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2016 Ambient Air Monitoring Network Report

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2016 Ambient Air Monitoring Network Report

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Acronyms

AQS	EPA's Air Quality System database
BAM	Beta Attenuation Monitor
BCAA	Benton County Clean Air Agency
CBSA	core-based statistical area
CFR	Code of Federal Regulations
CO	carbon monoxide
CSA	combined statistical area
CSN	Chemical Speciation Network
DV	design value
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FDMS	Filter Dynamic Measurement System
FEM	Federal Equivalent Method
FID	flame ionization detector
FRM	Federal Reference Method
IMPROVE	Interagency Monitoring of Protected Visual Environments
MSA	metropolitan statistical area
NAAQS	National Ambient Air Quality Standard
NATTS	National Air Toxics Trends Station
NCore	national core multi-pollutant station
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NO_y	total reactive oxides of nitrogen
NWCAA	Northwest Clean Air Agency
O_3	ozone
ORCAA	Olympic Region Clean Air Agency
Pb	lead
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{10-2.5}$	particulate matter less than 10 microns in diameter and greater than 2.5 microns
PPB	parts per billion
PPM	parts per million

Acronyms Continued

PQAO	Primary Quality Assurance Organization
PSCAA	Puget Sound Clean Air Agency
PSD	prevention of significant deterioration
QA	quality assurance
QA	quality control
SLAMS	State or Local Air Monitoring Station
SO_2	sulfur dioxide
SPMS	Special Purpose Monitoring Site
SRCAA	Spokane Region Clean Air Agency
SWCAA	Southwest Clean Air Agency
STN	Speciation Trends Network
TEOM	Tapered Element Oscillating Microbalance
TSP	total suspended particulate
$\mu g/m^3$	micrograms per cubic meter
VOC	volatile organic compound
YRCAA	Yakima Region Clean Air Agency

Executive Summary

Purpose of the report

Ecology reviews its ambient air quality monitoring network each year to ensure that it collects adequate, representative, and useful air quality data on which to base policy decisions. This report summarizes the results of the 2015 review. These results include:

- Identify modifications to Ecology's ambient air monitoring network since the 2015 annual network report;
- Identify proposed modifications to the network for the upcoming year;
- Document Ecology's ambient air quality monitoring needs, goals, and priorities.

Network Modification Plan

Findings and Recommendations for the 2015 Washington 5-Year Network Assessment

Overall, the Washington State network is efficient and effective at meeting the monitoring policy goal and objectives. Wholesale network changes are not necessary. Several specific, targeted changes will improve overall network effectiveness.

Any resource savings achieved through improvements in network efficiency should be reinvested to address monitoring gaps and high priority future monitoring requirements.

CO:

Discontinue Spokane-3rd St. S. station – While this is a Maintenance Plan/SIP-required site, the data from this monitor is well below the NAAQS, is of little value, and resources could best be used for higher priority monitoring.

Status:

Ecology proposes to remove the CO Monitor at 3rd and Washington (530630049) in Spokane in 2016. Ecology received preliminary approval from EPA for Spokane's draft Second 10-Year Limited Maintenance Plan for Carbon Monoxide. Ecology expects approval this year. The plan includes an alternate method to demonstrate compliance with the 8-hour CO NAAQS and show continued qualification for the Limited Maintenance Plan option. Ecology will include this information in this report through the end of the maintenance period (2025). The alternate method will use an emission inventory strategy, described in Section 6.3.1 of the SIP Revision for the Spokane County Second 10-Year Limited Maintenance Plan for Carbon Monoxide. The monitor will be retained pending final approval of the Plan.

PM_{10}:

Discontinue Yakima-4th Ave. monitor – While this is a Maintenance Plan/SIP-required site, the data from this monitor is well below the NAAQS, is of little value, and resources could best be used for higher priority monitoring. A proxy correlation based on $PM_{2.5}$ data, is proposed.

Status:

Delayed due to higher priority work.

$PM_{2.5}$:

Discontinue nephelometer monitoring at the following sites:

- **Tulalip** - This airshed is sufficiently represented by the Marysville monitor.
- **Oakville** - The Chehalis monitor serves as a conservative proxy for $PM_{2.5}$ monitoring in Oakville.

Replace compliance monitors with FEM BAMs at key monitoring sites:

- **Spokane-Augusta Ave.** - Replace the FRM and FEM TEOM with a FEM BAM.
- **Yakima-4th Ave.** - Replace the FEM TEOM with a FEM BAM. The FRM should be retained to meet collocation requirements for FEM BAMs.
- **Vancouver-NE 84th Ave.** - Replace the FEM TEOM with a FEM BAM.

Status:

All $PM_{2.5}$ work listed has been completed.

Ozone:

Investigate sources of ozone precursors in Kennewick.

Discontinue ozone monitoring at Spokane Augusta – This site is well represented by the Cheney and Spokane Greenbluff sites.

Status:

A joint study with Ecology, WSU and Benton County to determine the sources of ozone precursors will begin in late July and run for three weeks. Analysis will follow. Details should be available in 2017.

Trace Level Gasses:

Discontinue monitoring of Trace-level NO_y at Seattle Beacon Hill.

40 CFR 58, Appendix D, Section 4.3 requires Washington to operate three NO_2 samplers (two "Near-Road" and one "Area-Wide"). After a review of the data, we have found the NO_x and NO_y results to be essentially identical. The magnitude of summertime NO_z at Beacon Hill is extremely small (less than 3 ppb) and falls well within the measured sampler bias of ±5.7%, (±3 ppb). In addition, the results do not indicate a deviation between the NO_y and NO_x analyzers during periods of elevated O_3.

Given the clear redundancy of the NO_y and NO_x samplers at the Beacon Hill site, the State requests a waiver for the NO_y sampling requirement at Beacon Hill.

Status:

The proposal is being re-evaluated – incomplete.

Meteorological:

Install meteorological monitoring at the Yakima $PM_{2.5}$ site.

Status:

Delayed due to higher priority work.

Prioritize implementation of new federal monitoring requirements.

Forthcoming requirements include those associated with the EPA rule revisions for NO_2 and potential new requirements for ozone, SO_2, and lead that EPA is reviewing over the next five years.

Carbon monoxide, (CO, 42101)

Recommendations/Modifications: Ecology proposes to remove the CO Monitor at 3rd and Washington (530630049) in Spokane in 2016. Ecology received preliminary approval from EPA for Spokane's draft Second 10-Year Limited Maintenance Plan for Carbon Monoxide. Ecology expects approval this year. The plan includes an alternate method to demonstrate compliance with the 8-hour CO NAAQS and show continued qualification for the Limited Maintenance Plan option. Ecology will include this information in this report through the end of the maintenance period (2025). The alternate method will use an emission inventory strategy, described in Section 6.3.1 of the SIP Revision for the Spokane County Second 10-Year Limited Maintenance Plan for Carbon Monoxide. The monitor will be retained pending final approval of the Plan.

Additional Monitors: None.

Ozone (O_3, 44201)

The ozone rule was signed October 1, 2015 and was effective December 28, 2015. The new 8-hour ozone standard is 0.070 ppm and is based on the annual fourth-highest daily maximum 8-hour concentration, averaged over three years.

In 2019, Washington will be required to collect and report Photochemical Assessment Monitoring Station (PAMS) measurements at the Seattle Beacon Hill NCore site under CFR 40 Part 58, Appendix D, paragraph 3(a) located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.

Recommendations/Modifications: None.

Additional Monitors: None.

Nitrogen dioxide (NO_2, 42600, 42601, 42612)

Recommendations/Modifications: Ecology's second near-road site began NO_2 monitoring January 1, 2016.

Additional Monitors: None.

Sulfur dioxide (SO_2, 42401)

Recommendations/Proposed Modifications: Proposed inclusion of three SO_2 monitors at two aluminum smelters (Intalco/Alcoa in Ferndale (2) and Alcoa Wenatchee) starting January 1, 2017.

Additional Monitors: None.

Particulate matter 10 (PM_{10}, 81102)

Recommendations/Proposed Modifications: None.

Additional Monitors: None.

Thurston County Maintenance Area (Lacey $PM_{2.5}$)

The Lacey-College Street $PM_{2.5}$ nephelometer site (530670013) is being used to assure continued compliance with the PM_{10} NAAQS as well as to confirm the Thurston County Maintenance Area (TCMA) continues to meet the qualification criteria of EPA's Limited Maintenance Plan (LMP) approach.

A 5-year NPM_{10} design value below 98$\mu g/m^3$ demonstrates the TCMA continues to qualify for the LMP approach. The Lacey-College Street nephelometer site's (53670013) 5-year PM_{10} design value estimate for 2011–2015 was 43 $\mu g/m^3$. The PM_{10} design value estimate for 2013–2015 was 42 $\mu g/m^3$. The current design value estimates demonstrate the TCMA complies with the PM_{10} standard and continues to meet EPA's LMP qualification criteria.

Kent, Seattle, and Tacoma PM_{10} Maintenance Areas

Three- and five-year design values for the Kent, Seattle, and Tacoma PM_{10} Maintenance Areas were calculated using the table lookup method and the statistical fit method outlined in the LMP guidance document.

A 3-year PM_{10} design value of 150 $\mu g/m^3$ or below demonstrates continued compliance with the PM_{10} NAAQS. A 5-year design value below 98 $\mu g/m^3$ is required to qualify for the LMP approach. Design values calculated using the table lookup method fall within the range of uncertainty of the statistical fit method. Because they are the most conservative values, only the statistical fit values are presented here.

The $PM_{2.5}$ FEM TEOM at James Street and Central Avenue (530332004) is used to assure continued compliance with the PM_{10} NAAQS and to confirm continued eligibility for the LMP approach. The 2015 5-year design value is 48±3 $\mu g/m^3$ and the 3-year design value is 49±2 $\mu g/m^3$.

The $PM_{2.5}$ FEM TEOM at Seattle-Duwamish (530330057) is used to assure continued compliance with the PM_{10} NAAQS and to confirm continued eligibility for the LMP approach. The 2015 5-year design value is 57±6 $\mu g/m^3$ and the 3-year design value is 59±6 $\mu g/m^3$. Note: In 2014, Duwamish did not have a complete year of data due to site relocation. The design values for Duwamish were calculated using the guidelines for incomplete data outlined in Appendix B, page B-1, of the PM_{10} SIP Development Guide.

The $PM_{2.5}$ nephelometer at Tacoma-Alexander Avenue (530530031) is used to assure continued compliance with the PM_{10} NAAQS and to confirm continued eligibility for the LMP approach. The 2015 5-year design value is 66±16 $\mu g/m^3$ and the 3-year design value is 68±23 $\mu g/m^3$.

Spokane County Maintenance Area (Spokane PM_{10})

The Spokane County Maintenance area design value is based on FRM and FEM 24-hour PM_{10} monitoring data from the Augusta Avenue site (530630021) in Spokane. The LMP Guidance directs the design value be based on the most recent five years' of data. The most recent five years of data is from 2011–2015 using a combination of FRM and FEM data from the Augusta site.

A 5-year PM_{10} design value below 98 µg/m^3 demonstrates the Spokane County Maintenance Area continues to qualify for the LMP approach. The 5-year PM_{10} design value estimate for 2011–2015 was 84 µg/m^3 (using the table lookup method presented in Section 6.3.1 of the EPA's *PM10 SIP Development Guideline (EPA 450/2-86-001)*). For the 3-year compliance with the PM_{10} NAAQS, the form of the standard is the number of 24-hour exceedances of 150 µg/m^3, averaged over three years. The 2015 PM_{10} design value for Augusta Avenue (530630021) is 0.4. This design value is in attainment with the standard, which is not to exceed one. However, reroofing caused the monitor to be shut down July 17 through September 18. Data capture for the third quarter was only 30 percent. The Spokane County Maintenance Area complies with the PM_{10} NAAQS and continues to meet EPA's LMP qualification criteria.

Particulate matter 2.5 ($PM_{2.5}$, 88101, 88502)

Recommendations/Modifications: Per the recommendations of the 2015 Washington 5-Year Assessment, $PM_{2.5}$ BAM 1020 monitors were installed in Spokane, Vancouver and Yakima and the $PM_{2.5}$ FRM sampler was discontinued on 3/31/2016. ORCAA has delayed relocation of the Aberdeen site until 2018. Puget Sound Clean Air Agency (PSCAA) lost the lease at Lake Forest Park and the site was discontinued on 2/29/2016. During the winter of 2014 and 2015, PSCAA performed a mobile nephelometer study in the Shoreline, Lake Forest Park, and Lynnwood communities. Mobile studies indicated some locations in Shoreline that would be able to replace the LFP monitor for calling burn bans in North King County. PSCAA has had discussions with the Shoreline school district, and have not made very much progress. Discussions with other entities within Shoreline are planned. The schedule is to have a monitoring site location identified by the end of August 2016, and then have a monitoring site installed by Nov 1 2016.

Additional Monitors: None.

Notes: Nephelometers are not EPA-equivalent method compliance instruments and design values are estimates.

Ecology uses the Washington Air Quality Advisory (WAQA) for reporting $PM_{2.5}$ to inform and protect citizens of Washington. WAQA reporting is more protective of human health.
Ecology's goal is to keep 24-hour concentrations below 20µg/m.
Certain monitors in areas of Washington are <u>not</u> intended to be solely NAAQS based. Such monitors are used for protection of human health by issuing burn bans when needed during home heating season, making daily decisions for agricultural burning and health information reporting $PM_{2.5}$-like values.

Meteorological monitoring (Met. 61101, 61102, 62101)

Recommendations/Modifications: None.

Additional Monitors: Meteorological monitoring began at the Tacoma near-road site in February 2016. The addition of meteorological monitoring is planned for Yakima during 2016 pending landlord approval.

Lead (Pb 14129)

Recommendations/Modifications: EPA discontinued the requirement for Pb sampling at NCore sites. Washington will continue to monitor for Pb at Seattle Beacon Hill.

Additional Monitors: None.

Trace gas monitoring

Recommendations/Modifications: None.

Additional Monitors: None.

NCore

Recommendations/Modifications: None.

Additional Monitors: None.

Other – contracted sites tribal/EPA

Recommendations/Modifications: None.

Additional Monitors: None.

Other – contracted sites USFS

Recommendations/Modifications: None.

Additional Monitors: None.

Other – contracted local clean air agencies

Recommendations/Modifications: SRCAA discontinued ozone monitoring at Spokane Augusta.

Additional Monitors: None.

Note: Ecology provides technical support for Anacortes and Cheeka Peak.

Background Information

EPA ambient air quality surveillance regulations (40 CFR Part 58) require states to establish air quality surveillance systems in their State Implementation Plans (SIPs). An air quality surveillance system consists of a network of State and Local Air Monitoring Stations (SLAMS). These stations measure ambient concentrations of those air pollutants for which 40 CFR Part 50 sets standards.

Monitoring network requirements

SLAMS must meet requirements of 40 CFR Part 58 contained in:

- Appendix A (Quality Assurance Requirements)
- Appendix C (Ambient Air Quality Monitoring Methodology)
- Appendix D (Network Design Criteria)
- Appendix E (Probe and Path Siting Criteria)

States determine if they conform to Appendices A and C in part through periodic systems and performance audits (per Section 2.4 of Appendix A). States conform to Appendices D and E by conducting an annual network review of their air quality surveillance systems (per 40 CFR 58.20(d)). The annual network review:

- Determines if an ambient air quality monitoring network is achieving its required air monitoring objectives;
- Identifies changes to the network needed to enable an organization to meet its objectives.

