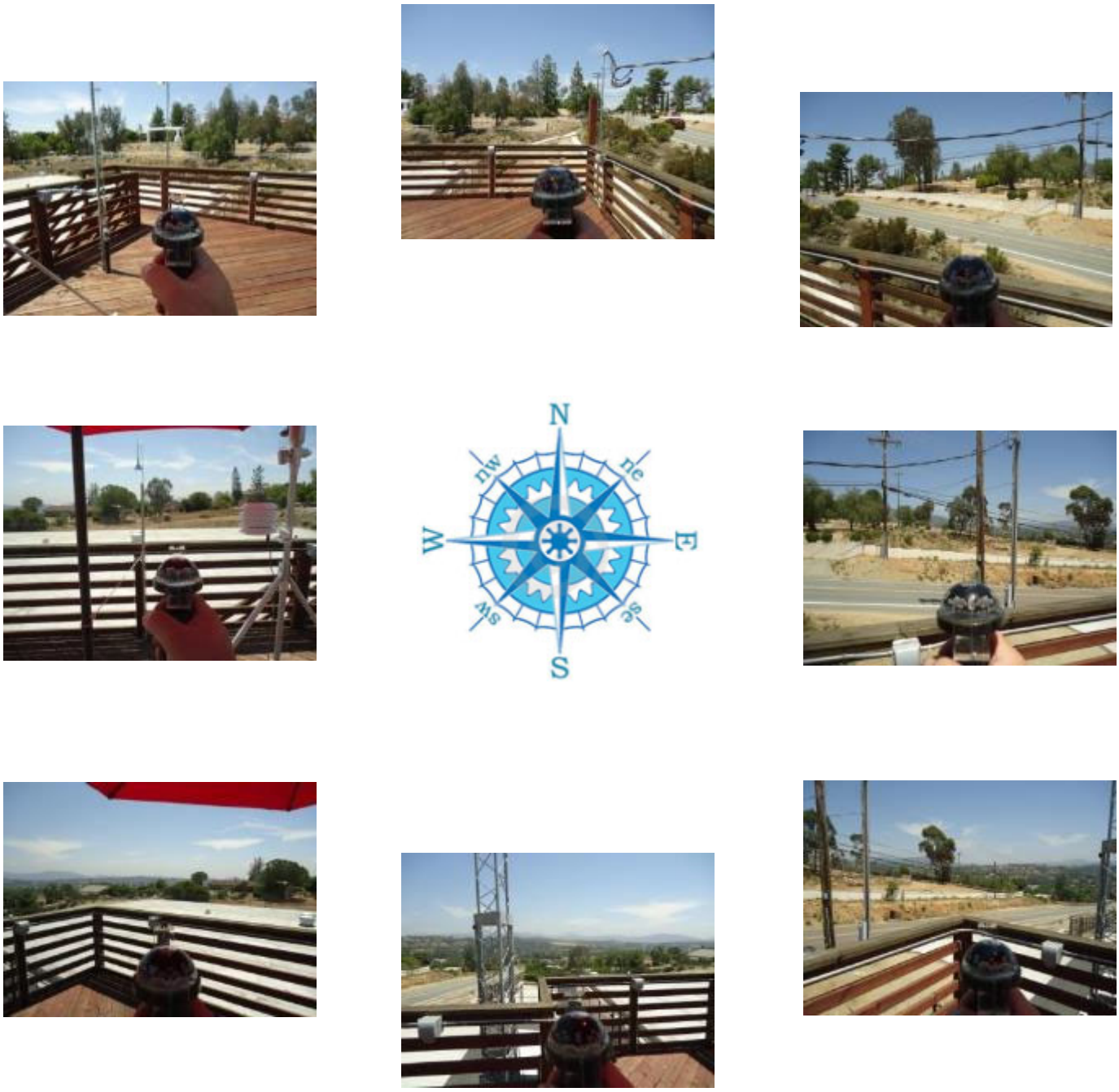

Figure B.2 Alpine – Pictures (Directional) from the Rooftop

Appendix C: Camp Pendleton Station Description

Table C-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Camp Pendleton
Year Established:	4/1997
Site Address:	21441 West B St.
Site Name Abbreviation:	CMP
AQS Number:	06-073-1008
Latitude:	33.217063 ^{O}
Longitude:	-117.396169 ^{O}
Elevation above Sea Level:	16 m
General Location:	Trailer in the W corner of the parking lot across the Corporal Training facility and above the Del Mar beach on Camp Pendleton.
Ground Cover:	Asphalt
Distance to Road:	41 m west= B St.
Traffic Count (2015 AADT):	B St. estimated= 500 (No traffic count is available for the base) The closest area with a traffic count, Interstate 5 (east/downwind 440 m)= 172,000
Site Description:	This station is a trailer located within the Marine Corps Camp Pendleton Base and sits atop a bluff overlooking the Pacific Ocean. In 1997, it replaced the Oceanside station about 7.6 km south east (east of I-5) of the CMP location. Due to its geographical location, this station records over-water transport from the South Coast Air Basin. Diesel truck motor pool 61 m west of the stations and at the base of the bluffs.
Monitoring Objectives:	This site functions as an upwind, PAMS Type I background characterization site.
Planned Changes:	*Not within the next 18-mon, but due to structures and heavy machinery (motor pool) encroaching on the station, as well as frequent power outages, this station will need to be relocated at some point. Once a suitable replacement location has been secured, the District will work with EPA to formalize the relocation process.* *PAMS-VOCs (C2-C6 compounds) & Toxics-VOCs to be added (after the station move)*

Figure C.1 Camp Pendleton – Picture of the Location of the Station

Table C-2 Camp Pendleton - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Not Applicable	Not Applicable
Monitoring start date	1997	1997	4/29/2015	4/29/2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year round	Year round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	8.96 sec	14.93 sec	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	02/08/19	02/11/19	08/02/19	N/A
NPAP date	*	*	N/A	N/A

*Not done this year

Table C-3 Camp Pendleton - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Continuous (non-FEM)**
POC	1
Monitor designation	Other
Parameter code	88502 (LC)
Basic monitoring objective	Public Information, Research
Site type	N/A
Monitor type	O
Network affiliation	N/A
Instrument manufacturer & model	Met One BAM 1020
Method code	733
FRM/FEM/ARM/Other	Other (non-FEM)
Collecting agency	APCD
Analytical laboratory	APCD
Reporting agency	APCD
Spatial scale	Urban
Monitoring start date	10/24/2005
Current sampling frequency	Continuous
Required sampling frequency	Continuous
Sampling season	Year-round
Any PM Lo-Vol sampler w/in 1m	None
Any PM Hi-Vol sampler w/in 2m	None
Probe material for reactive gases	N/A
Residence time for reactive gases	N/A
Any changes within the next 18 months?	No
Suitable for comparison to the NAAQS?	No
Frequency of flow rate verification	Semi-monthly
Semi-Annual flow rate audits dates	02/26/19, 08/14/19
Additional QA flow rate check dates**	6/7/19, 11/25/19, 12/17/19
NPAP date	*

*Not done this year
**Additional QA checks are not official audits

Table C-4 Camp Pendleton - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics
Method code	012	050	020	040
FRM/FEM/ARM/Other	O	O	O	O
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	1997	1997	1997	1997
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	08/14/19	08/01/19	08/01/19	08/14/19
NPAP date	N/A	*	*	*

*EPA subcontractor does not have the equipment to audit.

Table C-4 Camp Pendleton - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI (40 cfm)	PM_{10}, QAC (40 cfm)	PM_{10} PRI (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a									n/a			n/a						n/a
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI																			
PM_{10}, QAC																			
PM_{10}, PRI																			
$PM_{2.5}$ FRM, PRI																			
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM	n/a									n/a			n/a						n/a
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC	n/a									n/a			n/a						n/a
†PAMS-VOC QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology	n/a									n/a			n/a						n/a
height from ground	5.9									5.0			5.6						10
distance: from the road	41									41			41						41
from the supporting structure (wood deck)	1.9									2.0			n/a						n/a
from obstructions on roof	N									N			N						N
from obstructions not on roof	N									N			N						N
from the closest tree	35									35			35						35
from furnace/flue	N									N			N						N
unrestricted air flow (degrees)	360									360			360						360

n/a= Not Applicable; N= None; †On the side of the station/trailer

Figure C.2 Camp Pendleton – Pictures (Directional) from the Rooftop

Appendix D: Chula Vista Station Description

Table D-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Chula Vista
Year Established:	01/20/1972
Site Address:	84 East J St.
Site Name Abbreviation:	CVA
AQS Number:	06-073-0001
Latitude:	32.631175^{O}
Longitude:	-117.059115^{O}
Elevation above Sea Level:	55 m
General Location:	Trailer in the W corner of the Chula Vista Elementary School District offices parking lot
Ground Cover:	Asphalt
Distance to Road:	51 m northwest= E. J St.; 301 m south-southeast Hilltop Dr.
Traffic Count (2015 AADT):	Hilltop Dr. at E. J St.= 9,200
Site Description:	This station is a trailer located on the western corner of the Chula Vista Elementary School District Administration property, immediately south of Chula Vista Fire Station No. 2.
Monitoring Objectives:	Helps track trends for an area that has a high rate of asthma.
Planned Changes:	*In 2020/2021, this station and work area will be demolished and reconfigured, respectively. During this phase, there will be no sampling (EPA approved).*