Using monitoring data

Ecology uses its air monitoring data to:

- Determine compliance with the National Ambient Air Quality Standards (NAAQS).
- Determine maximum pollutant concentrations.
- Forecast air quality.
- Evaluate the effectiveness of air pollution control programs.
- Evaluate the effects of air pollution on public health.
- Track the progress of SIPS.
- Support dispersion models.
- Determine air quality trends.
- Develop responsible and cost-effective pollution control strategies.
- Analyze pollution episodes.
- Assist with permitting work.

Introduction

40 CFR Part 58 contains EPA's ambient air quality surveillance regulations. Section 58.20 requires states to establish air quality surveillance systems in their SIPs. The air quality surveillance system consists of a network of designated SLAMS. These stations measure ambient concentrations of those air pollutants for which standards exist in 40 CFR Parts 50 and Part 58, Appendices A (Quality Assurance Requirements), C (Ambient Air Quality Monitoring Methodology), D (Network Design Criteria), and E (Probe and Path Siting Criteria). States determine compliance with Appendices A and C in part through periodic systems and performance audits (per Section 2.4 of Appendix A). States comply with Appendices D and E by conducting an annual network review of their air quality surveillance systems (per 40 CFR 58.20(d)).

The annual network review determines if the network achieved its required air monitoring objectives and if it should be modified (e.g., termination, relocation, or establishment of monitoring stations) to meet those objectives. The main purpose of this review is to ensure that an ambient air quality monitoring network collects adequate, representative, and useful air quality data on which to base policy decisions. The ambient air quality data from Ecology's network is used for a variety of purposes, including:

- Determine compliance with the NAAQS.
- Determine the location of maximum pollutant concentrations.
- Determine the effectiveness of air pollution control programs.
- Evaluate the effects of air pollution on public health.
- Track the progress of SIPS.
- Support dispersion models.
- Develop responsible, cost-effective, control strategies.
- Develop air quality trends.
- Analyze pollution episodes.
- Assist with permitting work.

EPA Region 10 Approved Network Changes in 2015

EPA discontinued the Oakville and Tulalip tribal sites in 2015.

Relocation/termination details can be found in the 2015 Washington Annual Network Plan.

Regulatory Requirements and Other Data Needs

Appendix D requirements

Appendix D of 40 CFR 58 describes concepts for designing the SLAMS network. It addresses monitoring objectives and the criteria for selecting the location and number of air monitoring

stations. The concepts and guidance in Appendix D, as well as other non-regulatory EPA data needs, should be considered when evaluating the adequacy of the SLAMS network.

Monitoring objectives and spatial scales

Appendix D calls for the design of SLAMS networks to meet a minimum of six basic objectives:

1. Determine the highest pollutant concentrations expected in the area covered by the network.
2. Determine representative pollutant concentrations in areas of high population density.
3. Determine the impact of significant sources or source categories on pollutant concentrations in the ambient air.
4. Determine general background pollutant concentrations.
5. Determine the regional extent of pollutant transport between populated areas.
6. Determine the impacts (e.g., visibility impairment, vegetation effects) in more rural and remote areas on the secondary (i.e., welfare) standards.

SLAMS networks are designed to provide data for meeting the monitoring objectives described above, and to assist EPA and states in solving environmental problems.

Appendix D also provides guidance on spatial scales of representativeness for stations in a SLAMS network (Table 1). Ideally, the monitor is located so that its sample represents the air quality over the entire area that the monitoring station is intended to represent (Table 2).

Table 1. Relationship Between Monitoring Objectives and Scale of Representativeness

Monitoring Objectives	Appropriate Siting Scales
Highest concentration	Micro, middle, neighborhood, urban
Population	Neighborhood, urban
Source impact	Micro, middle, neighborhood
General/Background	Neighborhood, urban, regional
Regional transport	Urban/regional
Welfare-related impacts	Urban/regional

Table 2. Summary of Spatial Scales for SLAMS

	Scales Applicable for SLAMS						
	SO_2	CO	O_3	NO_2	PB	PM_{10}	$PM_{2.5}$
Micro. . .	✓	✓			✓	✓	✓
Middle. . .	✓	✓	✓	✓	✓	✓	✓
Neighborhood. . .	✓	✓	✓	✓	✓	✓	✓
Urban. . .	✓		✓	✓	✓	✓	✓
Regional. . .	✓		✓		✓	✓	✓

Number of state and local air monitoring stations

Appendix D to 40 CFR Part 58 does not contain criteria for determining the total number of stations in the SLAMS network, except for requiring a minimum number of SLAMS lead, SO_2, and $PM_{2.5}$ sites. For lead, EPA requires state and local agencies to focus their network design efforts on establishing monitoring stations around lead stationary sources which generate or have the potential to generate exceedances of the quarterly lead NAAQS. Sources around which lead monitoring networks should be established are those emitting half ton or more per year. Other factors affect the number of stations in the network. SLAMS SO_2 monitoring requirements for counties not within the boundaries of any Consolidated Metropolitan Statistical Area/Metropolitan Statistical Area (CMSA/MSA) are based on the emissions of SO_2 in the airshed. A minimum number of SO_2 SLAMS sites are required for targeted sources of SO_2 emissions. Other than these requirements, the optimum size of a particular SLAMS network involves tradeoffs between data needs and available resources, which can best be resolved during the network design process.

Appendix E requirements

Appendix E contains siting criteria to be applied to ambient air quality analyzers or samplers after the general site location has been selected based on the monitoring objectives and spatial scales of representativeness presented in Appendix D and summarized in Section 2.1 of this document. The siting criteria presented in Appendix E are summarized in Table 3.

Other ambient air monitoring data needs

Ecology uses nephelometers throughout Washington. Nephelometers serve many purposes, including the WAQA program, ambient air quality assessment, and special studies. Typically, nephelometer monitoring sites utilize Federal Reference Method (FRM) or Federal Equivalent Method (FEM) equipment for correlations and are operated in accordance with CFR requirements for quality assurance and quality control. Ecology occasionally uses SPMS designation for criteria pollutant monitoring sites, which allows Ecology to assess ambient levels within regions of the state, while providing the flexibility to relocate the site if it is determined there is no concern for NAAQS violations. An SPMS site may be added to Ecology's SLAMS network if a NAAQS exceedance has been recorded, or if pollutant concentrations are consistently measured at or greater than 80 percent of the standard.

Table 3. Summary of Probe and Monitoring Path Siting Criteria

Pollutant	Scale (maximum monitoring path length (meters))	Height from Ground to Probe or 80% of Monitoring Path (meters)	Horizontal & Vertical Distance from Supporting Structures to Probe or 90% of Monitoring Path (meters)	Distance from Trees to Probe or 90% of Monitoring Path (meters)
SO_2	Middle [300m] Neighborhood Urban & Regional [1km]	3–15	>1	>10

Table 3. Summary of Probe and Monitoring Path Siting Criteria				
Pollutant	**Scale (maximum monitoring path length (meters))**	**Height from Ground to Probe or 80% of Monitoring Path (meters)**	**Horizontal & Vertical Distance from Supporting Structures to Probe or 90% of Monitoring Path (meters)**	**Distance from Trees to Probe or 90% of Monitoring Path (meters)**
CO	Micro, Middle [300m] Neighborhood [1km]	3±0.5; 3–15	>1	>10
O_3	Middle [300m] Neighborhood Urban & Regional [1km]	3–15	>1	>10
Ozone precursors	Neighborhood & Urban [1km]	3–15	>1	>10
NO_2	Middle [300m] Neighborhood & Urban [1km]	3–15	>1	>10
PM_{10}	Micro; Middle, Neighborhood Urban & Regional	2–7 (Micro); 2–15 (all other scales)	>2 (all scales horizontal distance only)	>10 (all scales)

Network review team and preparation

Network report participants include Ecology's Air Quality Program staff. Sufficient information is provided to determine compliance of the network with regulatory network design and siting requirements specified in 40 CFR Part 58, Appendices D and E as to determine compliance of the network design and siting requirements specified for all special ambient air monitoring networks.

Network modifications

Modifications to the SLAMS network are addressed in 40 CFR 58.25, 58.36, and 58.46, respectively. Under Section 58.25, States are required to annually develop and implement schedules to modify the SLAMS network to eliminate any unnecessary stations or to correct any inadequacies indicated by the annual network review required by 58.20(d). As part of the annual network review, evaluations of the special networks established as partnership agreements between EPA and Ecology should also be conducted. Modifications to these networks should be recommended as a result of this annual report.

An important objective of the network modification process is determining whether or not sufficient ambient air quality information and data are being provided by the regulatory and other special monitoring networks to satisfy the principal data needs. If sufficient air quality data are not being collected, the deficient area must be identified and corrective action taken to resolve the problem. Conversely, if it is determined that excessive data are being collected (e.g., there

are redundant sites resulting in data that agree closely), then efforts need to be taken to determine where disinvestment should be made and on what schedule.

Network modifications may be initiated by EPA or proposed by Ecology and agreed to by EPA. Network modifications may result from revisions to the Part 58 regulations, systems audits, site visits, or performance evaluations; special studies/saturation sampling, population increases/decreases; air quality concentrations consistently recorded below the NAAQS. Loss of permission to use a site; demolition of a building which is used for monitoring; building construction; growth of trees; changes in roadways; change in neighborhood type of use, etc.

Determining compliance with Appendix D/special monitoring requirements

Ecology uses this review to determine whether it is meeting the number of monitors required by the Part 58 Appendix D design criteria requirements, and whether the monitors properly located based on the monitoring objectives and spatial scales of representativeness presented in Appendix D.

Number and location of monitors

For SLAMS, the number of monitors required and their locations are not specified in the regulations but rather are determined by EPA Region 10 and Ecology on a case-by-case basis. EPA and Ecology ensure that SLAMS meet the monitoring objectives specified in Appendix D. Adequacy of the network is being determined by using a variety of tools. Appropriate location of monitors can be determined on the basis of stated objectives.

Monitor locations are based on the objectives specified in Appendix D, Section 3. Most often, these locations are those having high concentrations and large population exposure. Population information may be obtained from the latest census data and ambient monitoring data from AQS. If zip codes for various monitoring locations are obtained, use of electronic media census information and GIS-based information can be more easily combined with ambient monitoring data.

For special monitoring needs, program documents applicable to the network must be reviewed to determine the goals and specific siting criteria for the network. Compliance with monitoring objective determinations of the special network should be conducted using procedures similar to those used for Appendix D evaluations (are the number of monitors appropriate and are the monitors properly located).

Determining compliance with Appendix E requirements

Applicable siting criteria for SLAMS are specified in 40 CFR 58, Appendix E. The on-site visit itself consists of the physical measurements and observations needed to determine compliance with the Appendix E requirements, such as height above the ground level, distance from trees, paved or vegetative ground cover, etc.

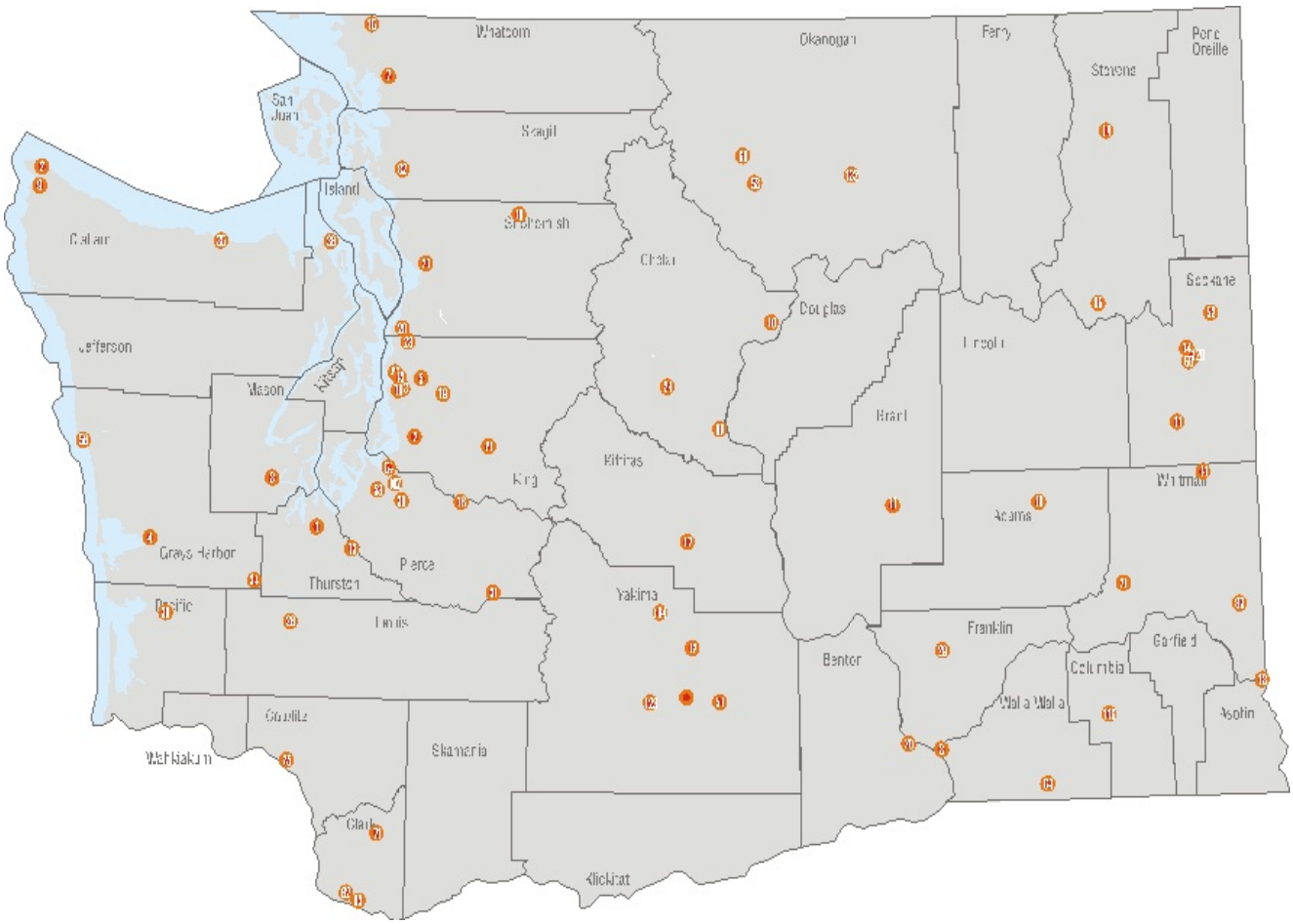


Figure 1. Map of Washington monitoring (all sites)

Table 4. CO, Parameter Code 42101						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Frequency**	**Action for 2016**
530630049	Spokane, 3rd & Washington	1/97	SLAMS	Micro	Continuous	Discontinue
530330080	Seattle Beacon Hill	3/07	NCore	Urban	Continuous	Continue
530330030	Seattle 10th & Weller	4/14	Near-road	Urban	Continuous	Continue
530090013	Cheeka Peak	5/06	Rural NCore	Regional	Continuous	Continue

Additional Monitors: None.

Recommendations/Modifications: Ecology proposes to remove the Spokane CO monitor at 3rd and Washington (530630049) before the end of 2016. Ecology received preliminary approval from EPA for Spokane's draft second ten year maintenance plan for CO. The plan includes an alternate method to demonstrate compliance with the 8-hour CO NAAQS and show continued qualification for the LMP option. Ecology will include this information in this report through the end of the maintenance period (2025). The alternate method will use an emission

inventory strategy, described in 6.3.1 of the SIP Revision for the Spokane County Second 10-Year Limited Maintenance Plan for Carbon Monoxide. The monitor will be retained pending final approval of the Plan.