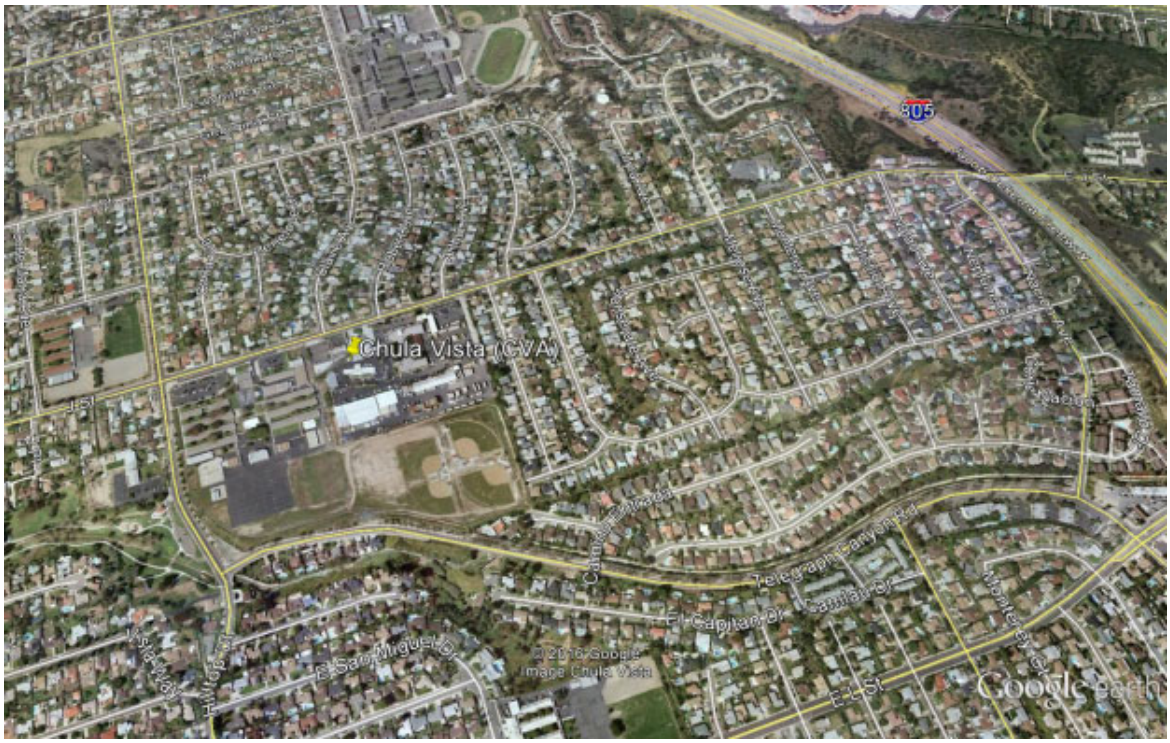

Figure D.1 Chula Vista – Pictures of the Location of the Station

Table D-2 Chula Vista - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	1972	1972	2015	2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	5.24 sec	9.07 sec	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	04/04/19	03/20/19	09/27/19	N/A
NPAP date	8/21/19	8/21/19	N/A	N/A

Table D-3 Chula Vista - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Manual (FRM)**	**PM_{10} Manual**
POC	1	1 (LC) 2 (STD)
Monitor designation	Primary	Primary
Parameter code	88101 (LC)	85101 (LC) 81102 (STD)
Basic monitoring objective	NAAQS	NAAQS
Site type	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Thermo 2025	GMW 2000H w/ SA 1200 Head
Method code	145	063
FRM/FEM/ARM/Other	FRM	FRM
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	1999	1986
Current sampling frequency	1:3	1:6
Required sampling frequency	1:3	1:6
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None
Any PM Hi-Vol sampler w/in 2m	None	None
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	Yes	Yes
Suitable for comparison to the NAAQS?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Semi-Annual flow rate audits dates	03/21/19, 08/29/19	03/21/19, 08/28/19
Additional QA flow rate check dates**	05/02/19, 08/20/19, 11/25/19	N/A
NPAP date	8/21/19	8/21/19
PEP date	3/13/19, 9/18/19	N/A

*Not done this year
**Additional QA checks are not official audits

Table D-4 Chula Vista - Other Pollutants Monitor Designations

Pollutant	Toxics-VOC	Toxics-Metals	Toxics-Cr(VI)	Toxics-Aldehyde
POC	See ARB	See ARB	See ARB	See ARB
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	See ARB	See ARB	See ARB	See ARB
Basic monitoring objective	Research	Research	Research	Research
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	CA Toxics	CA Toxics	CA Toxics	CA Toxics
Network affiliation	CA Toxics	CA Toxics	CA Toxics	CA Toxics
Instrument manufacturer & model	Xontech 910	Xontech 924	Xontech 924	Xontech 924
Method code	See ARB	See ARB	See ARB	See ARB
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	ARB	ARB	ARB	ARB
Reporting agency	ARB	ARB	ARB	ARB
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	1988	1988	1988	1988
Current sampling frequency	1:12	1:12	1:12	1:12
Required sampling frequency	1:6	1:6	1:6	1:6
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	N/A	N/A	N/A	N/A
NPAP date	N/A	8/21	8/21	8/21

Table D-5 Chula Vista - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics
Method code	012	050	020	040
FRM/FEM/ARM/Other	O	O	O	O
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	1972	1972	1972	1998
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	08/28/19	08/30/19	08/30/19	08/30/19
NPAP date	N/A	*	*	*

Note: Deck needs repairs. To be rebuilt in 2020/2021

*EPA subcontractor does not have the equipment to audit.

Table D-6 Chula Vista - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI, Hi-Vol (40 cfm)	PM_{10}, QAC Hi-Vol (40 cfm)	PM_{10} PRI, Lo-Vol (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 cepm)	† PAMS-VOC, QAC	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 cepm)	Toxics-VOC, QAC (50 cepm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a				n/a			n/a								n/a		n/a	n/a
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI, Hi-Vol	n/a				n/a			2.4								4.0		6.2	n/a
PM_{10}, QAC, Hi-Vol	n/a				2.1			2.1								2.2		4.3	n/a
PM_{10}, PRI, Lo-Vol																			
$PM_{2.5}$ FRM, PRI	n/a				2.4			n/a								2.0		4.0	n/a
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM																			
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC	n/a				4.0			2.0								n/a		2.2	n/a
Toxics-VOC, QAC																			
Toxics-Metals	n/a				6.2			4.0								2.2		n/a	n/a
Meteorology	n/a				n/a			n/a								n/a		n/a	n/a
height from ground	6.5				5.1			5.6								5.5		5.7	10
distance: from the road	51				51			51								51		51	51
from the supporting structure (wood deck)	2.0				1.8			2.0								n/a		2.0	n/a
from obstructions on roof	N				N			N								N		N	N
from obstructions not on roof	N				N			N								N		N	N
from the closest tree	N				N			N								N		N	N
from furnace/flue	N				N			N								N		N	N
unrestricted air flow (degrees)	360				360			360								360		360	360

n/a= Not Applicable; N= None; †On the side of the station/trailer

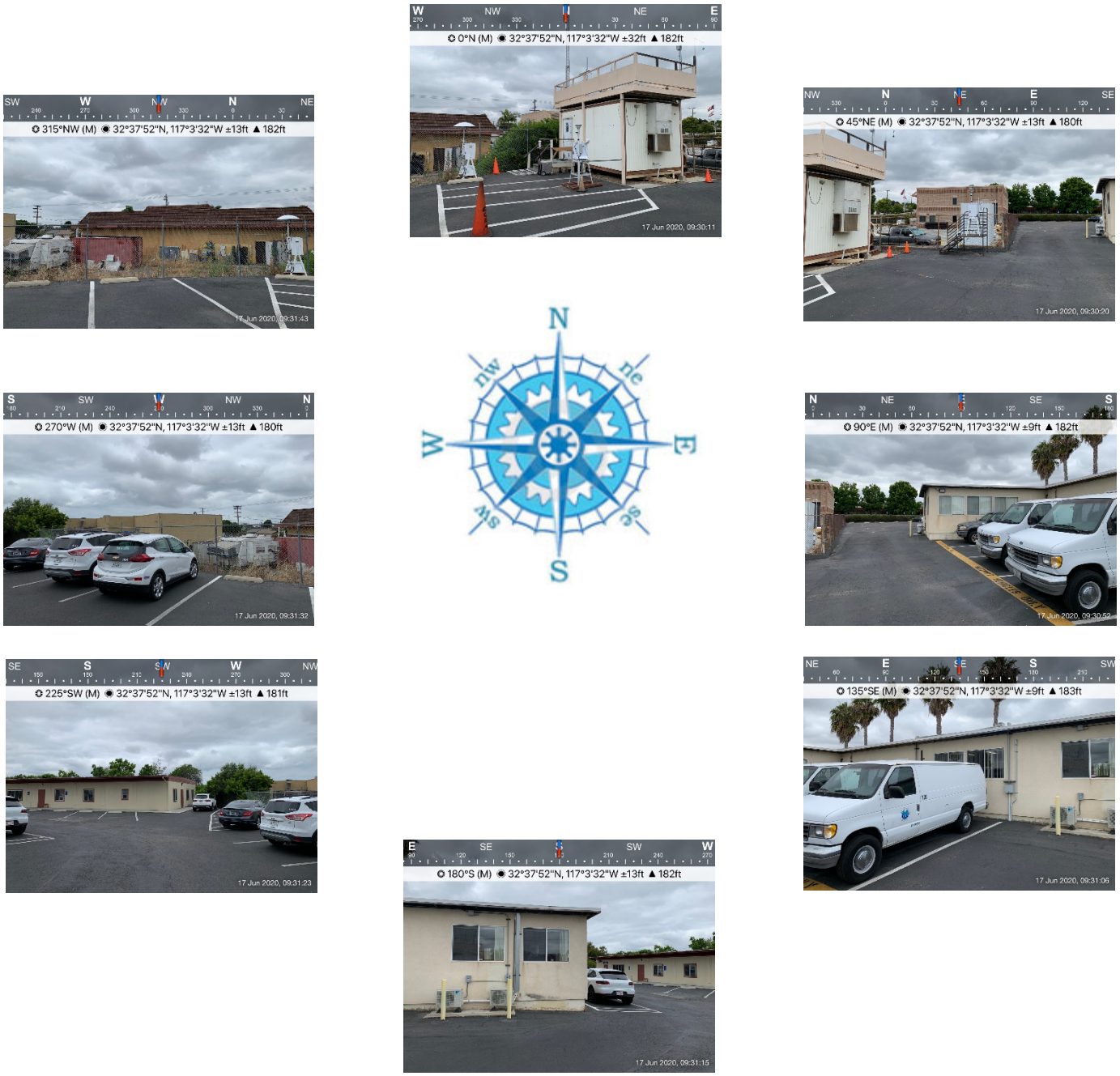

Figure D.2 Chula Vista – Pictures (Directional) from the Ground

Appendix E: Donovan Station Description

Table E-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Donovan
Year Established:	1/2005 PM_{10} sampler original site date; Relocated 800 m east on 7/2014
Site Address:	Donovan State Prison Rd. (200 m west of Alta Rd.)
Site Name Abbreviation:	DVN
AQS Number:	06-073-1014
Latitude:	32.578267 ^{O}
Longitude:	-116 .921359 ^{O}
Elevation above Sea Level:	185 m
General Location:	200 m east of Alta Rd on the Donovan Prison Rd.
Ground Cover:	Asphalt
Distance to Road:	26 m north= Donovan Prison Rd.
Traffic Count (2015 AADT):	Donovan Prison Rd. AADT estimated= 300 (No traffic count available) The closest cross-street with a traffic count, Otay Mesa Rd. at Alta Rd. southwest/downwind 2,100 m = 6,400
Site Description:	This site is situated at the entrance to the Richard J. Donovan Correctional Facility.
Monitoring Objectives:	This site is primarily used to measure neighborhood scale concentrations in the southeast county.
Planned Changes:	*To include PAMS-VOCs (C2-C6 compounds); unknown timeline*

Figure E.1 Donovan – Picture of the Location

Table E-2 Donovan - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Highest Concentration	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	7/2014	7/2014	7/2014	2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	1.56 sec	0.69 sec	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	02/25/19	02/19/19	04/02/19	N/A
NPAP date	8/29/19	8/29/19	N/A	N/A

Table E-3 Donovan - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Continuous (non-FEM)**	**PM_{10} Manual (Hi-Vol)**	**PM_{10} Manual (Hi-Vol)**
POC	1	1	2
Monitor designation	Other	Primary	Collocated
Parameter code	88502 (LC)	85101 (LC) 81102 (STD)	85101 (LC) 81102 (STD)
Basic monitoring objective	Public Information, Research	NAAQS	QAC
Site type	Population Exposure	Highest Concentration	Highest Concentration
Monitor type	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A
Instrument manufacturer & model	Met One BAM 1020	GMW 2000H w/ SA 1200 Head	GMW 2000H w/ SA 1200 Head
Method code	733	063	063
FRM/FEM/ARM/Other	Other (non-FEM)	FRM	FRM
Collecting agency	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD
Spatial scale	Population Exposure	Neighborhood Scale	Neighborhood Scale
Monitoring start date	1/21/2015	7/2014	3/2017
Current sampling frequency	Continuous	1:6	1:6
Required sampling frequency	Continuous	1:6	1:6
Sampling season	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None	None
Any PM Hi-Vol sampler w/in 2m	None	None	None
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No
Suitable for comparison to the NAAQS?	No	No	No
Frequency of flow rate verification	Semi-monthly	monthly	monthly
Semi-Annual flow rate audits dates	01/23/19, 07/30/19	03/13/19, 07/30/19	03/13/19, 07/30/19
Additional QA flow rate check dates*	05/14/19, 11/13/19	N/A	N/A
NPAP date	8/29/19	8/29/19	8/29/19

*Additional QA checks are not official audits

Table E-4 Donovan - Other Pollutants Monitor Designations

Pollutant	TOXICS-VOC	TOXICS-VOC (collocated)	TOXICS-Metals	TOXICS-Carbonyls
POC	1	1	1	1
Monitor designation	Not Applicable	QAC	Not Applicable	Not Applicable
Parameter code	See Toxics Table 11.3	See Toxics Table 11.3	Collected; Not analyzed	See Toxics Table 11.4
Basic monitoring objective	Research	Research	Research	Research
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	Other (SDAPCD Network)	Other (SDAPCD Network)	Other (SDAPCD Network)	Other (SDAPCD Network)
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Xontech 910A (Fused Silica Lined)	Xontech 910A (Fused Silica Lined)	Xontech 924	Atec 8000
Method code	210	210	Collected; Not analyzed	202
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Middle	Middle	Middle	Middle
Monitoring start date	7/2014	7/2014	7/2014	2017
Current sampling frequency	1:6	1:6	1:6	1:6
Required sampling frequency	1:6	1:12	1:6	1:6
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	N/A	N/A	N/A	N/A
NPAP date	N/A	N/A	8/29	N/A

Table E-5 Donovan - Meteorological Equipment Monitor Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics
Method code	012	050	020	040
FRM/FEM/ARM/Other	O	O	O	O
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	7/2014	7/2014	7/2014	7/2014
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	04/03/19	04/03/19	04/03/19	04/03/19
NPAP date	N/A	*	*	*

*The EPA subcontractor does not have the equipment to audit.