Figure 2. Map of Washington CO sites

Spokane, 3rd and Washington

Site Name	Spokane, 3rd and Washington – SLAMS
AQS ID	530630049
GPS coordinates	LAT/LONG: 047 39' 13"/117 25' 07"
Location	At 3rd and Washington, Downtown Spokane
Address	3rd and Washington
County	Spokane
Distance to road from gaseous probe (meters)	1
Traffic count (AADT, year)	94,000 I-90 (2012 WSDOT)
Groundcover	Asphalt
Statistical Area	Spokane
Monitor Information Pollutant, POC	
Parameter code	42101
Basic monitoring objectives(s)	NAAQS comparison
Site type(s)	Highest Concentration
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 48 C
Method code	054
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	1/97
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	63.50
Changes within the next 18 months?	Site is scheduled to be discontinued in 2016
Is it suitable for comparison against the annual CO NAAQS?	Yes

Purpose: 3rd and Washington is a micro scale SLAMS site established in 1997. It is located in the downtown core of Spokane in a highly-traveled commercial area. The site is currently used for CO maintenance plan compliance. Spokane is a former CO nonattainment area.

Exceedances: This site has <u>not</u> exceeded the daily or annual standard for CO in over 15 years.

Seattle, Beacon Hill

Site Name	Seattle Beacon Hill
AQS ID	530330080
GPS coordinates	LAT/LONG: 047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue S., Seattle
County	King
Distance to road from gaseous probe (meters)	120
Traffic count (AADT, year)	12,700 (2012 WSDOT)
Groundcover	Grass, gravel
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	42101 (POC 2)
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Background
Monitor type(s)	NCore
Instrument manufacturer and model	ne-API 300EU
Method code	593
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	6/79 established, 3/07 Trace level CO
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	4.65
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	20
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	15
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the annual CO NAAQS?	Yes

Purpose: Beacon Hill is an urban scale NCORE site located south of downtown Seattle, within Jefferson Park/reservoir. In addition to ozone, Beacon Hill site is used for monitoring trace level CO, SO_2, NO_y, $PM_{2.5}$, air toxics, and speciation. Seattle Beacon Hill is also a long-term trend and research site.

Seattle, 10th and Weller

Site Name	Seattle, 10th and Weller
AQS ID	530330030
GPS coordinates	LAT/LONG: 047 59' 72"/122 31' 97"
Location	Adjacent to Interstate 5 in Downtown Seattle
Address	10th and Weller
County	King
Distance to road from gaseous probe (meters)	6
Traffic count (AADT, year)	146,000 I-5 (2012 WSDOT)
Groundcover	Concrete, Grass
Statistical Area	Seattle-Bellevue-Everett, WA

Monitor Information Pollutant, POC	
Parameter code	42101 (POC 2)
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API T300EU
Method code	593
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	4/14
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	3
Distance from supporting structure (meters)	3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	1.6
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the annual CO NAAQS?	Yes

Purpose: Seattle 10th and Weller is Washington's primary near-road monitoring site. CO monitoring is EPA-required at one near-road site.

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	LAT/LONG: 048 17' 12"/124 37' 13"
Location	At Cheeka Peak
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	Not near a road
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	42101 (POC 2)
Basic monitoring objectives(s)	Research
Site type(s)	Background/Regional Transport
Monitor type(s)	Rural NCore
Instrument manufacturer and model	Teledyne-API T300U
Method code	593
FRM/FEM/ARM/other	FEM
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	5.5
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	21
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	0.3 to 0.6
Unrestricted airflow (degrees)	175
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	1.9
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the annual CO NAAQS?	Yes

Purpose: Cheeka Peak is a rural NCore site located at the northwestern tip of Washington. It is recognized as a national transport site.

Table 5. O_3, Parameter Code 44201						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Frequency**	**Action for 2016**
530009013	Cheeka Peak	5/06	Rural NCore	Regional	Continuous	Continue
530630001	Cheney, Turnbull	5/99	SLAMS	Urban	Continuous	Continue
530730005	Custer/Loomis	4/89	SLAMS	Urban	Continuous	Continue
530330023	Enumclaw, Mud Mtn.	7/98	SLAMS	Urban	Continuous	Continue
530330010	Issaquah, Lake Sam	12/75	SLAMS	Urban	Continuous	Continue
530050003	Kennewick	6/15	SLAMS	Urban	Continuous	Continue
530530012	Mt. Rainier, Jackson Visitor Center	7/98	SLAMS	NPS supported	Continuous	Continue
530330017	North Bend, NB Way	6/98	SLAMS	Urban	Continuous	Continue
530330080	Seattle, Beacon Hill	4/97	NCore	Urban	Continuous	Continue
530630046	Spokane, Greenbluff	4/90	SLAMS	Urban	Continuous	Continue
530110011	Vancouver, Blairmont	5/88	SLAMS	Urban	Continuous	Continue
530670005	Yelm, Northern Pacific	5/06	SLAMS	Urban	Continuous	Continue

Additional Monitors: None.

Recommendations/Proposed Modifications: None.

The Ozone Final rule was signed October 1, 2015, and effective December 28, 2015. The new 8-hour ozone standard, finalized October 1, 2015, is 0.070 ppm, and is based on the annual fourth-highest daily maximum 8-hour concentration, averaged over three years.

In 2019, Washington will be required to collect and report Photochemical Assessment Monitoring System (PAMS) measurements at the Seattle Beacon Hill NCore site under CFR 40 Part 58, Appendix D, paragraph 3(a) located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.

Note: Ecology provides technical support for ozone monitoring performed by the Northwest Clean Air Agency (NWCAA) in Mount Vernon. See Other Agencies.

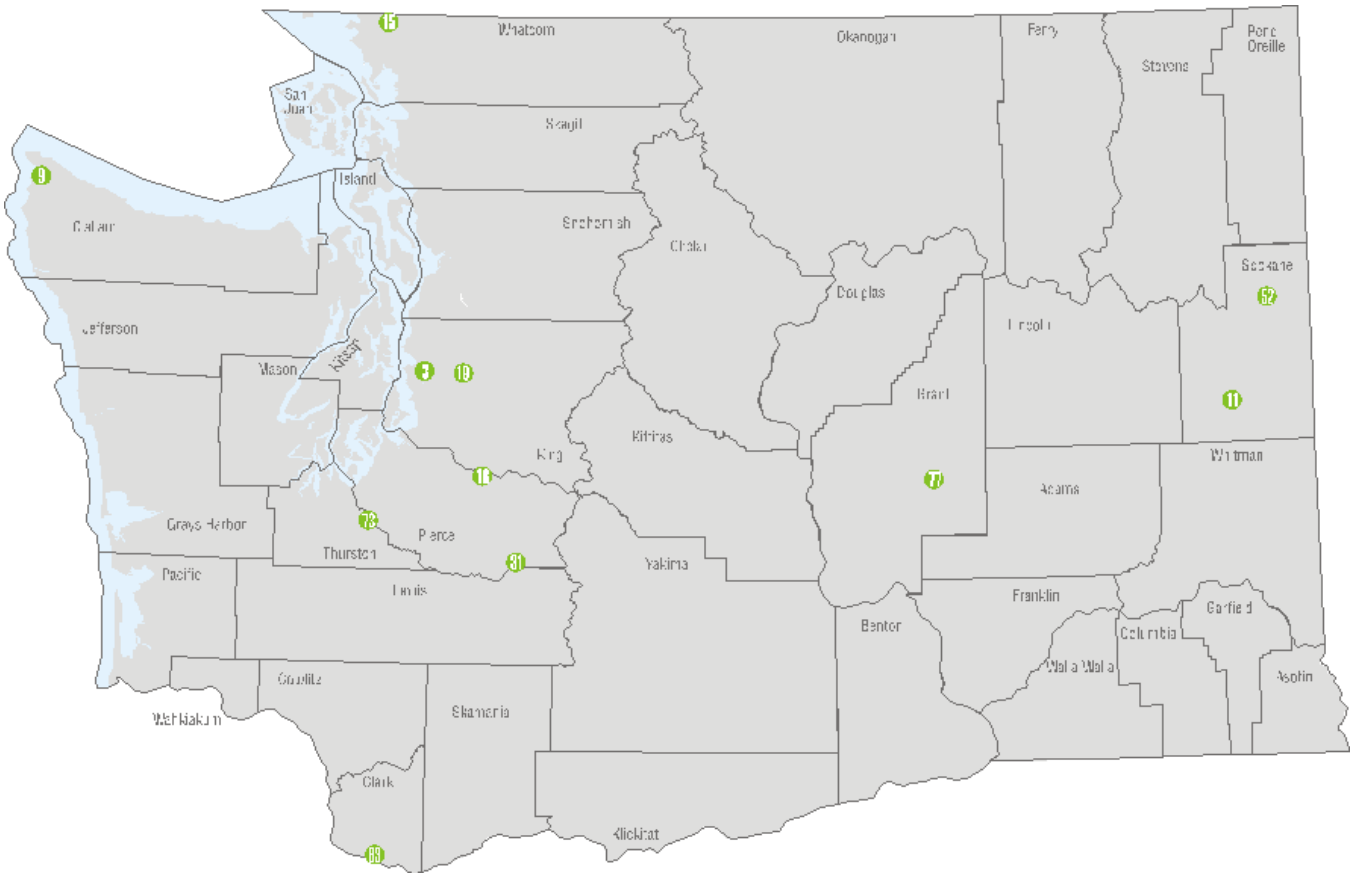


Figure 3. Map of Washington ozone sites

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	LAT/LONG: 048 17’ 12”/124 37' 13”
Location	At Cheeka Peak
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	Not near a road
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	Research
Site type(s)	Background/Regional Transport
Monitor type(s)	Rural NCore
Instrument manufacturer and model	Teledyne-API T400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	5.5
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	21
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	0.3 to 0.6
Unrestricted airflow (degrees)	175
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	1.9
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.052

Purpose: Cheeka Peak is a rural NCore site located at the northwestern tip of Washington. It is recognized as a national transport site.

Exceedances: This site has not exceeded the 8-hour ozone standard in the past three years.

Cheney, Turnbull Wildlife Refuge

Site Name	Cheney Turnbull
AQS ID	530630001
GPS coordinates	LAT/LONG: 047 24' 55"/117 31' 49"
Location	At the Cheney National Wildlife Refuge
Address	South 26010 Smith Road, Cheney
County	Spokane
Distance to road from gaseous probe (meters)	200
Traffic count (AADT, year)	5,200 (195 2012 WSDOT)
Groundcover	Grass
Statistical Area	Spokane, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	5/99
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May-September)
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	70
Distance from trees (meters)	100+
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	3.8
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.062

Purpose: Cheney Turnbull is a background/transport scale site located at the Turnbull Wildlife Refuge, south of Spokane. It is a high-concentration and background/transport site for the Spokane area. Cheney Turnbull is a CFR-required site by population.

Exceedances: This site has not exceeded the 8-hour ozone standard in the past three years.

Custer/Loomis (NWCAA)

Site Name	Custer/Loomis
AQS ID	530730005
GPS coordinates	LAT/LONG: 048 95’ 25/-122 55’45
Location	A shelter
Address	1330 Loomis Trail Road, Custer
County	Whatcom
Distance to road from gaseous probe (meters)	67
Traffic count (AADT, year)	21,000 (I-5 2012 WSDOT)
Groundcover	Grass
Statistical Area	Bellingham, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	NWCAA
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	4/89
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May-September)
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	130
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	9
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.045

Purpose: Custer/Loomis site provides data from Georgia Basin/Canadian impacts as modeling information for the Puget Sound Ozone network.

Exceedances: This site has not exceeded the 8-hour standard for ozone in the past three years.

Enumclaw, Mud Mountain Dam

Site Name	Enumclaw, Mud Mountain Dam
AQS ID	530330023
GPS coordinates	LAT/LONG: 047 08' 28"/121 56' 09"
Location	At Mud Mountain Dam (Army Corp of Engineers)
Address	30525 SE Mud Mountain Road, Enumclaw
County	King
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	14,000 (410 2012 WSDOT)
Groundcover	Gravel and weeds
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	7/98
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May-September)
Probe height (meters)	4.3
Distance from supporting structure (meters)	0.5
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	5.7
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.066

Purpose: Mud Mountain Dam is an urban scale SLAMS established in 1998 located 30 miles east of Seattle, near Enumclaw at the end of the ozone transport zone.

Exceedances: This site has exceeded the 2008 ozone standard 3 times in the last three years. Once in 2014 and twice in 2015. Impacts from Canadian wildfires are the likely cause. Exceedances will be flagged.

Issaquah, Lake Sammamish State Park

Site Name	Issaquah, Lake Sammamish
AQS ID	530330010
GPS coordinates	LAT/LONG: 047 33' 07"/122 02' 40"
Location	At Lake Sammamish State Park
Address	20050 SE 56th (Lake Sammamish State Park), Issaquah
County	King
Distance to road from gaseous probe (meters)	440
Traffic count (AADT, year)	121,000 (I-90 2012 WSDOT)
Groundcover	Gravel, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	12/75
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May-September)
Probe height (meters)	3.5
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	2.8
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.053

Purpose: Lake Sammamish is an urban scale site established in 1975 located east of Seattle, within Lake Sammamish State Park. Lake Sammamish is a long-term ozone trends site.

Exceedances: This site has not exceeded the 8-hour standard in the past three years.

Kennewick, South Clodfelter Road (BCAA)

Site Name	Kennewick South Clodfelter Road
AQS ID	530050003
GPS coordinates	LAT/LONG: 046 20' 45"/119 24' 37"
Location	At BCAA Offices
Address	526 South Clodfelter Road, Kennewick
County	Benton
Distance to road from gaseous probe (meters)	60
Traffic count (AADT, year)	N/A
Groundcover	Ground-grass and asphalt
Statistical Area	Richland-Kennewick-Pasco, WA

Kennewick, S. Clodfelter Road Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API T400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Benton County Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	6/15
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May/September)
Probe height (meters)	7
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	9
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	N/A

Purpose: Kennewick is an urban scale site for ozone established in June of 2015. It is representative of the Kennewick/ Richland area.

Exceedances: Kennewick had four exceedances of the 2008 ozone standard since June of 2015. The Kennewick will have three years of complete data in June 2018.

Mt. Rainier, Jackson Visitor Center

Site Name	Mt. Rainier, Jackson Visitor Center
AQS ID	530530012
GPS coordinates	LAT/LONG: 046 47' 07"/121 43' 58"
Location	Mount Rainier National Park
Address	At Jackson Visitor Center
County	King
Distance to road from gaseous probe (meters)	12
Traffic count (AADT, year)	506 (706, 2012 WSDOT)
Groundcover	Asphalt, rock, snow
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	General Background
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	7/98
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May-September)
Probe height (meters)	6
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	1 Supporting structure
Distance from trees (meters)	35
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	180
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	4
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.060

Purpose: The Jackson Visitor Center site is a regional scale ozone site established in 1998.

Exceedances: This site has not exceeded the 8-hour ozone standard in the past three years.

North Bend, North Bend Way

Site Name	North Bend
AQS ID	530330017
GPS coordinates	LAT/LONG: 047 29' 23"/121 46' 24"
Location	At USFS Offices
Address	42404 SE North Bend Way, North Bend
County	King
Distance to road from gaseous probe (meters)	180
Traffic count (AADT, year)	9,600 (202, 2012 WSDOT)
Groundcover	Grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Regional Transport/Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne -API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	6/98
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May-September)
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	2.8
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.059

Purpose: North Bend Way is an urban scale site established in 1998 located outside of North Bend, 25 miles east of Seattle. North Bend typically indicates some of the highest readings in the ozone network.