Table E-6 Donovan - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI, Hi-Vol (40 cfm)	PM_{10}, QAC, Hi-Vol (40 cfm)	PM_{10} PRI, Lo-Vol (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a				n/a					n/a						n/a	n/a	n/a	n/a
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI, Hi-Vol	n/a				n/a					5.7						6.0	6.0	2.7	n/a
PM_{10}, QAC, Hi-Vol																			
PM_{10}, PRI, Lo-Vol																			
$PM_{2.5}$ FRM, PRI																			
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM	n/a				5.7					n/a						3.3	3.3	3.7	n/a
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC	n/a				n/a					n/a						n/a	0.4	3.4	n/a
Toxics-VOC, QAC	n/a				n/a					n/a						0.4	n/a	3.4	n/a
Toxics-Metals	n/a				2.7											3.4	3.4	n/a	n/a
Meteorology	n/a				n/a					n/a						n/a	n/a	n/a	n/a
height from ground	6.4				5.8					6.4						7.0	7.0	6.1	n/a
distance: from the road	26				26					26						26	26	26	26
from the supporting structure (wood deck)	2.2				1.8					2.0						n/a	n/a	2.2	n/a
from obstructions on roof	N				N					N						N	N	N	N
from obstructions not on roof	N				N					N						N	N	N	N
from the closest tree	N				N					N						N	N	N	N
from furnace/flue	N				N					N						N	N	N	N
unrestricted air flow (degrees)	360				360					360						360	360	360	360

n/a= Not Applicable; N= None; †On the side of the station/trailer

Figure E.2 Donovan – Pictures (Directional) from the Rooftop

Appendix F: Kearny Villa Road Station Description

Table F-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Kearny Villa Rd.
Year Established:	11/5/2010
Site Address:	6125A Kearny Villa Rd.
Site Name Abbreviation:	KVR
AQS Number:	06-073-1016
Latitude:	32.845722 ^{O}
Longitude:	-117.123983 ^{O}
Elevation above Sea Level:	132 m
General Location:	Trailer in the SW corner of Camp Elliot (adjacent to Marine Corps Air Station Miramar).
Ground Cover:	Asphalt & Packed dirt
Distance to Road:	180 m west= Kearny Villa Rd. 542 m southwest= Ruffin Rd.
Traffic Count (2015 AADT):	Kearny Villa Rd. at Ruffin Rd = 15,400
Site Description:	When this location housed only a wind profiler, it was originally called Miramar (MMR). In 2011, when the District relocated the Overland station (KMA) alongside the wind profiler for the PAMS program, it was formally re-designated as KVR. The profiler is decommissioned; the station is located on the southeast section of Marine Corps Air Station Miramar (MCAS) called Camp Elliot.
Monitoring Objectives:	It provides representative data for a large area and is quality assurance location for the $PM_{2.5}$ Manual program.
Planned Changes:	*none*

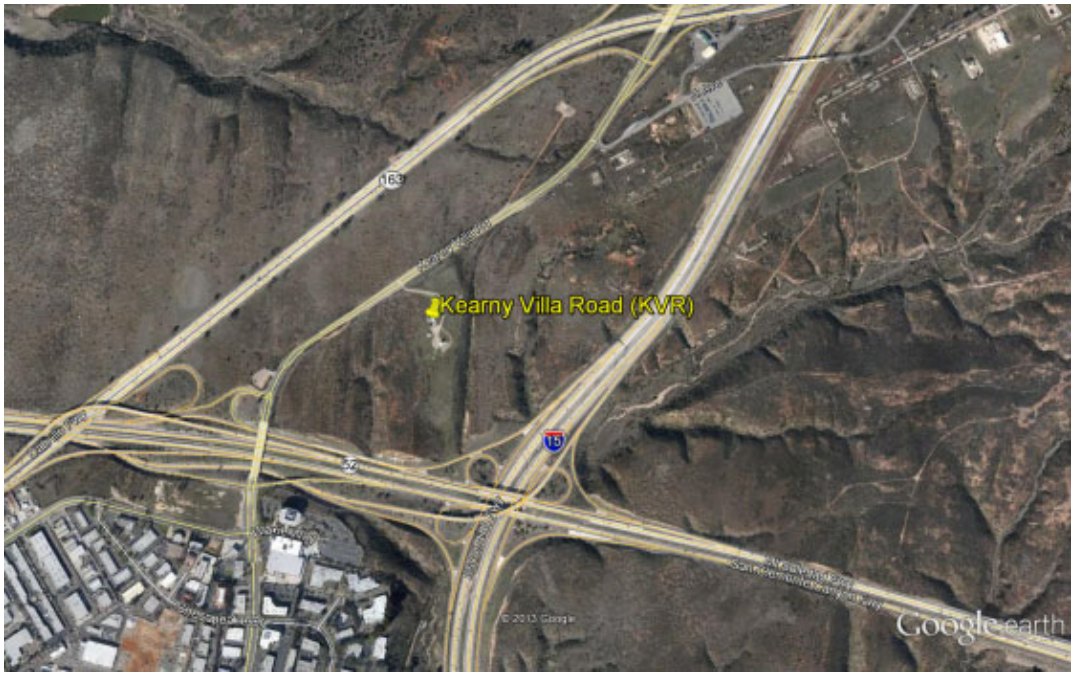

Figure F.1 Kearny Villa Road – Picture of the Location

Table F-2 Kearny Villa Road - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	11/5/2010	11/5/2010	11/5/2010	2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	6.00 sec	10.05 sec	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:14	1:1	N/A	N/A
Annual Performance Evaluation date	01/28/19	02/06/19	10/15/19	N/A
NPAP date	8/27/19	8/27/19	N/A	N/A

Table F-3 Kearny Villa Road - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Manual**	**$PM_{2.5}$ Manual (collocated)**
POC	1	2
Monitor designation	PRI	QAC
Parameter code	88101 (LC)	88101 (LC)
Basic monitoring objective	NAAQS	NAAQS
Site type	Population Exposure	QAC
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Met One E-SEQ-FRM	Met One E-SEQ-FRM
Method code	545	545
FRM/FEM/ARM/Other	FRM	FRM
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	11/5/2010	11/5/2010
Current sampling frequency	1:3	1:12
Required sampling frequency	1:3	1:12
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None
Any PM Hi-Vol sampler w/in 2m	None	None
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Semi-Annual flow rate audits dates	01/23/19, 07/25/19	01/23/19, 07/25/19
Additional QA flow rate check dates*	04/17/19, 09/10/19, 10/10/19	04/17/19, 09/10/19, 10/10/19
NPAP date	8/27/19	8/27/19
PEP date	5/12/19, 11/20/19	N/A

*Additional QA checks are not official audits

Table F-4 Kearny Villa Road - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp	Meteorological Rel. Humidity
POC	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101	62201
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics	Rotronics
Method code	012	050	020	040	012
FRM/FEM/ARM/Other	O	O	O	O	O
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	11/5/2010	11/5/2010	11/5/2010	11/5/2010	11/5/2010
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year round	Year round	Year round	Year round	Year round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	10/18/19	10/16/19	10/16/19	10/18/19	10/18/19
NPAP date	N/A	*	*	*	*

*EPA subcontractor does not have the equipment to audit

Table F-5 Kearny Villa Road - Meteorological Equipment (Additional) Designations

Pollutant	Barometric Pressure	Solar Radiation
POC	1	1
Monitor designation	N/A	N/A
Parameter code	64101	63301
Basic monitoring objective	N/A	N/A
Site type	N/A	N/A
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Rotronics	Eppley
Method code	014	011
FRM/FEM/ARM/Other	O	O
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	11/5/2010	11/5/2010
Current sampling frequency	Continuous	Continuous
Required sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A
Annual Performance Evaluation date	10/18/19	10/18/19
NPAP date	8/27/19	*

*Not done this year
**The Equipment is not operational and must be replaced

Table F-6 Kearny Villa Road - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI, Hi-Vol (40 cfm)	PM_{10}, QAC, Hi-Vol (40 cfm)	PM_{10} PRI, Lo-Vol (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a				n/a			n/a	n/a										n/a
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI, Hi-Vol	n/a				n/a			2.0	2.9										n/a
PM_{10}, QAC, Hi-Vol																			
PM_{10}, PRI, Lo-Vol																			
$PM_{2.5}$ FRM, PRI	n/a				2.0			n/a	2.0										n/a
$PM_{2.5}$ FRM, QAC	n/a				2.9			2.0	n/a										n/a
$PM_{2.5}$ non-FEM																			
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC																			
Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology	n/a				n/a			n/a	n/a										n/a
height from ground	7.6				7.0			7.0	7.0										10
distance: from the road	180				180			180	180										180
from the supporting structure (wood deck)	2.1				1.8			2.0	2.0										n/a
from obstructions on roof	N				N			N	N										N
from obstructions not on roof	N				N			N	N										N
from the closest tree	N				N			N	N										N
from furnace/flue	N				N			N	N										N
unrestricted air flow (degrees)	360				360			360	360										360

n/a= Not Applicable; N= None; †On the side of the station/trailer

Figure F.2 Kearny Villa Road – Pictures (Directional) from the Rooftop

Appendix G: Lexington Elementary School Station Description

Table G-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	El Cajon – Lexington Elementary School
Year Established:	6/2016
Site Address:	533 B. First St.
Site Name Abbreviation:	LES
AQS Number:	06-073-1022
Latitude:	32.789562°
Longitude:	-116.944318°
Elevation above Sea Level:	143 m
General Location:	Trailer on the Lexington Elementary School property off First & Redwood St.
Ground Cover:	Cement pad
Distance to Road:	26.5 m west= First St.
Traffic Count (2015 AADT):	First St.= 4,900
Site Description:	This station is a trailer off the parking lot for the Lexington Elementary School. This area is primarily residences.
Monitoring Objectives:	The El Cajon site represents a major population center located in an inland valley, downwind of the heavily populated coastal zone. It is impacted from the transportation corridor of Interstate 8 and its major arteries. It is classified as a PAMS and NCore site
Planned Changes:	*Site of equipment for PAMS re-engineering.* *Not within 18-mon, but there is no room for expansion, the District will research the viability of reclassifying the Escondido site as NCore. Once this is proven the District will work with EPA to formalize the relocation process.*