Exceedances: This site has exceeded the 8-hour ozone standard once in 2015.

Seattle, Beacon Hill

Site Name	Seattle Beacon Hill
AQS ID	530330080
GPS coordinates	LAT/LONG: 047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue S., Seattle
County	King
Distance to road from gaseous probe (meters)	120
Traffic count (AADT, year)	12,700 (2012 SDOT)
Groundcover	Grass, gravel
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	General Background/Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400E
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	4/97
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	4.65
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	20
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Pyrex
Spacing from minor sources	No minor sources
Residence time for reactive gases (seconds)	15
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.045

Purpose: Beacon Hill is an urban scale NCORE site located south of downtown Seattle, within Jefferson Park/reservoir. In addition to ozone, the site is used for monitoring trace level CO, SO_2, NO_y, $PM_{2.5}$, air toxics, and speciation. Seattle Beacon Hill is also a long-term trend and research site.

Exceedances: This site has not exceeded the 8-hour standard in the past three years.

Spokane, Greenbluff

Site Name	Spokane, Greenbluff
AQS ID	530630046
GPS coordinates	LAT/LONG: 047 49' 37"/117 16' 31"
Location	At the fire station in Chattaroy, WA
Address	E. 9814 Greenbluff Road, Chattaroy
County	Spokane
Distance to road from gaseous probe (meters)	50
Traffic count (AADT, year)	20,000 (2, 2012 WSDOT)
Groundcover	Grass, gravel
Statistical Area	Spokane, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	4/90
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal, (May – September)
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	5. 7
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.061

Purpose: Greenbluff is an urban scale site located near Spokane. Greenbluff is used with Cheney to identify ozone patterns for the Spokane area. Spokane Greenbluff is a CFR population required site.

Exceedances: This site has not exceeded the 8-hour ozone standard in the past three years.

Vancouver, Blairmont HS

Site Name	Vancouver, Blairmont
AQS ID	530110011
GPS coordinates	LAT/LONG: 045 36' 37"/122 30' 59"
Location	At Blairmont High School, Vancouver
Address	1500 SE Blairmont Drive, Vancouver
County	Clark
Distance to road from gaseous probe (meters)	200
Traffic count (AADT, year)	72,000 (014, 2012 WSDOT)
Groundcover	Grass, asphalt
Statistical Area	Portland, OR – Vancouver, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	5/88
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal, (May – September)
Probe height (meters)	10
Distance from supporting structure (meters)	0.5
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	5 to small (5m fruit trees), 12 to tall (12 m conifers)
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	15
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.058

Purpose: Blairmont is an urban scale site near downtown Vancouver. The site represents the Washington portion of the Portland/Vancouver air shed and is part of the ozone maintenance planning effort of the Southwest Clean Air Agency (SWCAA).

Exceedances: This site has not exceeded the 8-hour ozone standard in the past three years.

Yelm, Northern Pacific

Site Name	Yelm – North Pacific
AQS ID	530670005
GPS coordinates	931 Northern Pacific Road, Yelm
Location	In a Trailer
Address	LAT/LONG: 046 57' 03"/122 35' 43"
County	Thurston
Distance to road from gaseous probe (meters)	230
Traffic count (AADT, year)	17,000 (507 2012 WSDOT)
Groundcover	Gravel, grass
Statistical Area	Olympia, WA
Monitor Information Pollutant, POC	
Parameter code	44201
Basic monitoring objectives(s)	NAQQS Comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 400
Method code	087
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal, (May – September)
Probe height (meters)	3
Distance from supporting structure (meters)	0.7
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	50
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	4.4
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes
Design value	0.054

Purpose: Yelm is an urban scale site originally established in 1997 and relocated in 2006. The Yelm site is located in a commercial/residential area. Yelm represents ozone transport in the South Puget Sound area.

Exceedances: This site has not exceeded the 8-hour ozone standard in the past three years.

Table 6. NO_2 Parameter Codes 42600 NOy, 42601 NO, 42612 NOy-NO						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Frequency**	**Action for 2016**
530330080	Seattle Beacon Hill	3/07	NCore	Urban	Continuous	Continue
530090013	Cheeka Peak	5/06	Rural NCore	Regional	Continuous	Continue
530330030	Seattle 10th & Weller	4/14	SLAMS	Micro	Continuous	Continue
530530024	Tacoma S. 36th	1/16	SLAMS	Micro	Continuous	Continue

Additional Monitors: None.

Recommendations/Proposed Modifications: None

Figure 4. Map of Washington NO_2 sites

Seattle, Beacon Hill

Site Name	Seattle Beacon Hill
AQS ID	530330080
GPS coordinates	LAT/LONG: 047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue South, Seattle
County	King
Distance to road from gaseous probe (meters)	120
Traffic count (AADT, year)	12,700 (2012 WSDOT)
Groundcover	Grass, gravel
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	42600, 42601, 42612, 42601, 42602, 42603
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Background
Monitor type(s)	NCore
Instrument manufacturer and model	Teledyne-API 200EU & Thermo 42C-Y
Method code	599, 574
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	2006 (NO) / 2013 (NO2) /2007 (NOy)
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	4
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	20 (NO2) 10 (NOy)
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	3.7(NO2) 5.5 (NOy)
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NO_2 NAAQS?	Yes

Purpose: Beacon Hill is an urban scale NCORE site located within Jefferson Park south of downtown Seattle. In addition to ozone, the site is used for monitoring trace level CO, SO_2, NO_y, $PM_{2.5}$, air toxics, and speciation. Seattle Beacon Hill is a long-term trend and research site.

Seattle, 10th and Weller

Site Name	Seattle, 10th and Weller
AQS ID	530330030
GPS coordinates	LAT/LONG: 047 59' 72"/122 31' 97"
Location	Adjacent to Interstate 5 in Downtown Seattle
Address	10th and Weller
County	King
Distance to road from gaseous probe (meters)	8
Traffic count (AADT, year)	18,400 (2012 WSDOT)
Groundcover	Concrete, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	42601, 42602, 42603
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Teledyne-API 200EU
Method code	599
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	4/14
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	3.2
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NO_2 NAAQS?	Yes

Purpose: Seattle 10th and Weller is an EPA-required, near-road monitoring site adjacent to I-5 in Seattle.

Exceedances: Seattle 10^{th} & Weller exceeded of the 2010 NO_2 NAAQS once in 2015.

Tacoma, S. 36th

Site Name	Tacoma S. 36th
AQS ID	530530024
GPS coordinates	LAT/LONG Est.: 047 22’ 63”/122 46’ 25”
Location	On Jenny Reed Elementary School property
Address	1802 S. 36th, Tacoma
County	Pierce
Distance to road from gaseous probe (meters)	30
Traffic count (AADT, year)	
Groundcover	Asphalt, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	42601, 42602, 42603
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	Teledyne-API 200EU
Method code	599
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	Est. 1/16
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	4
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	3.2
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NO_2 NAAQS?	Yes

Purpose: Tacoma S. 36th is an EPA-required, near-road monitoring site at Jenny Reed Elementary School, adjacent to Interstate 5 in Tacoma. Start of official operation was on January 1, 2016.

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	LAT/LONG: 048 17' 12"/124 37' 13"
Location	At Cheeka Peak
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	Not near a road
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	42600, 42601, 42612
Basic monitoring objectives(s)	Research/
Site type(s)	Background/Rural Transport
Monitor type(s)	Rural NCore
Instrument manufacturer and model	Teledyne-API T200U
Method code	599
FRM/FEM/ARM/other	FEM
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	5.5
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	21
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	0.3 to 0.6
Unrestricted airflow (degrees)	175
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	1.6
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NO_2 NAAQS?	Yes

Purpose: Cheeka Peak is a rural NCore site located at the northwestern tip of Washington. It is recognized as a national transport site.

Table 7. SO_2 Parameter Code 42401						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Frequency**	**Action for 2016**
530330080	Seattle Beacon Hill	3/07	NCore	Urban	Continuous	Continue
530090013	Cheeka Peak	5/06	Rural NCore	Regional	Continuous	Continue
TBD	Mountain View Rd.	1/17	SLAMS	Neighborhood	Continuous	Establish
TBD	Kickerville Rd.	1/17	SLAMS	Neighborhood	Continuous	Establish
TBD	Malaga-Rock Island	1/17	SLAMS	Neighborhood	Continuous	Establish

Additional Monitors: Three new SO_2 monitors at two aluminum smelters will be established during 2016 and operational on January 1, 2017. These monitors are required under EPA's Data Requirement Rule
(DRR).

Recommendations/Proposed Modifications: None.

Figure 5. Map of Washington SO_2 sites

Seattle, Beacon Hill

Site Name	Seattle Beacon Hill
AQS ID	530330080
GPS coordinates	LAT/LONG: 047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue South, Seattle
County	King
Distance to road from gaseous probe (meters)	120
Traffic count (AADT, year)	12,700 (2012 WSDOT)
Groundcover	Grass, gravel
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	42401
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	NCore
Instrument manufacturer and model	API T100U
Method code	560
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	2006
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	4.65
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	20
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	15
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the SO_2 NAAQS?	Yes

Purpose: Beacon Hill is an urban scale NCORE site located within Jefferson Park south of downtown Seattle. This site is used for monitoring trace level CO, SO_2, NO_y, $PM_{2.5}$, air toxics, and speciation. Seattle Beacon Hill is also a long-term trend and research site.

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	LAT/LONG: 048 17’ 12”/124 37' 13”
Location	At Cheeka Peak
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	Not near a road
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	42401
Basic monitoring objectives(s)	Research
Site type(s)	Background/Regional Transport
Monitor type(s)	Rural NCore
Instrument manufacturer and model	Teledyne-API T100U
Method code	600
FRM/FEM/ARM/other	FEM
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	5.5
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	21
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	0.3 to 0.6
Unrestricted airflow (degrees)	175
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	5.8
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the SO_2 NAAQS?	Yes

Purpose: Cheeka Peak is a rural NCore site located at the northwestern tip of Washington. It is recognized as a national transport site.

Mountain View Road, Ferndale

Site Name	Mountain View Road, Ferndale
AQS ID	TBD
GPS coordinates	LAT/LONG: 48 50’ 53” 122 41’ 20”
Location	1 km East of Intalco
Address	4050 Mountain View Road, Ferndale
County	Whatcom
Distance to road from gaseous probe (meters)	30
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	42401
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	API T100
Method code	560
FRM/FEM/ARM/other	FEM
Collecting Agency	Intalco
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/2017
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	55
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	TBD
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the SO_2 NAAQS?	Yes

Purpose: Monitoring ambient SO_2 concentrations for determination of NAAQS attainment.

Kickerville Road, Ferndale

Site Name	Kickerville Road, Ferndale
AQS ID	TBD
GPS coordinates	LAT/LONG: 48 51’ 19” 122 42’ 17”
Location	1 km North of Intalco
Address	6036 Kickerville Road, Ferndale
County	Whatcom
Distance to road from gaseous probe (meters)	80
Traffic count (AADT, year)	N/A
Groundcover	Low shrubs, grasses
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	42401
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	API T100
Method code	560
FRM/FEM/ARM/other	FEM
Collecting Agency	Intalco
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/2017
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	TBD
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	TBD
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the SO_2 NAAQS?	Yes

Purpose: Monitoring ambient SO_2 concentrations for determination of NAAQS attainment.

Malaga-Rock Island Dam Road, Wenatchee

Site Name	Malaga-Rock Island Dam Road
AQS ID	TBD
GPS coordinates	LAT/LONG: 47 20’ 40” 120 54’ 40”
Location	2.2 Miles SE of ALCOA Wenatchee
Address	8100 Malaga Alcoa Highway, Rock Island
County	Chelan
Distance to road from gaseous probe (meters)	80
Traffic count (AADT, year)	N/A
Groundcover	Low shrubs, grass, gravel
Statistical Area	Not in a CBMSA
Monitor Information Pollutant, POC	
Parameter code	42401
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	API T100
Method code	560
FRM/FEM/ARM/other	FEM
Collecting Agency	Alcoa
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/2017
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Continuous, year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	15
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the SO_2 NAAQS?	Yes

Purpose: Monitoring ambient SO_2 concentrations for determination of NAAQS attainment.

Table 8. PM_{10}, Parameter Code 81102						
AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2016
530650005	Colville, E. 1st	10/15	SLAMS	Neighborhood	Continuous	Continue
530050002	Kennewick, Metaline Ave.	10/94	SLAMS	Neighborhood	Continuous	Continue
530630021	Spokane, Augusta Ave.	3/09	SLAMS	Middle	Continuous	Continue
530770009	Yakima, S. 4th	4/00	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors: None.

Recommendations/Proposed Modifications: Yakima was converted to a PM_{10} FEM. Note design value information below.

Thurston County Maintenance Area (Lacey $PM_{2.5}$)

The Lacey College Street $PM_{2.5}$ nephelometer site (530670013) is being used to assure continued compliance with the PM_{10} NAAQS as well as to confirm the Thurston County Maintenance Area (TCMA) continues to meet the qualification criteria of EPA's LMP approach.

A 5-year NPM_{10} design value below 98µg/m^3 demonstrates the TCMA continues to qualify for the LMP approach. The Lacey-College Street nephelometer site's (53670013) 5-year PM_{10} design value estimate for 2011–2015 was 43 µg/m^3. The PM_{10} design value estimate for 2013–2015 was 42 µg/m^3. The current design value estimates demonstrate the TCMA complies with the PM_{10} standard and continues to meet EPA's LMP qualification criteria.

Kent, Seattle, and Tacoma PM_{10} Maintenance Areas

Three- and five-year design values for the Kent, Seattle, and Tacoma PM_{10} Maintenance Areas were calculated using the table lookup method and the statistical fit method outlined in the LMP guidance document.

A 3-year PM_{10} design value of 150 µg/m^3 or below demonstrates continued compliance with the PM_{10} NAAQS. A 5-year design value below 98 µg/m^3 is required to qualify for the LMP approach. Design values calculated using the table lookup method fall within the range of uncertainty of the statistical fit method. Because they are the most conservative values, only the statistical fit values are presented here.

The $PM_{2.5}$ FEM TEOM at James Street and Central Avenue (530332004) is used to assure continued compliance with the PM_{10} NAAQS and to confirm continued eligibility for the LMP approach. The 2015 5-year design value is 48±3 µg/m^3 and the 3-year design value is 49±2 µg/m^3.

The $PM_{2.5}$ FEM TEOM at Seattle-Duwamish (530330057) is used to assure continued compliance with the PM_{10} NAAQS and to confirm continued eligibility for the LMP approach. The 2015 5-year design value is 57±6 µg/m^3 and the 3-year design value is 59±6 µg/m^3. Note: In 2014, there was not a complete year of data due to site relocation. The design values for Duwamish were calculated using the guidelines for incomplete data outlined in Appendix B, page B-1, of the PM_{10} SIP Development Guide.

The $PM_{2.5}$ Nephelometer at Tacoma-Alexander Avenue (530530031) is used to assure continued compliance with the PM_{10} NAAQS and to confirm continued eligibility for the LMP approach. The 2015 5-year design value is 66±16 µg/m^3 and the 3-year design value is 68±23 µg/m^3.

Spokane County Maintenance Area (Spokane PM_{10})

The Spokane County Maintenance area design value is based on FRM and FEM 24-hour PM_{10} monitoring data from the Augusta Avenue site (530630021) in Spokane. The LMP Guidance directs the design value be based on the most recent five years' of data. The most recent five years' of data is from 2011–2015 using a combination of FRM and FEM data from the Augusta site.