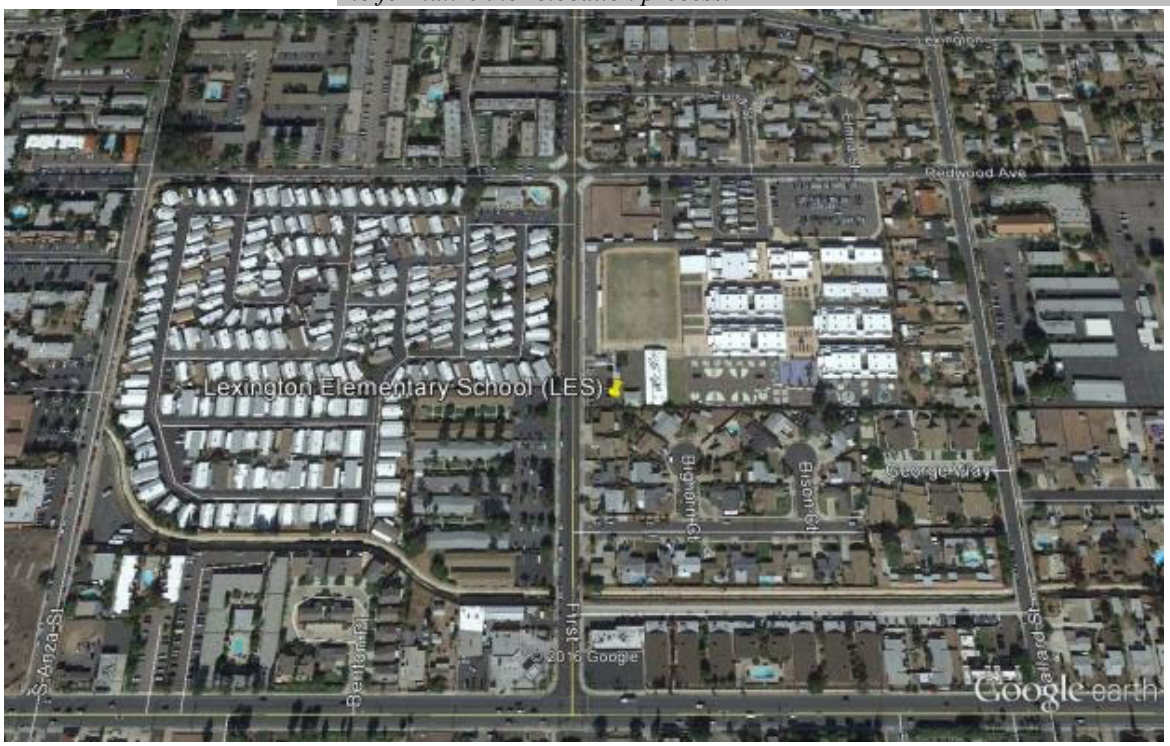

Figure G.1 Lexington Elementary School – Picture of the Location

Table G-2 Lexington Elementary School - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	CO-TLE	SO_2-TLE	NOy-TLE	Other Zero Air	Other Calibrator
POC	1	1	3	3	3	N/A	N/A
Monitor designation	Primary	Primary	Primary	Primary	Other	N/A	N/A
Parameter code	44201	42602 (NO_2)	42101	42401	42612 (NOy-NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	Public Information, NAAQS	Public Information, NAAQS	Public Information, Research	N/A	N/A
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	N/A	N/A
Network affiliation	PAMS, NCore	PAMS	PAMS, NCore	NCore	PAMS, NCore	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Thermo 48i-TLE	Thermo 43i-TLE	Thermo 42i-NOy	Teledyne-API 701H	Teledyne-API T700u
Method code	047	074	554	560	574	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	FRM	FEM	Other	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	7/2016	7/2016	7/2016	7/2016	2/2018	7/2016	7/2016
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	Borosilicate glass	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	12.68 sec	16.32 sec	17.37 sec	18.29 sec	5.21 sec	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes	Yes	Yes	No
Suitable for comparison to the NAAQS?	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	03/18/19	03/11/19	05/29/19, 11/27/19	05/28/19, 11/07/19	06/25/19, 11/14/19	12/05/19	N/A
NPAP date	*	*	*	*	*	N/A	N/A

*Not done this year

Table G-3 Lexington Elementary School - Particulate Pollutants Monitor Designations

Pollutant	$PM_{2.5}$ Manual	$PM_{2.5}$ STN	$PM_{2.5}$ CSN	PM_{10} Manual (Lo-Vol)	PM_{coarse} Manual (paired samplers)	$PM_{2.5}$ Continuous (non-FEM)
POC	1	1	1	2 (LC) 3 (STD)	1	1
Monitor designation	Primary	Other	Other	Other	Other	Other
Parameter code	88101 (LC)	See RTI	See RTI	85101 (LC) 81102 (STD)	86101 (LC)	88502 (LC)
Basic monitoring objective	NAAQS	Research	Research	NAAQS	Research	Public Information, Research
Site type	Highest Concentration	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Highest Concentration
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	NCore	NCore, CSN STN	NCore, CSN STN	NCore	NCore	NCore
Instrument manufacturer & model	Met One E-SEQ-FRM	Met One Super SASS	URG-3000N	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BAM 1020
Method code	545	See RTI	See RTI	246	247	733
FRM/FEM/ARM/Other	FRM	Other	Other	FRM	Other	Other (non-FEM)
Collecting agency	APCD	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	EPA	EPA	APCD	APCD	APCD
Reporting agency	APCD	EPA	EPA	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	6/2016	6/2016	6/2016	6/2016	6/2016	6/2016
Current sampling frequency	1:3	1:3	1:3	1:3	1:3	Continuous
Required sampling frequency	1:3	1:6	1:6	1:3	1:3	Continuous
Any PM Lo-Vol sampler w/in 1m	None	None	None	None	None	Year-round
Any PM Hi-Vol sampler w/in 2m	None	None	None	None	None	None
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A	None
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes	Yes	No
Suitable for comparison to the NAAQS?	Yes	No	No	Yes	No	No
Frequency of flow rate verification	Monthly	Monthly	Monthly	Monthly	Monthly	Semi-monthly
Semi-Annual flow rate audits dates	05/31/19, 12/18/19	06/06/19, 12/18/19	06/06/19, 12/18/19	05/31/19, 12/18/19	05/31/19, 12/18/19	05/31/19, 12/18/19
Additional QA flow rate check dates**	02/25/19, 09/20/19, 10/28/19	02/22/19, 09/19/19	02/22/19, 09/05/19	02/25/19, 09/20/19, 10/28/19	02/25/19, 09/20/19, 10/28/19	02/07/19, 09/04/19
NPAP date	*	*	*	*	*	*
PEP date	3/13/19, 9/19/19	N/A	N/A	N/A	N/A	N/A

*Not done this year

**Additional QA checks are not official audits

Table G-4 Lexington Elementary School - Other Pollutants Monitor Designations

Pollutant	*PAMS-VOC	*PAMS-Carbonyls	Toxics-Metals	Toxics-Carbonyls
POC	TBD	1 for 3-Hr samples 2 for 24-Hr samples	1	1
Monitor designation	Other	Other	Not Applicable	Not Applicable
Parameter code	See PAMS Table 10.15	See PAMS Table 10.16	Table 11-5	Table 11-4
Basic monitoring objective	Research	Research	Research	Research
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	PAMS	PAMS	N/A	N/A
Instrument manufacturer & model	Auto GC	Atec 8000	Xonteck 924	Atec 2000
Method code	228	202	305	202
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	suspended	suspended	7/18/2017	2017
Current sampling frequency	continuous	1:6	1:6	1:6
Required sampling frequency	continuous	1:6	1:6	1:6
Sampling season	June-August	June-August	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	N/A	N/A	N/A	N/A
NPAP date	N/A	N/A	N/A	N/A

*PAMS activities are suspended until re-engineering

Table G-5 Lexington Elementary School - Meteorological Equipment Monitor Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp	Meteorological Rel. Humidity	Meteorological Barometric Press.
POC	1	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101	62201	63301
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics	Rotronics	Rotronics
Method code	012	050	020	040	012	014
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	7/2016	7/2016	7/2016	7/2016	7/2016	3/2017
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	12/26/19	12/27/19	12/26/19	12/30/19	12/30/19	12/26/2019
NPAP date	N/A	*	*	*	*	*

*EPA subcontractor does not have the equipment to audit.