A 5-year PM_{10} design value below 98 µg/m^3 demonstrates the Spokane County Maintenance Area continues to qualify for the LMP approach. The 5-year PM_{10} design value estimate for 2010–2014 was 80 µg/m^3. For the 3-year compliance with the PM_{10} NAAQS, the form of the standard is the number of 24-hour exceedances of 150 µg/m^3, averaged over three years. The 2015 PM_{10} design value for Augusta Avenue (530630021) is 0.4. This design value is in attainment with the standard, which is not to exceed one. However, reroofing caused the monitor to be shut down for July 17 through September 18. Data capture for the third quarter was only 30 percent. The Spokane County Maintenance Area complies with the PM_{10} NAAQS and continues to meet EPA's LMP qualification criteria.

Figure 6. Map of Washington PM_{10} sites

Colville, E. 1st

Site Name	Colville, E. 1st
AQS ID	530650005
GPS coordinates	LAT/LONG: 048 54' 69"/117 90' 32"
Location	Rooftop of Colville Fire Department
Address	261 E. 1st Street, Colville
County	Stevens
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, cement, grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	81102
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo TEOM
Method code	079
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/96 est. Relocated 10/15
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	15
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	535
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	Relocated due to an unexpected eviction
Is it suitable for comparison against the PM_{10} NAAQS?	Yes
Design value	N/A

Purpose: Colville E. 1st is a neighborhood scale site for PM_{10} established in 1996 and relocated in 2015. The Colville site is located in a commercial/residential area on the roof of the Colville fire station. Colville was relocated from the rooftop of the Stevens County Courthouse to the Colville fire station.

Exceedances: Colville has exceeded the standard for PM_{10} twice in 2015.

Kennewick, Metaline Avenue (BCAA)

Site Name	Kennewick, Metaline Avenue
AQS ID	530050002
GPS coordinates	LAT/LONG: 046 13' 06"/119 12' 03"
Location	Rooftop of the Kennewick Skills Center
Address	5929 West Metaline, Kennewick
County	Benton
Distance to road from gaseous probe (meters)	84
Traffic count (AADT, year)	N/A
Groundcover	Rooftop- asphalt, ground-grass and asphalt
Statistical Area	Richland-Kennewick-Pasco, WA

Kennewick, Metaline Avenue Monitor Information Pollutant, POC	
Parameter code	81102
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo TEOM
Method code	079
FRM/FEM/ARM/other	FEM
Collecting Agency	Benton County Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/94
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	7
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	18
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	66
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	6
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the PM_{10} NAAQS?	Yes
Design value	1.6 (0.4)

Purpose: Kennewick is a neighborhood scale site for PM_{10} established in 1994 and located in the downtown Kennewick area. It is representative of Kennewick and the surrounding area which is subject to windblown dust.

Exceedances: This site has exceeded the standard for PM_{10} three times in 2015. Ecology is flagging all three 2015 exceedances and has plans to submit demonstrations on two of them.

Spokane, Augusta Avenue (SRCAA)

Site Name	Spokane, Augusta Avenue.
AQS ID	530630021
GPS coordinates	LAT/LONG: 047 39' 39"/117 21' 26"
Location	Rooftop of the Spokane Region Clean Air Agency
Address	3104 E. Augusta Avenue, Spokane
County	Spokane
Distance to road from gaseous probe (meters)	27
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof, asphalt
Statistical Area	Spokane, WA
Monitor Information Pollutant, POC	
Parameter code	81102
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS - Collocated
Instrument manufacturer and model	Thermo TEOM
Method code	079
FRM/FEM/ARM/other	FEM/FRM
Collecting Agency	Spokane Region Clean Air Agency
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Middle
Monitoring start date	3/09
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	0.5
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the PM_{10} NAAQS?	Yes
Design value	0.35

Purpose: Augusta Avenue is a middle scale site for PM_{10} located in a commercial area of Spokane. The site is representative of the Spokane area, which has been a past PM_{10} nonattainment area.

Exceedances: There was one exceedance of the 24-hour PM_{10} standard (2013) in the last three years.

Yakima, South 4th (YRCAA)

Site Name	Yakima, South 4th
AQS ID	530770009
GPS coordinates	LAT/LONG: 046 35' 42"/120 30' 44"
Location	Rooftop of Yakima Comprehensive Mental Health
Address	402 South 4th Avenue, Yakima
County	Yakima
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof, cement
Statistical Area	Yakima, WA
Monitor Information Pollutant, POC	
Parameter code	81102
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo TEOM
Method code	079
FRM/FEM/ARM/other	FEM
Collecting Agency	Yakima Region Clean Air Agency
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	4/00, TEOM FEM 9/15
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2 rooftop, 12 ground
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	7
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	34
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the PM_{10} NAAQS?	Yes
Design value	0

Purpose: South 4th is a neighborhood scale site for PM_{10} located in a commercial/residential area near downtown. The site is representative of the Yakima area, a past PM_{10} nonattainment area.

Exceedances: This site has not exceeded standard for PM_{10} in over 10 years.

Table 9. $PM_{2.5}$, Parameter Codes 88101, 88502						
AQS#	**Site Name**	**Est.**	**Type**	**Sample Type**	**Sampling Frequency**	**Action for 2016**
530272002	Aberdeen Division St.	8/02	SLAMS	Continuous	Continuous	Continue
530330037	Bellevue, Bellevue Way	4/02	SLAMS	Continuous	Continuous	Continue
530730015	Bellingham, Yew St.	11/12	SLAMS	Continuous	Continuous	Continue
530350007	Bremerton Spruce	5/12	SLAMS	Continuous	Continuous	Continue
530030004	Clarkston	3/07	SLAMS	Continuous	Continuous	Continue
530410004	Chehalis	12/09	SLAMS	Continuous	Continuous	Continue
530090013	Cheeka Peak	5/06	Rural NCore	Continuous	Continuous	Continue
530650005	Colville E. 1st	10/15	SLAMS	Continuous	Continuous	Continue
530610020	Darrington, Fir St.	12/10	SLAMS	Continuous	Continuous	Continue
530130002	Dayton, W. Main	2/09	SLAMS	Continuous	Continuous	Continue
530370002	Ellensburg	10/07	SLAMS	Continuous	Continuous	Continue
530050002	Kennewick, Metaline Ave.	8/04	SLAMS	Continuous	Continuous	Continue
530332004	Kent, James & Central	12/10	SLAMS	Continuous	Continuous	Continue
530670013	Lacey, College St.	1/02	SLAMS	Continuous	Continuous	Continue
530750005	LaCrosse, Hill St.	7/02	SLAMS	Continuous	Continuous	Continue
530330024	Lake Forest Park, Ballinger Way	1/03	SLAMS	Continuous	Continuous	Discontinued
530150015	Longview, 30th Ave.	3/03	SLAMS	Continuous	Continuous	Continue
530610005	Lynnwood, 212th	1/11	SLAMS	Continuous	Continuous	Continue
530610005	Lynnwood, 212th	9/13	SLAMS	Collocated	Continuous	Continue
530611007	Marysville, 7th Ave.	2/10	SLAMS	Continuous	Continuous	Continue
530611007	Marysville, 7th Ave.	7/12	SLAMS	Collocated	Continuous	Continue
530210002	Mesa, Pepoit Way	1/03	SLAMS	Continuous	Continuous	Continue
530251002	Moses Lake, Balsam St.	1/03	SLAMS	Continuous	Continuous	Continue
530570015	Mt. Vernon, S Second St.	8/02	SLAMS	Continuous	Continuous	Continue

Table 9. $PM_{2.5}$, Parameter Codes 88101, 88502						
AQS#	**Site Name**	**Est.**	**Type**	**Sample Type**	**Sampling Frequency**	**Action for 2016**
530330017	North Bend, North Bend Way	3/03	SLAMS	Continuous	Continuous	Continue
530090016	Port Angeles, E. 5th St.	4/15	SLAMS	Continuous	Continuous	Continue
530310003	Port Townsend, San Juan Ave.	02/01	SLAMS	Continuous	Continuous	Continue
530750003	Pullman, Dexter Ave.	3/01	SLAMS	Continuous	Continuous	Continue
530531018	Puyallup, 128th St.	1/03	SLAMS	Continuous	Continuous	Continue
530010003	Ritzville, Alder St.	3/01	SLAMS	Continuous	Continuous	Continue
530750006	Rosalia, Josephine St.	6/02	SLAMS	Continuous	Continuous	Continue
530330080	Seattle, Beacon Hill	2/10	NCore	SEQ/Cont.	1/3	Continue
530330057	Seattle, E Marginal Way	12/09	SLAMS	Continuous	Continuous	Continue
530330030	Seattle 10th & Weller	6/14	SLAMS	Continuous	Continuous	Continue
530450007	Shelton, W. Franklin	4/11	SLAMS	Continuous	Continuous	Continue
530630021	Spokane, Augusta	3/13	SLAMS	Continuous	Continuous	Continue/ FRM Discontinued
530630047	Spokane, Monroe St.	7/03	SLAMS	Continuous	Continuous	Continue
530770005	Sunnyside, S. 16th	9/15	SLAMS	Continuous	Continuous	Continue
	Tacoma 36th	1/16	SLAMS	Continuous	Continuous	Continue
530530031	Tacoma, Alexander Ave.	1/03	SLAMS	Continuous	Continuous	Continue
530530029	Tacoma, S. L St.	1/10	SLAMS	SEQ/Cont.	1/1	Continue
530530029	Tacoma, S. L St.	4/12	Co-loc	SEQ/Cont.	1/12	Continue
530110024	Vancouver NE 84th	12/14	SLAMS	FEM	Continuous	Continue
530710005	Walla Walla, 12th St.	1/02	SLAMS	Continuous	Continuous	Continue
530070011	Wenatchee Fifth St.	12/12	SLAMS	Continuous	Continuous	Continue
530110022	Yacolt, Yacolt Rd.	6/07	SLAMS	Continuous	Continue	Continue
530770009	Yakima, S 4th Ave.	5/00 0/11	SLAMS	SEQ/Cont.	1/3	Continue

Additional Monitors: A new $PM_{2.5}$ monitor (nephelometer) was established in Sunnyside in 2015.

Recommendations/Modifications: Per the recommendations of the 2015 Washington 5-Year Assessment, $PM_{2.5}$ BAM 1020 monitors were installed in Spokane, Vancouver and Yakima and the $PM_{2.5}$ FRM sampler was discontinued on 3/31/2016. ORCAA has delayed relocation of the Aberdeen site until 2018. Puget Sound Clean Air Agency (PSCAA) lost the lease at Lake Forest Park and the site was discontinued on 2/29/2016. During the winter of 2014 and 2015, PSCAA performed a mobile nephelometer study in the Shoreline, Lake Forest Park, and Lynnwood communities. Mobile studies indicated some locations in Shoreline that would be able to replace the LFP monitor for calling burn bans in North King County. PSCAA has had discussions with the Shoreline school district, and have not made very much progress. Discussions with other entities within Shoreline are planned. The schedule is to have a monitoring site location identified by the end of August 2016, and then have a monitoring site installed by 11/01/2016. An FRM was sited at Sunnyside on a 1/3 schedule during the heating season of 2015/2016 (10/03/2015 – 3/31/2016) to establish a correlation for the nephelometer.

Notes: Nephelometers are not EPA equivalent method instruments and design values are estimates. Ecology uses WAQA for reporting $PM_{2.5}$ to inform and protect citizens of Washington. Ecology's goal is to keep 24-hour concentrations below $20\mu g/m^3$. Some monitors in areas of Washington are <u>not</u> intended to be solely NAAQS based. Selected monitors are used for protection of human health by calling burn bans during home heating season, making daily decisions for agricultural burning and health information- reporting $PM_{2.5}$ values.

Ecology and its partners do not operate any seasonal $PM_{2.5}$ monitors.

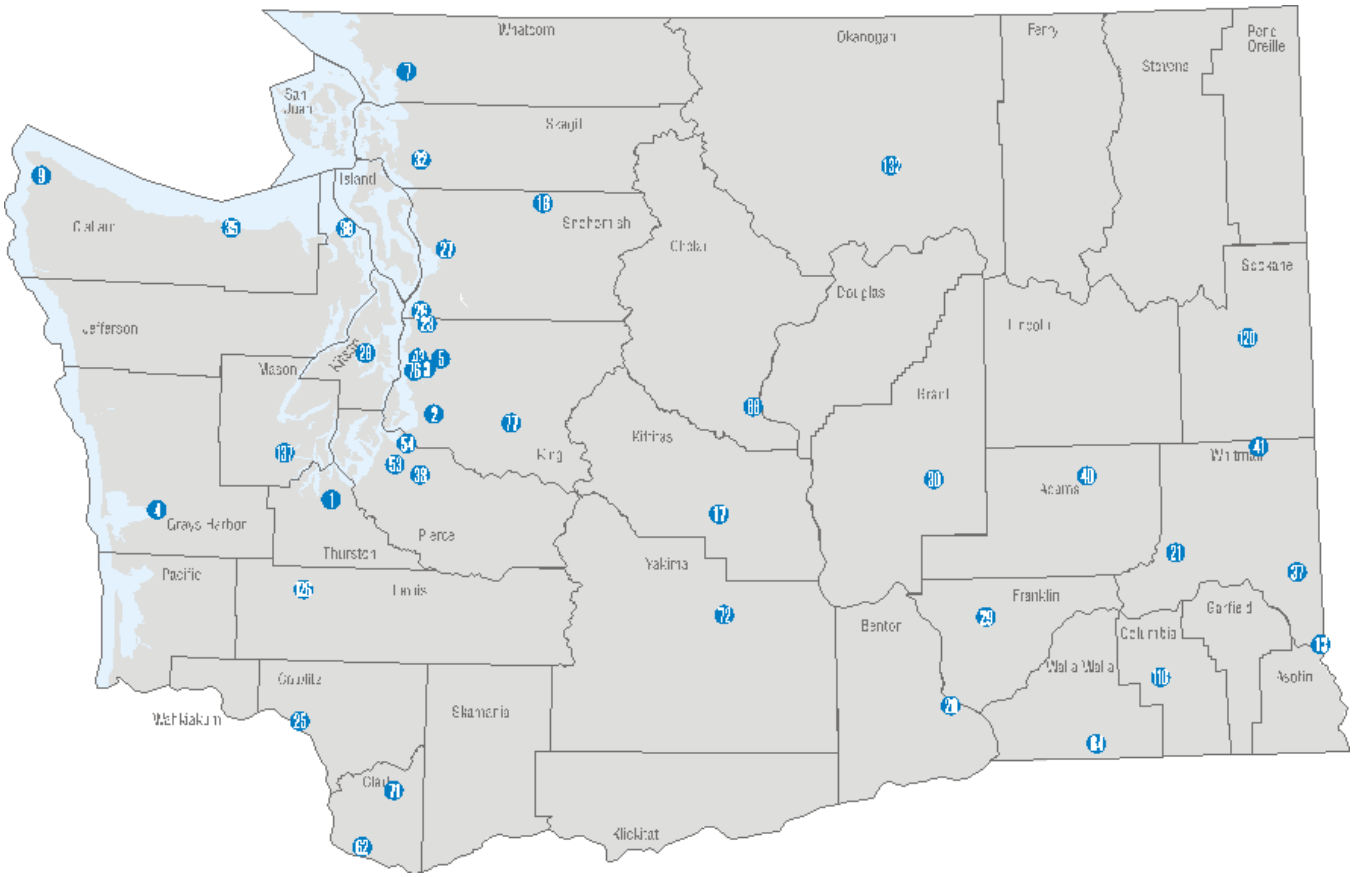


Figure 7. Map of Washington $PM_{2.5}$ sites

Aberdeen, Division Street (ORCAA) - Relocation delayed

Site Name	Aberdeen Division Street
AQS ID	530272002
GPS coordinates	LAT/LONG: 046 58' 21"/123 49' 54"
Location	At Harbor High School
Address	359 North Division, Aberdeen
County	Grays Harbor
Distance to road from gaseous probe (meters)	40 feet
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/02
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10 from ground 2 from roof
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	Relocation in 2016/2017
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Aberdeen is a neighborhood scale site. The site represents impacts to Aberdeen and the immediate Grays Harbor area from smoke related to home heating and mobile sources. It is used for curtailment calls during home heating season.