Table G-6 Lexington Elementary School - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI (40 cfm)	PM_{10}, QAC (40 cfm)	PM_{10} PRI (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a	4.1					n/a	n/a		n/a	n/a	n/a	n/a		n/a	n/a		n/a	n/a
NOy Inlet	4.1	n/a																	
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI																			
PM_{10}, QAC																			
PM_{10}, PRI	n/a	n/a					n/a	1.5		1.5	3.3	2.8	n/a		n/a	3.5		4.6	n/a
$PM_{2.5}$ FRM, PRI	n/a	n/a					1.5	n/a		1.4	3.0	2.2	n/a		n/a	3.4		3.8	n/a
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM	n/a	n/a					1.5	1.4		n/a	1.7	1.3	n/a		n/a	2.7		3.0	n/a
$PM_{2.5}$ STN	n/a	n/a					3.3	3.0		1.7	n/a	1.4	n/a		n/a	3.5		2.2	n/a
$PM_{2.5}$ CSN	n/a	n/a					2.8	2.2		1.3	1.4	n/a	n/a		n/a	2.2		1.8	n/a
†PAMS-VOC	n/a	n/a					n/a	n/a		n/a	n/a	n/a	n/a		n/a	n/a		n/a	n/a
†PAMS-VOC QAC																			
†PAMS-Carbonyls	n/a	n/a					n/a	n/a		n/a	n/a	n/a	n/a		n/a	n/a		n/a	n/a
Toxics-VOC	n/a	n/a					3.5	3.4		2.7	3.5	2.2	n/a		n/a	n/a		n/a	n/a
Toxics-VOC, QAC																			
Toxics-Metals	n/a	n/a					4.6	3.8		3.0	2.2	1.8	n/a		n/a	n/a		n/a	n/a
Meteorology	n/a	n/a					n/a	n/a		n/a	n/a	n/a	n/a		n/a	n/a		n/a	n/a
height from ground	7.1	7.1					6.5	6.5		6.4	6.3	6.5	6.4		6.4	6.4		6.0	10.0
distance: from the road	16.8	16.8					16.8	16.8		16.8	16.8	16.8	16.8		16.8	16.8		16.8	16.8
from the supporting structure (wood deck)	1.5	n/a					2.0	2.0		2.0	2.0	2.0	n/a		n/a	n/a		2.1	n/a
from obstructions on roof	N	N					N	N		N	N	N	N		N	N		N	N
from obstructions not on roof	N	N					N	N		N	N	N	N		N	N		N	N
from the closest tree	11.7	13.4					11.0	11.5		10.0	8.3	10.3	11.5		11.6	11.4		10.1	N
unrestricted air flow (degrees)	360						360	360		360	360	360	360		360	360		360	360

n/a= Not Applicable; N= None; †On the side of the station/trailer

Figure G.2 Lexington Elementary School – Pictures (Directional) from the Rooftop

Appendix H: Rancho Carmel Drive Station Description

Table H-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Rancho Carmel Drive
Year Established:	3/26/2015
Site Address:	11403 Rancho Carmel Drive
Site Name Abbreviation:	RCD
AQS Number:	06-073-1017
Latitude:	32.985442°
Longitude:	-117.082180°
Elevation above Sea Level:	218 m
General Location:	On City of San Diego Pump Station grounds
Ground Cover:	Packed Dirt
Distance to Road:	33 meters to I-15 North; 24 meters to Rancho Carmel Drive
Traffic Count (2015 AADT):	AADT (FE adjusted) for I-15= 370,947 (estimated) AADT for Rancho Carmel Dr. at Carmel Mtn Rd.(700 meters downwind) = 16,100
Site Description:	Is on the hill overlooking I-15. The probe is horizontal.
Monitoring Objectives:	This is the 1st near-road site. It measures NO_2, CO, and PM2.5 contributions from I-15
Planned Changes:	*none*

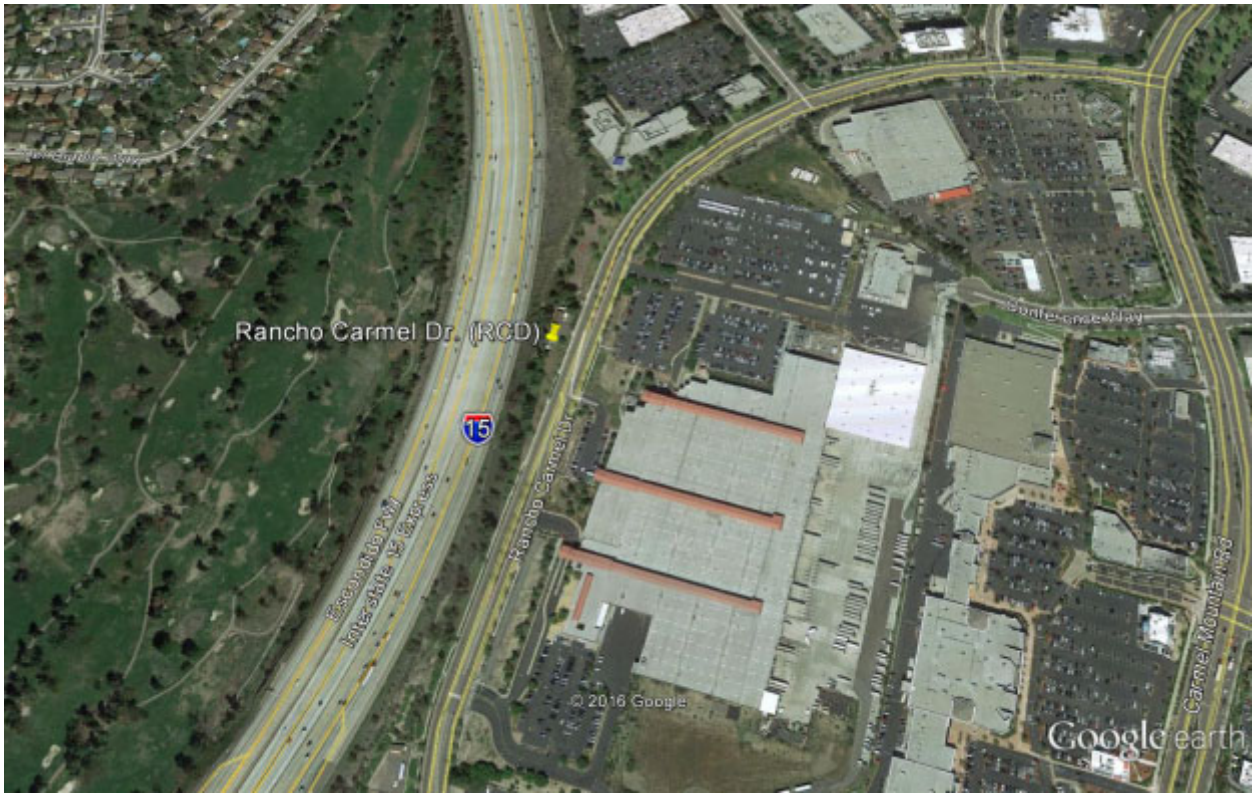

Figure H.1 Rancho Carmel Drive - Picture of the Location of the Station

Table H-2 Rancho Carmel Drive - Gaseous Pollutants Monitor Designations + Other

Pollutant	NO_2	CO	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	42602 (NO_2)	42101	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Source Oriented	Source Oriented	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	Near-road	Near-road	N/A	N/A
Instrument manufacturer & model	Thermo 42i	Thermo 48i-TLE *	Teledyne-API 701H	Teledyne-API T700U
Method code	074	554	N/A	N/A
FRM/FEM/ARM/Other	FRM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Micro Scale	Micro Scale	N/A	N/A
Monitoring start date	3/26/2015	4/24/2015	3/26/2015	3/26/2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	12.82 sec	14.47 sec	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	04/26/19	05/01/19	05/02/19	N/A
NPAP Date	8/22/19	8/22/19	N/A	N/A

* Instrument operated at ambient level range of 20 ppm

Table H-3 Rancho Carmel Drive - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Manual**
POC	1
Monitor designation	Primary
Parameter code	88101 (LC)
Basic monitoring objective	NAAQS
Site type	Source Oriented
Monitor type	SLAMS
Network affiliation	Near-road
Instrument manufacturer & model	Met One E-SEQ-FRM
Method code	545
FRM/FEM/ARM/Other	FRM
Collecting agency	APCD
Analytical laboratory	APCD
Reporting agency	APCD
Spatial scale	Neighborhood Scale
Monitoring start date	06/2019
Current sampling frequency	1:3
Required sampling frequency	1:3
Any PM Lo-Vol sampler w/in 1m	None
Any PM Hi-Vol sampler w/in 2m	None
Probe material for reactive gases	N/A
Residence time for reactive gases	N/A
Any changes within the next 18 months?	Yes
Suitable for comparison to the NAAQS?	Yes
Frequency of flow rate verification	Monthly
Semi-Annual flow rate audits dates	12/27/19
Additional QA flow rate check dates**	05/30/19, 07/16/19
NPAP date	8/22/19
PEP date	*