Bellevue, Bellevue Way

Site Name	Bellevue, Bellevue Way
AQS ID	530330037
GPS coordinates	LAT/LONG: 047 36' 47"/122 12' 06"
Location	Rooftop of Alvin Goldfarb Jewelers
Address	305 Bellevue Way, Bellevue
County	King
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Paved, asphalt and concrete
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	4/02
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	2
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	30
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	Planning for site relocation in 2017
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.2/24hr 14

Purpose: Bellevue Way is a neighborhood scale site. It is representative of mobile source and smoke impacts in the area and used for curtailment calls during home heating season.

Bellingham, Yew Street (NWCAA)

Site Name	Bellingham, Yew Street
AQS ID	530730025
GPS coordinates	LAT/LONG: 048 45' 46"/122 26' 25"
Location	Rooftop of 7-11
Address	2412 Yew Street, Bellingham
County	Whatcom
Distance to road from gaseous probe (meters)	30
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof, asphalt
Statistical Area	Bellingham, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 1405F
Method code	581
FRM/FEM/ARM/other	FEM
Collecting Agency	NWCAA
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	9/88 established, 11/12 FEM installed
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	Annual 7.0/24hr 18

Purpose: Bellingham Yew Street is a neighborhood scale site. It is impacted by smoke related to home heating in the Bellingham/Whatcom County area and used for curtailment calls during home heating season.

Bremerton, Spruce Avenue (PSCAA)

Site Name	Bremerton, Spruce
AQS ID	530350007
GPS coordinates	LAT/LONG: 047 59' 26"/122 62' 73"
Location	A shelter
Address	3250 Spruce Avenue, Bremerton
County	Kitsap
Distance to road from gaseous probe (meters)	100
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Bremerton, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 8500C
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	5/12
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2.5
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	150
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	Annual 4.8/24hr 13

Purpose: Bremerton Spruce is a neighborhood scale site. This site provides air quality information to a population of 280,000 Kitsap County residents.

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	LAT/LONG: 048 17' 12"/124 37' 13"
Location	At Cheeka Peek
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	7
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Research
Site type(s)	Background/Regional Transport
Monitor type(s)	Rural NCore
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	5.5
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	21
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	0.3 to 0.6
Unrestricted airflow (degrees)	175
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 2.3/24hr 6

Purpose: Cheeka Peak is a regional scale NCore site established in 2006. It is a national transport site.

Chehalis, Market Boulevard

Site Name	Chehalis, Market Boulevard
AQS ID	530410004
GPS coordinates	LAT/LONG: 046 6640"/122 96' 73"
Location	Rooftop
Address	350 North Market, Chehalis
County	Lewis
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	12/09
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	12
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	11
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	25
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.5/24hr 19

Purpose: Chehalis is a neighborhood scale site established in late 2009. It is located in a mixed commercial/residential area of Chehalis. It is impacted by smoke from home heating and used for curtailment calls during home heating season.

Clarkston, STP

Site Name	Clarkston, STP
AQS ID	530030004
GPS coordinates	LAT/LONG: 046 25' 32"/117 3' 35"
Location	At the Clarkston sewage treatment plant
Address	13th Street and Port Way, Clarkston
County	Asotin
Distance to road from gaseous probe (meters)	150
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	6/93 established, 3/07 nephelometer installed
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Clarkston is a neighborhood scale site established in 1993 as a PM_{10} site and converted to $PM_{2.5}$ in 2007. It is located in a mixed/residential area of Clarkston at the sewage treatment plant.

Colville, E. 1st

Site Name	Colville, E. 1st
AQS ID	530650005
GPS coordinates	LAT/LONG: 048 54' 46"/117 90' 32"
Location	Rooftop of the Colville Firehouse
Address	261 E. 1st Street, Colville
County	Stevens
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, Cement, grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	12/96 est. 1/02 Neph, 10/15 Relocation
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	15
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	50+
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A

Purpose: Colville E. 1st is a neighborhood scale site for $PM_{2.5}$ originally established in 1996 as a PM_{10} site and converted to $PM_{2.5}$ in 2009 and relocated in 2015. It is located in the commercial/residential area of Colville on the roof of the Colville Firehouse.

Darrington, Fir Street (PSCAA)

Site Name	Darrington, Fir Street
AQS ID	530610020
GPS coordinates	LAT/LONG: 048 14' 49"/121 36' 11"
Location	A shelter
Address	1085 Fir Street, Darrington
County	Snohomish
Distance to road from gaseous probe (meters)	120
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 8500C
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	6/07 established, 12/10 FEM
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2.5
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	25 - Building
Distance from trees (meters)	200
Distance to furnace or incinerator flue (meters)	200
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.5/24hr 29

Purpose: Darrington is a neighborhood scale site. Located in a residential area, it is impacted by smoke from home heating.

Exceedances: Darrington exceeded the 2012 $PM_{2.5}$ NAAQS three times in 2015.

Dayton, 206 West Main

Site Name	Dayton
AQS ID	530130002
GPS coordinates	LAT/LONG: 046.3180"/117.9850
Location	Shelter next to firehouse
Address	206 West Main, Dayton
County	Columbia
Distance to road from gaseous probe (meters)	33
Traffic count (AADT, year)	N/A
Groundcover	Gravel, asphalt
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	2/09
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	6
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.1/24hr 15

Purpose: Dayton is a neighborhood scale small-community site. It is impacted by smoke from burning activities in the area. Site data is used for curtailment calls and burn/no burn calls during agricultural burning seasons.

Ellensburg, Ruby Street

Site Name	Ellensburg, Ruby Street
AQS ID	530370002
GPS coordinates	LAT/LONG: 046 59' 37"/120 32' 42"
Location	Rooftop of Hal Holms Library
Address	201 North Ruby Street, Ellensburg
County	Kittitas
Distance to road from gaseous probe (meters)	33
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, cement
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 1405F FEM
Method code	581
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/95 established, 10/07 Neph, 11/14 FEM
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	Met One BAM 1020 testing in 2016/2017
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Ellensburg is a neighborhood scale site established in 1995 as a PM_{10} site and converted to $PM_{2.5}$ in 2007. Upgraded to an FEM in November 2014. It is located in a residential area of Ellensburg and impacted by smoke from home heating devices. This site is used for curtailment calls during home heating season.

Exceedances: Ellensburg exceeded the 2012 24-hour $PM_{2.5}$ NAAQS once in 2015.

Kennewick, Metaline Avenue (BCAA)

Site Name	Kennewick, Metaline Avenue
AQS ID	530050002
GPS coordinates	LAT/LONG: 046 13' 06"/119 12' 03"
Location	Rooftop of Kennewick Skills Center
Address	5929 West Metaline, Kennewick
County	Benton
Distance to road from gaseous probe (meters)	84
Traffic count (AADT, year)	N/A
Groundcover	Rooftop-asphalt, ground grass and asphalt
Statistical Area	Richland, Kennewick, and Pasco, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Benton Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/04
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	7
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	18
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	66
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	6
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Kennewick is a neighborhood scale site. The site is impacted from smoke from home heating devices and agricultural sources, and is geographically representative of the Tri-Cities area. Kennewick is used for curtailment calls during home heating season.

Kent, James, and Central (PSCAA)

Site Name	Kent, James and Central
AQS ID	530332004
GPS coordinates	LAT/LONG: 047 23' 10"/122 13' 55"
Location	A shelter
Address	614 North Railroad, Kent
County	King
Distance to road from gaseous probe (meters)	25
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, landscaping
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101(POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 8500c FEM
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	7/87 established, 12/10 FEM
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2.5
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	120
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	Annual 6.7/24hr 24

Purpose: Kent is a neighborhood scale site. It is impacted from mobile sources, light industry, and smoke from home heating devices. This site is representative of Kent and the Kent Valley area.

Exceedances: Kent exceeded the 2012 24-hour $PM_{2.5}$ NAAQS twice in 2015.

Lacey, College Street (ORCAA)

Site Name	Lacey, College Street
AQS ID	530670013
GPS coordinates	LAT/LONG: 047 01' 43"/122 49' 15"
Location	At Mountain View Elementary School
Address	1900 College Street SE, Lacey
County	Thurston
Distance to road from gaseous probe (meters)	40
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Olympia, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Ecotech M90003/1000G
Method code	812
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/02
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10 from ground
Distance from supporting structure (meters)	2
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.9/24hr 25

Purpose: Lacey, College Street is a neighborhood scale site. It is impacted by smoke from home heating devices. The site is representative of the Lacey/Olympia/Thurston County area. The monitor at this site is also used to determine compliance with the PM_{10} NAAQS as well as documenting the area continues to qualify for EPA's LMP option.

LaCrosse, Hill Street

Site Name	LaCrosse, Hill Street
AQS ID	530750005
GPS coordinates	LAT/LONG: 046 48' 55"/117 52' 26"
Location	Rooftop
Address	100 Hill Street, LaCrosse
County	Whitman
Distance to road from gaseous probe (meters)	100
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	7/02
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.2/24hr 17

Purpose: LaCrosse is a neighborhood scale small-community site. It is impacted by smoke from burning. LaCrosse is used for making agricultural burn/no-burn decisions and curtailment calls during home heating season. It also provides modeling and mapping information.

Lake Forest Park, Ballinger Way - DISCONTINUED (PSCAA)

Site Name	Lake Forest Park, Ballinger Way
AQS ID	530330024
GPS coordinates	LAT/LONG: 047 45' 18"/122 16' 50"
Location	Rooftop at the strip mall
Address	17171 Bothell Way NE, Lake Forest Park
County	King
Distance to road from gaseous probe (meters)	200
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof, asphalt
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Ecotech M9003/1000G
Method code	812
FRM/FEM/ARM/other	Other
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	3/99 established, 1/03 nephelometer installed
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2.5 rooftop 35 from ground
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	40
Distance to furnace or incinerator flue (meters)	20
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	Lease was lost. Site terminated on 2/29/2016
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 7.7/24hr 25

Purpose: Lake Forest Park is a neighborhood scale site. It is impacted by smoke from home heating devices and mobile sources from two adjacent arterials. It is used for curtailment calls during home heating season.

Longview, 30th Avenue (SWCAA)

Site Name	Longview, 30th Avenue
AQS ID	530150015
GPS coordinates	LAT/LONG: 046 08' 22"/122 57' 43"
Location	at Olympic Middle School
Address	1324 30th Avenue, Longview
County	Cowlitz
Distance to road from gaseous probe (meters)	18
Traffic count (AADT, year)	N/A
Groundcover	Grass, asphalt
Statistical Area	Longview, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Southwest Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	3/03
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	0.5
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.2/24hr 19

Purpose: Longview is a neighborhood scale site. It is impacted by smoke from home heating. It is representative of the Longview/Kelso area and used for curtailment calls during home heating season.

Lynnwood, 212th Street (PSCAA)

Site Name	Lynnwood, 212th Street
AQS ID	530610005
GPS coordinates	LAT/LONG: 047 48' 23"/122 19' 00"
Location	at Snohomish PUD
Address	6120 212th Street SW, Lynnwood
County	Snohomish
Distance to road from gaseous probe (meters)	40
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3 & 4)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo FEM
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/11 FEM
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	4
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	1 rails
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	50
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	2
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	Annual 6.1/24hr 22

Purpose: Lynnwood is a neighborhood scale site. It is impacted by smoke during home heating season. Lynnwood is representative of Lynnwood and South Snohomish County.

Exceedances: Lynnwood had one exceedance of the 2012 $PM_{2.5}$ 24-hour NAAQS in 2015.

Marysville, 7th Avenue (PSCAA)

Site Name	Marysville, 7th Avenue
AQS ID	530611007
GPS coordinates	LAT/LONG: 048 03' 18"/122 10' 33"
Location	at Marysville Junior High School
Address	1605 7th Avenue, Marysville
County	Snohomish
Distance to road from gaseous probe (meters)	15
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3 & 4)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo & Thermo 8500C
Method code	181 & 181
FRM/FEM/ARM/other	FEM & Collocated FEM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	9/91 established, 2/10 FEM, 7/12 FEM Collocated
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	75
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	2
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	FEM Annual 8.1/24hr 30/FEM2 30

Purpose: Marysville is a neighborhood scale site. It is impacted by smoke during home heating season, mobile sources, and light industry. Marysville is representative of Marysville and the North Snohomish County area.

Exceedances: Marysville exceeded the 24-hour $PM_{2.5}$ NAAQS seven times in 2015.

Mesa, Pepoit Way

Site Name	Mesa, Pepoit Way
AQS ID	530210002
GPS coordinates	LAT/LONG: 046 34' 32"/119 00' 25"
Location	Rooftop
Address	200 Pepiot Way, Mesa
County	Franklin
Distance to road from gaseous probe (meters)	300
Traffic count (AADT, year)	N/A
Groundcover	Grass, scrub
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/03
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	6
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	33
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.2/24hr 19

Purpose: Mesa is a neighborhood scale small-community site. It is impacted by agricultural sources and smoke from home heating. It is also used for daily agricultural burn decisions and curtailment calls during home heating season.

Moses Lake, South Balsam Street

Site Name	Moses Lake, Balsam Street
AQS ID	530251002
GPS coordinates	LAT/LONG: 047 07' 50"/119 16' 22"
Location	Rooftop
Address	412 S Balsam Street, Moses Lake
County	Grant
Distance to road from gaseous probe (meters)	25
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/03
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	6
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	2
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	25
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.8/24hr 21

Purpose: Moses Lake is a neighborhood scale, small community site. It is by agricultural sources and smoke from home heating sources. It is also used for daily agricultural burn decisions and curtailment calls during home heating season.

Mt. Vernon, South Second Street (NWCAA)

Site Name	Mt. Vernon, South Second Street
AQS ID	530570015
GPS coordinates	LAT/LONG: 048 24' 37"/122 20' 16"
Location	A room at NWCAA Offices
Address	1600 South Second Street, Mount Vernon
County	Skagit
Distance to road from gaseous probe (meters)	25
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	NWCAA
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/02
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	7
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 4.7/24hr 12

Purpose: Mt. Vernon is a neighborhood scale, small community site. It is impacted by home heating devices. Mt. Vernon is used for curtailment calls during home heating season.

North Bend, North Bend Way

Site Name	North Bend, North Bend Way
AQS ID	530330017
GPS coordinates	LAT/LONG: 047 29' 23"/121 46' 24"
Location	a shelter at USFS Offices
Address	42404 SE North Bend Way, North Bend
County	King
Distance to road from gaseous probe (meters)	180
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Seattle-Bellevue-Everett, WA
Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	3/03
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.2/24hr 14

Purpose: North Bend is a neighborhood scale transport/background $PM_{2.5}$ site. It is impacted by smoke from home heating devices. North Bend is used for curtailment calls during home heating season. North Bend is collocated with ozone and meteorological equipment.

Port Angeles, East 5th Street (ORCAA)

Site Name	Port Angeles, East 5th Street
AQS ID	530090016
GPS coordinates	LAT/LONG: 048 11' 50"/123 43' 64"
Location	At the Fire Station
Address	102 East 5th Street, Port Angeles
County	Clallam
Distance to road from gaseous probe (meters)	15
Traffic count (AADT, year)	N/A
Groundcover	Grass, asphalt
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/99 established, 4/15 relocated
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	20 from ground 2 from roof
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	No
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Port Angeles is a neighborhood scale site adjacent to Olympic National Park, a Class I area. It is impacted by smoke from home heating sources. Port Angeles is also used for curtailment calls during home heating season.

Port Townsend, San Juan Avenue (ORCAA)

Site Name	Port Townsend, San Juan Avenue
AQS ID	530310003
GPS coordinates	LAT/LONG: 048 07' 45"/122 46' 46"
Location	At Blue Herron School
Address	3939 San Juan Avenue, Port Townsend
County	Jefferson
Distance to road from gaseous probe (meters)	45
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	2/00 established, 2/01 nephelometer installed
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	30 from ground 2 from roof
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.2/24hr 15

Purpose: Port Townsend is a neighborhood scale site. It is impacted by smoke from home heating devices. Port Townsend is used for curtailment calls during home heating season. It is representative of the east Jefferson County area.

Pullman, Dexter Avenue

Site Name	Pullman, Dexter Avenue
AQS ID	530750003
GPS coordinates	LAT/LONG: 046 43' 28"/117 10' 46"
Location	At Pullman Public School
Address	240 SE Dexter, Pullman
County	Whitman
Distance to road from gaseous probe (meters)	40
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, grass
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Ecotech M9003/1000G
Method code	812
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	3/01
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	20
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.0/24hr 15

Purpose: Pullman is a neighborhood scale site. It is impacted by smoke from burning. Pullman is used for daily agricultural burn/no-burn decisions and curtailment calls during home heating season.

Puyallup, 128th Street (PSCAA)

Site Name	Puyallup, 128th Street
AQS ID	530531018
GPS coordinates	LAT/LONG: 047 08' 24"/122 18' 01"
Location	A shelter
Address	9616 128th Street East, Puyallup
County	Pierce
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Ecotech M9003/1000G
Method code	812
FRM/FEM/ARM/other	Other
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	12/91 established, 1/03 nephelometer
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	80
Distance to furnace or incinerator flue (meters)	100
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.3/24hr 23

Purpose: Puyallup is a neighborhood scale site. It is impacted by smoke from home heating devices in the Puyallup South Hill/Pierce County area.

Ritzville, Alder Street

Site Name	Ritzville, Alder Street
AQS ID	530010003
GPS coordinates	LAT/LONG: 047 07' 43"/118 22' 55"
Location	A shelter
Address	109 West Alder, Ritzville
County	Adams
Distance to road from gaseous probe (meters)	80
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, gravel
Statistical Area	Not in an urban area

Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/00 established, 3/01 nephelometer
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	8
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.3/24hr 17

Purpose: Ritzville is a neighborhood scale, small community site. It is impacted by smoke from burning activities in the area. Ritzville is used for making daily agricultural burn/no-burn decisions and curtailment calls during home heating season.

Rosalia, Josephine Street

Site Name	Rosalia, Josephine Street
AQS ID	530750006
GPS coordinates	LAT/LONG: 047 13' 52"/117 22' 08"
Location	In a building
Address	906 South Josephine Street, Rosalia
County	Whitman
Distance to road from gaseous probe (meters)	27
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 4)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	6/02
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	15 Furnace exhaust
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.4/24hr 17

Purpose: Rosalia is a neighborhood scale small-community site. It is impacted by smoke from burning in the area. Rosalia is used for making daily agricultural burning decisions and curtailment calls during home heating season.

Seattle, Beacon Hill

Site Name	Seattle, Beacon Hill
AQS ID	530330080
GPS coordinates	LAT/LONG: 047 34' 58"/122 18' 30"
Location	A shelter at Jefferson Park/reservoir
Address	4103 Beacon Avenue South, Seattle
County	King
Distance to road from gaseous probe (meters)	10
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3 & POC 1)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	NCore
Instrument manufacturer and model	Thermo 8500C FEM & Thermo 2025 FRM
Method code	181 & 118
FRM/FEM/ARM/other	Thermo 8500 FEM & 2025 FRM
Collecting Agency	Ecology
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	6/79 established, 2/10 FEM installed
Current sampling frequency	Continuous & 1/3
Calculated sampling frequency	N/A
Sampling season	Year Round
Probe height (meters)	6 FEM 3 FRM
Distance from supporting structure (meters)	2 FRM
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	2
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Pyrex
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	FEM Annual 6.3/24hr 16/FRM 18

Purpose: Seattle, Beacon Hill is an urban scale NCORE site. Seattle Beacon Hill is collocated with an FEM, FRM, meteorological parameters, as well as toxics and speciation monitoring.

Seattle, Duwamish (PSCAA)

Site Name	Seattle, East Marginal Way
AQS ID	530330057 (same)
GPS coordinates	LAT/LONG: 047 55' 99"/122 33' 82"
Location	A shelter
Address	4700 East Marginal Way
County	King
Distance to road from gaseous probe (meters)	90
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 8500C FEM
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/71 established, 12/09 FEM installed 6/2014 relocated/restarted
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	No
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	N/A*

*Insufficient data.

Purpose: Seattle Duwamish is a neighborhood scale site. It is located in the Duwamish River Valley and impacted by mobile source diesel emissions and industrial sources.

Seattle, 10th and Weller (PSCAA)

Site Name	Seattle, 10th and Weller
AQS ID	530330030
GPS coordinates	LAT/LONG: 047 59' 72"/122 31' 97"
Location	A shelter adjacent to I-5 in downtown Seattle
Address	10th and Weller
County	King
Distance to road from gaseous probe (meters)	8
Traffic count (AADT, year)	18,400 (2012 WSDOT)
Groundcover	Concrete, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	Thermo 8500C FEM
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	6/14
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	3.2
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NO_2 NAAQS?	Yes
Design value	N/A*

*Insufficient data.

Purpose: Seattle 10th and Weller is a micro scale, EPA-required, near-road monitoring site. It is located near the International District adjacent to Interstate 5.

Shelton, West Franklin (ORCAA)

Site Name	Shelton, West Franklin
AQS ID	530450007
GPS coordinates	LAT/LONG: 047 213' 55"/123 100' 81"
Location	Rooftop of the fire station
Address	122 West Franklin, Shelton
County	Mason
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	Relocated 4/11
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	30 from ground 2 from roof
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	10
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	320
Spacing from minor sources	No minor sources
Probe material for reactive gases	Tygon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.4/24hr 18

Purpose: Shelton is a neighborhood scale site. It was established in 2001 and relocated in April 2011. Shelton is impacted by smoke from home heating devices and used for curtailment calls during home heating season.

Spokane, Augusta Avenue (SRCAA)

Site Name	Spokane, Augusta Avenue
AQS ID	530630021
GPS coordinates	LAT/LONG: 047 39' 39"/117 21' 26"
Location	Rooftop of SRCAA Offices
Address	3104 E. Augusta Avenue, Spokane
County	Spokane
Distance to road from gaseous probe (meters)	27
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof, asphalt
Statistical Area	Spokane, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 5)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Met One BAM 1020
Method code	170
FRM/FEM/ARM/other	FEM
Collecting Agency	Spokane Region Clean Air Agency
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	3/09 established, 9/13 FEM, 10/15 BAM
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	FRM discontinued 3/31/2016
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	FEM N/A FRM N/A*

*Insufficient data due to construction at site.

Purpose: Spokane Augusta Avenue is a neighborhood scale site. It is impacted by smoke from home heating devices and light industrial sources.

Exceedances: Spokane Augusta exceeded the NAAQS three times in 2015.

Spokane, Monroe Street

Site Name	Spokane Monroe
AQS ID	530630047
GPS coordinates	LAT/LONG: 047 42' 03"/117 25' 30"
Location	Rooftop of the Ecology Eastern Regional Office
Address	North 4601 Monroe Street, Spokane
County	Spokane
Distance to road from gaseous probe (meters)	40
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	MSA: Spokane, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/89 established, 7/03 nephelometer
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	12
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	40
Distance to furnace or incinerator flue (meters)	20 (natural gas)
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Spokane, Monroe Street is a neighborhood scale site. It is impacted by smoke from home heating devices and is representative of the area.

Sunnyside, South 16th (YRCAA)

Site Name	Sunnyside, South 16th
AQS ID	530770005
GPS coordinates	LAT/LONG: 046 35' 42"/120 30' 44"
Location	Rooftop at Harrison Middle School
Address	810 S. 16th Street, Sunnyside
County	Yakima
Distance to road from gaseous probe (meters)	70
Traffic count (AADT, year)	N/A
Groundcover	Asphalt roof, grass & asphalt on the ground
Statistical Area	Yakima, WA
Monitor Information Pollutant, POC	
Parameter code	88101
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	Radiance Research M903*
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Yakima Region Clean Air Agency
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	9/15
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2 rooftop, 12 from ground
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A**

*An FRM was sited at Sunnyside on a 1/3 schedule during the heating season of 2015/2016 (10/03/2015 – 3/31/2016) to establish a correlation for the nephelometer.
**Insufficient data.

Purpose: Sunnyside is a neighborhood scale site. It is impacted by smoke from home heating and burning sources in the area.

Tacoma, S. 36th

Site Name	Tacoma S. 36th
AQS ID	530530024
GPS coordinates	LAT/LONG Est.: 047 22’ 63”/122 46’ 25”
Location	On Jenny Reed Elementary School property
Address	1802 S. 36th, Tacoma
County	Pierce
Distance to road from gaseous probe (meters)	30
Traffic count (AADT, year)	
Groundcover	Asphalt, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101 POC 5
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	Met One BAM 1020 FEM
Method code	170
FRM/FEM/ARM/other	FEM
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	1/16
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	4
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	3.2
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NO_2 NAAQS?	Yes

Purpose: Tacoma S. 36th is an EPA-required, near-road monitoring site at Jenny Reed Elementary School, adjacent to Interstate 5 in Tacoma. Start of official operation was on January 1, 2016. Although not EPA required, Ecology is operating a $PM_{2.5}$ Met One BAM 1020 FEM at this site.

Tacoma, Alexander Avenue (PSCAA)

Site Name	Tacoma, Alexander Avenue
AQS ID	530530031
GPS coordinates	LAT/LONG: 047 15' 56"/122 23' 09"
Location	A shelter
Address	2301 Alexander Avenue, Tacoma
County	Pierce
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Grass, gravel
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/87 established, 1/03 nephelometer
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 7.9/24hr 23

Purpose: Tacoma, Alexander Avenue is a neighborhood scale site. It is impacted by smoke from home heating devices and industrial point sources on the Tacoma Tide flats. The site is representative of the NE Tacoma/Fife area.

Tacoma, South L Street (PSCAA)

Site Name	Tacoma, L Street
AQS ID	530530029
GPS coordinates	LAT/LONG: 047 11' 11"/122 27' 06"
Location	A shelter
Address	7802 South L Street, Tacoma
County	Pierce
Distance to road from gaseous probe (meters)	100
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3 & 1)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 8500C FEM & Thermo 2025 FRM
Method code	181 & 118
FRM/FEM/ARM/other	FEM & FRM
Collecting Agency	Puget Sound Clean Air Agency
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/99 established, 1/10 FEM, 4/12 FRM
Current sampling frequency	Continuous & 1/1
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	60
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	2
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	FEM Annual 30 24hr 7.5/FRM 32

Purpose: Tacoma, L Street is a neighborhood scale site. It is impacted by smoke from home heating devices.

Exceedances: Tacoma L Street site exceeded the NAAQS five times in 2015.

Vancouver, NE 84th Avenue (SWCAA)

Site Name	Vancouver, NE 84th Avenue
AQS ID	530110024
GPS coordinates	LAT/LONG: 45.64' 33"/122 58' 73"
Location	at Water Station #15
Address	2795 NE 84th Ave, Vancouver
County	Clark
Distance to road from gaseous probe (meters)	170 meters
Traffic count (AADT, year)	8471 (2011)
Groundcover	grass
Statistical Area	Portland-Vancouver, OR-WA
Monitor Information Pollutant, POC	
Parameter code	88101, POC 5
Basic monitoring objectives(s)	NAAQS Compliance
Site type(s)	Population exposure/highest conc.
Monitor type(s)	SLAMS
Instrument manufacturer and model	Met One BAM 1020 FEM
Method code	170
FRM/FEM/ARM/other	FEM
Collecting Agency	Southwest Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	December 29, 2014, 7/2015 BAM FEM
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	0.5
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	25
Distance from trees (meters)	31
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Anodized aluminum
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	Annual 8.51/24hr 34 (Combined locations)

Purpose: Vancouver, NE 84th Avenue is a neighborhood scale site. It is impacted by smoke from home heating.

Exceedances: Vancouver exceeded the NAAQS four times in 2015.

Walla Walla, 12th Street

Site Name	Walla Walla, 12th Street
AQS ID	530710005
GPS coordinates	LAT/LONG: 046 03' 32"/118 21' 06"
Location	Rooftop
Address	200 South 12th, Walla Walla
County	Walla Walla
Distance to road from gaseous probe (meters)	25
Traffic count (AADT, year)	N/A
Groundcover	Asphalt
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	5/89 established, 10/02 nephelometer
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.37/24hr 19

Purpose: Walla Walla is a neighborhood scale small-community site. It is impacted by smoke from burning activities in the area.

Wenatchee, 5th Street

Site Name	Wenatchee 5th Street
AQS ID	530070011
GPS coordinates	LAT/LONG: 047 43' 06"/120 34' 19"
Location	A shelter at Wenatchee Valley College
Address	1300 5th Street
County	Chelan
Distance to road from gaseous probe (meters)	33
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Thermo 1405F FEM
Method code	181
FRM/FEM/ARM/other	FEM
Collecting Agency	Wenatchee
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	12/12
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	70
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	Met One BAM 1020 testing in 2016/2017
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	Annual 5.37/24hr N/A

Purpose: Wenatchee 5th is a neighborhood scale site. It is impacted by smoke from home heating and wildfires.

Exceedances: The Wenatchee monitor exceeded the 2012 $PM_{2.5}$ 24-hour standard once in 2015.

Yacolt, Yacolt Road (SWCAA)

Site Name	Yacolt, Yacolt Road
AQS ID	530110022
GPS coordinates	LAT/LONG: 045 86' 63"/122 40' 88"
Location	At Yacolt Primary School
Address	406 West Yacolt Road, Yacolt
County	Clark
Distance to road from gaseous probe (meters)	112
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, grass
Statistical Area	Vancouver, WA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Southwest Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	6/07
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	15 roof
Distance from supporting structure (meters)	0.5
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Yacolt is a neighborhood scale site. It is impacted by smoke from home heating devices and is representative of the area.

Yakima, South 4th Avenue (YRCAA)

Site Name	Yakima, South 4th Avenue
AQS ID	530770009
GPS coordinates	LAT/LONG: 046 35' 42"/120 30' 44"
Location	Rooftop at Yakima Comprehensive MH
Address	402 South 4th Avenue, Yakima
County	Yakima
Distance to road from gaseous probe (meters)	14
Traffic count (AADT, year)	N/A
Groundcover	Asphalt roof, grass & cement on the ground
Statistical Area	Yakima, WA
Monitor Information Pollutant, POC	
Parameter code	88101 (POC 5 & 1)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Met One BAM 1020 FEM & Thermo 2025
Method code	170 & 118
FRM/FEM/ARM/other	FEM & FRM
Collecting Agency	Yakima Region Clean Air Agency
Analytical Lab	Ecology
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	5/00 established, 10/11, 9/15 BAM FEM
Current sampling frequency	Continuous & 1/3
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3 rooftop, 13 from ground
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	7
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	34
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	Yes
Design value	FEM Annual 9.51 24hr 32/FRM 34

Purpose: Yakima is a neighborhood scale site. It is impacted by smoke from home heating and burning sources in the area.