*Not done this year

**Additional QA checks are not official audits

Table H-4 Rancho Carmel Drive - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological External Temp
POC	1	1
Monitor designation	N/A	N/A
Parameter code	62107	62101
Basic monitoring objective	N/A	N/A
Site type	N/A	N/A
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Rotronics
Method code	012	040
FRM/FEM/ARM/Other	O	O
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Micro-scale	Micro-scale
Monitoring start date	03/2015	03/2015
Current sampling frequency	Continuous	Continuous
Required sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A
Annual Performance Evaluation date	06/0719	04/25/19, 09/19/19
NPAP date	N/A	*

*Not done this year

Table H-5 Rancho Carmel Drive - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI (40 cfm)	PM_{10}, QAC (40 cfm)	PM_{10} PRI (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)***	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a																		
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI																			
PM_{10}, QAC																			
PM_{10}, PRI																			
$PM_{2.5}$ FRM, PRI																			
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM																			
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology																			
height from ground	3							2.05											
distance: from the road	18.1							20.6											
from the supporting structure(wall)	**1.1							N											
*from obstructions on roof (deck)***	N							N											
from obstructions not on roof	N							N											
from the closest tree	11 U 5.6 D							6.35											
from furnace/flue	N							N											
unrestricted air flow (degrees)	270							270											

n/a= Not Applicable; N= None; †On the side of the station/trailer U= upwind; D=downwind

**. It is a horizontal probe placed in the direction of the prevailing wind flow. It goes directly from the analyzer inside the station and out the side of the building with a ledge-like support under the glass.

*** $PM_{2.5}$ sampler is at street level and on no supporting structure.

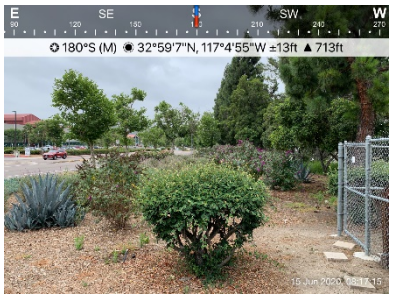

Figure H.2 Rancho Carmel Drive– Pictures (Directional) from the Ground*

*There is no deck from which to take pictures. The probe is horizontal from the side of station on an incline, so all pictures are taken from behind the stations (about 5 meters behind the probe for safety reasons).

Appendix I: McClean Palomar Airport Station Description

Table I-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	McClellan-Palomar (Palomar)
Year Established:	3/10/2012 at old location; 11/1/2014 and current location
Site Address:	2192 Palomar Airport Rd.
Site Name Abbreviation:	CRQ
AQS Number:	06-073-1023
Latitude:	33.130822 ^{O}
Longitude:	-117.272686 ^{O}
Elevation above Sea Level:	92 m
General Location:	Adjacent to the business park (immediately north of the paved access road)
Ground Cover:	Paved
Distance to Road:	380 m east= El Camino Real
Traffic Count (2015 AADT):	El Camino Real at Palomar Airport Rd. (27,300)
Site Description:	Adjacent to business park. In 2014, the samplers were moved from the blast shield area to the current location. There is an auxiliary Airport only access road about 3 meters from the samplers with an AADT= 8; because of this low traffic count, the El Camino Real Drive AADT was used. Additionally, the measurements from the road used El Camino Real Drive.
Monitoring Objectives:	To quantify airborne lead particulates from the combustion of aviation gasoline.
Planned Changes:	*In 2017, site was been petitioned by the District to the EPA for decommissioning.*

Figure I.1 Palomar Airport – Picture of the Location

Table I-2 Palomar Airport - Particulate Pollutants Monitor Designations

Pollutant	**Pb-TSP Hi-Vol (primary)**	**Pb-TSP Hi-Vol (collocated)**
POC	1	2
Monitor designation	PRI	QAC
Parameter code	14129	14129
Basic monitoring objective	NAAQS	NAAQS
Site type	Source Oriented	Source Oriented
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+
Method code	192	192
FRM/FEM/ARM/Other	FRM	FRM
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Micro Scale	Micro Scale
Monitoring start date	3/10/2012 (old site) 11/1/2014 (current site)	3/10/2012 (old site) 11/1/2014 (current site)
Current sampling frequency	1:6	1:12
Required sampling frequency	1:6	1:12
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	Yes	Yes
Suitable for comparison to the NAAQS?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Semi-Annual flow rate audits dates	03/19/19, 09/25/19	03/19/19, 09/25/19
Additional QA flow rate check dates**	06/11/19, 12/09/19	06/11/19, 12/09/19
NPAP date	*	*
PEP date	*	*

*Not done this year

*Additional QA checks are not official audits

Table I-3 Palomar Airport - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI (40 cfm)	PM_{10}, QAC (40 cfm)	PM_{10} PRI (16.7 lpm)	$PM_{2.5}$ FRM, PRI (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet																			
NOy Inlet																			
Pb-TSP, PRI			n/a	3.0															
Pb-TSP, QAC			3.0	n/a															
PM_{10}, PRI																			
PM_{10}, QAC																			
PM_{10}, PRI																			
$PM_{2.5}$ FRM, PRI																			
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM																			
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC																			
†PAMS-VOC QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology																			
height from ground			2.1	2.1															
distance: from the road			356	356															
from the supporting structure			1.5	1.5															
from obstructions on roof			N	N															
from obstructions not on roof			N	N															
from the closest tree			32.0	28.8															
from furnace/flue			N	N															
unrestricted air flow (degrees)			360	360															

n/a= Not Applicable; N= None; †On the side of the station/trailer

Figure I.2 Palomar Airport – Pictures (Directional) from the Ground*
*The sampler is situated at ground level

Appendix J: Sherman Elementary School Station Description

Table J-1 General Site Information

County:	**San Diego**
Representative Area:	San Diego MSA
Site Name:	Sherman Elementary School
	2019
Site Address:	450B 24th St.
Site Name Abbreviation:	SES
AQS Number:	06-073-1026
Latitude:	32.710177^{O}
Longitude:	-117.142665^{O}
Elevation above Sea Level:	35 m
General Location:	At the junction of SR 84 and I-5 and downwind of Downtown San Diego and the Bay
Ground Cover:	Paved
Distance to Road:	14 m east= 24th Street; 281 m NE= Market St & 25 St
Traffic Count (2015 AADT):	Market St. & 25 St.= 9400
Site Description:	This site is downwind of the San Diego Bay industrial zone, and captures emissions from Interstates 5, 805, 15 and Route 94, downtown San Diego, Lindbergh Field, North Island Naval Air Station, marine terminals, NASSCO shipyards, Continental Maritime shipyard, Southwest Marine, and train yards.
Monitoring Objectives:	This site is in an Environmental Justice area. Forecasting of $PM_{2.5}$ levels for several monitoring sites (from Chula Vista to Kearny Mesa) is partially based upon the values collected at this site. This location is useful for capturing high NO_2 concentrations, and assessing ozone transport from the south (Baja, Mexico).
Planned Changes:	*None*

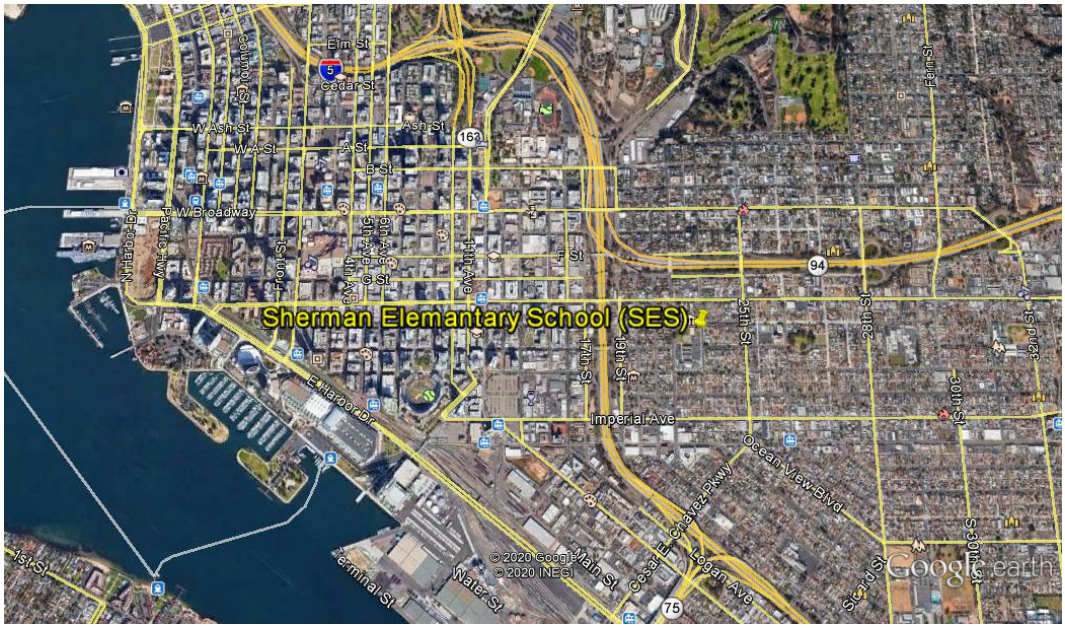

Figure J.1 Sherman Elementary School – Picture of the Location

Table J-2 Sherman Elementary School - Gaseous Pollutants Monitor Designations + Other

Pollutant	O_3	NO_2	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO_2)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	Area-wide	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	07/2019	08/2019	08/2019	08/2019
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	6.93	10.00	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	12/26/19	12/19/19	**	N/A
NPAP date	*	*	N/A	N/A

*Not done this year
**Non-operational at time of scheduled annual performance evaluation

Table J-3 Sherman Elementary School - Particulate Pollutants Monitor Designations

Pollutant	**$PM_{2.5}$ Continuous (non-FEM)**
POC	1
Monitor designation	Other
Parameter code	88502 (LC)
Basic monitoring objective	PI, Research
Site type	Population Exposure
Monitor type	SLAMS
Network affiliation	Not Applicable
Instrument manufacturer & model	Met One BAM 1020
Method code	733
FRM/FEM/ARM/Other	Other (non-FEM)
Collecting agency	APCD
Analytical laboratory	APCD
Reporting agency	APCD
Spatial scale	Population Exposure
Monitoring start date	08/2019
Current sampling frequency	Continuous
Required sampling frequency	Continuous
Any PM Lo-Vol sampler w/in 1m	None
Any PM Hi-Vol sampler w/in 2m	None
Probe material for reactive gases	None
Residence time for reactive gases	N/A
Any changes within the next 18 months?	No
Suitable for comparison to the NAAQS?	No
Frequency of flow rate verification	Semi-monthly
Semi-Annual flow rate audits dates	12/26/19
Additional QA flow rate check dates**	08/28/19, 09/30/19
NPAP date	*
PEP date	N/A

*Not done this year
**Additional QA checks are not official audits

Table J-4 Sherman Elementary School - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics	Qualimetrics	Rotronics
Method code	012	050	020	040
FRM/FEM/ARM/Other	O	O	O	O
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	07/2019	07/2019	07/2019	07/2019
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	**	**	**	**
NPAP date	N/A	*	*	*

*EPA subcontractor does not have the equipment to audit.
** Non-operational at time of scheduled annual performance evaluation

Table J-5 Sherman Elementary School - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP , QAC (44.5 cfm)	PM_{10}, PRI, Hi-Vol (40 cfm)	PM_{10}, QAC Hi-Vol (40 cfm)	PM_{10} PRI, Lo-Vol (16.7 lpm)	$PM_{2.5}$ FRM, PRI* (16.7 lpm)	$PM_{2.5}$ FRM, QAC (16.7 lpm)	$PM_{2.5}$ non-FEM (16.7 lpm)	$PM_{2.5}$ STN (6.7 lpm)	$PM_{2.5}$ CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a							2.39		1.51						3.17	2.98		
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM_{10}, PRI, Hi-Vol																			
PM_{10}, QAC, Hi-Vol																			
PM_{10}, PRI, Lo-Vol																			
$PM_{2.5}$ FRM, PRI*	2.39							n/a		1.20						1.17	1.78		
$PM_{2.5}$ FRM, QAC																			
$PM_{2.5}$ non-FEM	1.51							1.20								2.38	2.60		
$PM_{2.5}$ STN																			
$PM_{2.5}$ CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC	3.17							1.17		2.38						n/a	1.22		
Toxics-VOC, QAC	2.98							1.78		2.60						1.22			
Toxics-Metals																			
Meteorology																			
height from ground	6.21							6.12		6.28						6.03	5.95		
distance: from the road	12.7							14.5		13.1						15.7	15.4		
from the supporting structure (wood deck)	2.06							1.97		2.13						1.87	3.72		
from obstructions on roof	N							N		N						N	N		
from obstructions not on roof	N							N		N						N	N		
from the closest tree	N							N		N						N	N		
from furnace/flue	N							N		N						N	N		
unrestricted air flow (degrees)	360							360		360						360	360		

n/a= Not Applicable; N= None; †On the side of the station/trailer *$PM_{2.5}$ FRM operational Jan, 2020

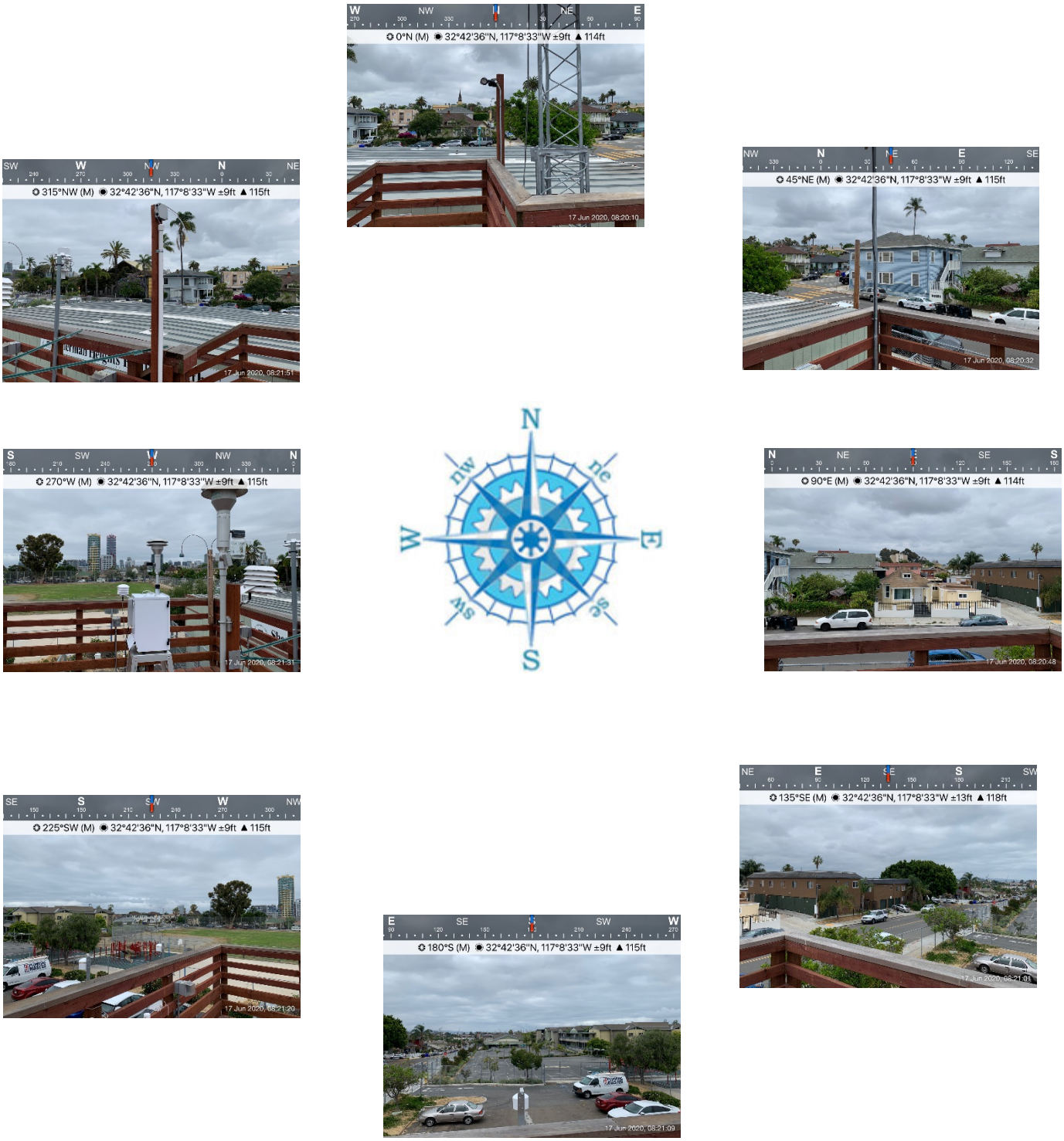

Figure J.2 Sherman Elementary – Pictures (Directional) form the rooftop