Exceedances: Yakima exceeded the 24-hour $PM_{2.5}$ standard four times in 2015.

Other – contracted local clean air agencies

Table 10. Other - Contracted Local Clean Air Agencies						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Type**	**Action for 2016**
530570011	Anacortes	10/11	SLAMS	Urban	Continuous	Continue
530090013	Cheeka Peak	5/06	Rural NCore	Regional	Continuous	Continue
530630021	Spokane Augusta	5/10	SLAMS	Urban	Continuous	Discontinued

Additional Monitors: None.

Note: SRCAA discontinued ozone monitoring at Augusta for 2016. Ecology provides technical support for Anacortes and Cheeka Peak. Technical support can include repair and calibration, quality assurance, telemetry, and data management.

Anacortes, O Street (NWCAA)

Site Name	Anacortes, O Street
AQS ID	530570011
GPS coordinates	LAT/LONG: 048 52' 05"/122 61' 42"
Location	A trailer
Address	202 O Street, Anacortes
County	Skagit
Distance to road from gaseous probe (meters)	15
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, gravel
Statistical Area	MSA: Not an Urban area
Monitor Information Pollutant, POC	
Parameter code	44201, 42401, 88101 (POC 3)
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturers and model	Teledyne-API 400, Teledyne-API T100U & Thermo 8500
Method code	087, 560, 181
FRM/FEM/ARM/other	FEM
Collecting Agency	NWCAA
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/11
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Ozone seasonal (May-September), Year-round SO_2 and $PM_{2.5}$
Probe height (meters)	3
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	9.5 residence time needed
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the ozone NAAQS?	Yes. 0.042 Ozone/$PM_{2.5}$ FEM N/A*
Design Value	

*Insufficient data.

Purpose: The NWCAA uses this site to collect ozone, SO_2, and $PM_{2.5}$ information in its jurisdiction. This site is suitable for comparison to the NAAQS.

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	LAT/LONG: 048 17'12"/ 124 37' 13"
Location	A shelter at Cheeka Peak
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	7
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	42101, 42401, 42600+, 88502,
Basic monitoring objectives(s)	Research
Site type(s)	Background/Regional Transport
Monitor type(s)	NCore
Instrument manufacturer and model	Teledyne-API 400, RR M903,
Method code	087, 054, 560, 599, 771
FRM/FEM/ARM/other	FEM & Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	5.5
Distance from supporting structure (meters)	0.3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	21
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	0.3 to 0.6
Unrestricted airflow (degrees)	175
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	See specific pollutant
Changes within the next 18 months?	Potential analyzer upgrades
Is it suitable for comparison against the $PM_{2.5}$, ozone, and Trace gases NAAQS?	$PM_{2.5}$ – No, Ozone – Yes, Trace gases, Yes
Design Value	Annual 2.3 24hr 6

Purpose: The Olympic Region Clean Air Agency (ORCAA) operates this Rural NCore site.

Meteorological Monitoring (Met. 61101, 61102, 62101)

Table 11. Met Monitoring, Parameter Codes 61101, 61102, 62101						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Type**	**Action for 2016**
530090013	Cheeka Peak	5/06	WS, WD, Ta	Regional	Continuous	Continue
530650005	Colville	3/11	WS, WD, Ta	Neighborhood	Continuous	Continue
530330023	Enumclaw Mud Mtn.	2/04	WS, WD, Ta	Urban	Continuous	Continue
530050005	Kennewick	08/12	WS, WD, Ta	Neighborhood	Continuous	Continue
530330017	North Bend	1/00	WS, WD, Ta	Regional	Continuous	Continue
530470013	Omak (Tribal)	10/10	WS, WD, Ta	Neighborhood	Continuous	Continue
530330080	Seattle Beacon Hill	6/79	WS, WD, Ta	Urban	Continuous	Continue
530330030	Seattle 10th & Weller	4/14	WS, WD, Ta	Micro	Continuous	Continue
530630021	Spokane Augusta Ave	7/09	WS, WD, Ta	Neighborhood	Continuous	Continue
530530024	Tacoma 36th	2/16	WS, WD, Ta	Micro	Continuous	Continue
530531016	Tacoma Tower	1/91	WS, WD, Ta	Micro	Continuous	Continue
530770015	Toppenish (Tribal)	6/09	WS, WD, Ta	Neighborhood	Continuous	Continue
530110011	Vancouver Blairmount	12/07	WS, WD, Ta	Neighborhood	Continuous	Continue
530070011	Wenatchee Fifth	11/12	WS, WD, Ta	Neighborhood	Continuous	Continue
530770016	White Swan (Tribal)	11/09	WS, WD, Ta	Neighborhood	Continuous	Continue

Additional Monitors: A new meteorological site is anticipated at the Central Washington Comprehensive Mental Health Yakima site in 2017 pending landlord approval. The Tacoma near-road site began meteorological monitoring in February 2016.

Recommendations/Modifications: None.

Cheeka Peak (ORCAA)

Site Name	Cheeka Peak
AQS ID	530090013
GPS coordinates	048 29' 78"/124 62' 49"
Location	At Cheeka Peak
Address	Cheeka Peak
County	Clallam
Distance to road from gaseous probe (meters)	Not near a road
Traffic count (AADT, year)	N/A
Groundcover	Shrubs, grass and gravel/dirt
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Research
Site type(s)	National Transport
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 86004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Olympic Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	5/06
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	40+
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of monitoring at the Rural NCore site.

Colville, E. 1st

Site Name	Colville, E. 1st
AQS ID	530650005
GPS coordinates	048 54' 46"/117 90' 32"
Location	Rooftop of the Colville Firehouse
Address	261 E. 1st Street, Colville
County	Stevens
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, cement, grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	5/16
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	50+
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$ and PM_{10} monitoring at Colville.

Enumclaw, Mud Mountain Dam

Site Name	Enumclaw, Mud Mountain
AQS ID	530330023
GPS coordinates	047 08' 28"/121 56' 09"
Location	At Mud Mountain Dam
Address	30525 SE Mud Mountain Road, Enumclaw
County	King
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Gravel & weeds
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Regional Transport
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040, 62
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	2/04
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Seasonal (May – September)
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of seasonal ozone monitoring at Enumclaw.

Kennewick, Metaline Avenue (BCAA)

Site Name	Kennewick, Metaline Avenue
AQS ID	530050002
GPS coordinates	046 13' 06"/119 12' 03"
Location	Rooftop of Kennewick Skills Center
Address	5929 West Metaline, Kennewick
County	Benton
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Rooftop-asphalt, ground-grass & asphalt
Statistical Area	Richland, Kennewick and Pasco, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/12
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	18
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	66
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5,}$ PM_{10} and seasonal ozone monitoring in the Kennewick/TriCities area.

North Bend, North Bend Way

Site Name	North Bend, North Bend Way
AQS ID	530330017
GPS coordinates	047 29' 23"/121 46' 24"
Location	At USDA Forest Service Offices
Address	42404 SE North Bend Way, North Bend
County	King
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040, 62
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Regional
Monitoring start date	1/00
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$ and seasonal ozone monitoring at North Bend.

Omak (Colville Tribe)

Site Name	Omak (Colville Nation)
AQS ID	530470013
GPS coordinates	048. 39' 99"/119 518' 96"
Location	A mill yard
Address	8th Avenue and Omak/Okanogan Road
County	Okanogan
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Grass, dirt
Statistical Area	Not in an MSA

Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/10
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$ monitoring at Omak.

Seattle, Beacon Hill

Site Name	Seattle, Beacon Hill
AQS ID	530330080
GPS coordinates	047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue South, Seattle
County	King
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	NCore
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040, 062
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	6/79
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$, ozone, NCore, toxics and speciation monitoring at Seattle Beacon Hill.

Seattle, 10th and Weller

Site Name	Seattle, 10th and Weller
AQS ID	530330030
GPS coordinates	047 59' 72"/122 31' 97"
Location	Adjacent to I-5
Address	10th and Weller, Seattle
County	King
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Cement, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040, 062
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	4/14
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of NO_2, CO, and $PM_{2.5}$ near-road monitoring at Seattle 10th and Weller.

Spokane, Augusta Avenue (SRCAA)

Site Name	Spokane, Augusta Avenue
AQS ID	530630021
GPS coordinates	047 39' 39"/ 17 21' 26"
Location	Rooftop of Spokane Regional Clean Air Agency
Address	3104 East Augusta Avenue, Spokane
County	Spokane
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Membrane roof, asphalt
Statistical Area	Spokane, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Spokane Region Clean Air Agency
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	3/09
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction and temperature in support of $PM_{2.5}$, and PM_{10} monitoring at Spokane Augusta.

Tacoma, 36th

Site Name	Tacoma, 36th
AQS ID	530530024
GPS coordinates	LAT/LONG Est.: 047 22’ 63”/122 46’ 25”
Location	On Jenny Reed Elementary School Property
Address	1802 S. 36th
County	Pierce
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	160,000 est. (2104 WSDOT)
Groundcover	Cement, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040, 062
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	2/16
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Optional collection of wind speed, wind direction, and temperature in support of NO_2, and $PM_{2.5}$ at the Tacoma 36th near-road site.

Tacoma, Tower Drive

Site Name	Tacoma, Tower Drive
AQS ID	530531016
GPS coordinates	47.30444"/122.4120
Location	At a reservoir
Address	5225 Tower Drive, Tacoma
County	Pierce
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Gravel
Statistical Area	Seattle-Bellevue, Everett, WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Micro
Monitoring start date	1/99
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of modeling in the Puget Sound.

Toppenish, Ward Road (Yakama Nation)

Site Name	Toppenish Ward Road
AQS ID	530770015
GPS coordinates	046 23' 07"/120 18' 49"
Location	At Toppenish High School
Address	141 Ward Road, Toppenish
County	Yakima
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/08
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$ monitoring at Toppenish.

Vancouver, Blairmont

Site Name	Vancouver, Blairmont
AQS ID	530110011
GPS coordinates	045 36' 37"/122 30' 59"
Location	At Blairmont High School
Address	1500 SE Blairmount Drive, Vancouver
County	Clark
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Grass, asphalt
Statistical Area	Portland-Vancouver, OR-WA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050, 020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	12/07
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of seasonal ozone monitoring at Vancouver Blairmont.

Wenatchee, 5th Street

Site Name	Wenatchee 5th
AQS ID	530070011
GPS coordinates	047 43' 06"/120 34' 19"
Location	At Wenatchee Valley College
Address	1300 5th Street, Wenatchee
County	Chelan
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050,020,040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/12
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$ monitoring at Wenatchee.

White Swan (Yakama Nation)

Site Name	White Swan
AQS ID	530770016
GPS coordinates	046.37' 54"/120 72' 93"
Location	At Mt. Adams School
Address	621 Signal Peak Road, White Swan
County	Yakima
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	61101, 61102, 62101
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	RM Young 85004
Method code	050,020, 040
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/09
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	10
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Collection of wind speed, wind direction, and temperature in support of $PM_{2.5}$ monitoring at White Swan.

Table 12. Other Contracted Sites USFS						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Type**	**Action for 2016**
530070007	Chelan	12/02	SPMS	Neighborhood	Continuous	Discontinued
530070010	Leavenworth	2/05	SPMS	Neighborhood	Continuous	Continue
530770007	Naches	8/08	SPMS	Neighborhood	Continuous	Discontinued
530470009	Twisp	11/03	SPMS	Neighborhood	Continuous	Continue
530470010	Winthrop	11/03	SPMS	Neighborhood	Continuous	Continue

Additional Monitors: None.

Recommendations/Modifications: The USFS discontinued Ecology support for the Chelan and Naches sites.

Comment: *****Nephelometers are not EPA equivalent method, nor compliance instruments, and design values are estimates.

Leavenworth, Evans Street (USFS)

Site Name	Leavenworth, Evans Street
AQS ID	530070010
GPS coordinates	LAT/LONG: 047 35' 56"/120 39' 53"
Location	At Cascade School District property
Address	330 Evans Street, Leavenworth
County	Chelan
Distance to road from gaseous probe (meters)	10
Traffic count (AADT, year)	N/A
Groundcover	Grass, asphalt
Statistical Area	MSA: Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	USDA Forest Service
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	2/05
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	12 (rooftop)
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	5
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	25
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 8.3/24hr 28

Purpose: Leavenworth is a neighborhood scale site. Its primary purpose is for prescribed burning decision-making by USFS. This site is not suitable for comparison to the $PM_{2.5}$ NAAQS.

Twisp, Glover Street (USFS)

Site Name	Twisp, Glover Street
AQS ID	530470009
GPS coordinates	LAT/LONG: 48° 21' 51"/120 12' 40"
Location	In a building
Address	118 South Glover Street, Twisp
County	Okanogan
Distance to road from gaseous probe (meters)	2
Traffic count (AADT, year)	N/A
Groundcover	Concrete, asphalt
Statistical Area	MSA: Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	USDA Forest Service
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/03
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	25
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 9.4/24hr 25

Purpose: Twisp is a neighborhood scale site. Its primary purpose is for prescribed burning decision-making by USFS. This site is not suitable for comparison to the $PM_{2.5}$ NAAQS.

Winthrop, West Chewuch Road (USFS)

Site Name	Winthrop, West Chewuch Road
AQS ID	530470010
GPS coordinates	LAT/LONG: 048 28' 38"/120 11' 26"
Location	At the Methow Valley Ranger Station
Address	24 West Chewuch Road, Winthrop
County	Okanogan
Distance to road from gaseous probe (meters)	15
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	MSA: Not in an urban area
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	USDA Forest Service
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	11/03
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	5
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	1
Distance from trees (meters)	7
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual N/A/24hr N/A

Purpose: Winthrop is a neighborhood scale site. Its primary purpose is for prescribed burning decision-making by USFS. This site is not suitable for comparison to the $PM_{2.5}$ NAAQS.

Other – contracted sites Tribal/EPA

Table 13. Other - Contracted Sites Tribal/EPA						
AQS#	**Site Name (Tribe)**	**Est.**	**Type**	**Scale**	**Sampling Type**	**Action for 2016**
530090014	Neah Bay (Makah)	2/10	SLAMS	Neighborhood	Continuous	Continue
530470013	Omak (Colville)	10/10	SLAMS	Neighborhood	Continuous	Continue
530270011	Taholah (Quinault)	8/15	SLAMS	Neighborhood	Continuous	Continue
530770015	Toppenish (Yakama)	8/08	SLAMS	Neighborhood	Continuous	Continue
530650002	Wellpinit (Spokane)	10/08	SLAMS	Neighborhood	Continuous	Continue
530770016	White Swan (Yakama)	1/09	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors: None.

Recommendations/Modifications: None.

Comment: Nephelometers are not EPA equivalent method, nor compliance instruments, and design values are estimates.

Neah Bay (Makah Nation)

Site Name	Neah Bay, Makah Nation
AQS ID	530090014
GPS coordinates	LAT/LONG: 048 22' 19"/124 35' 43"
Location	In a building
Address	159 Waada View, Neah Bay
County	Clallam
Distance to road from gaseous probe (meters)	10
Traffic count (AADT, year)	N/A
Groundcover	Cement
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Makah Nation
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	2/10
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	9
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	270
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Neah Bay is a neighborhood scale site. It is used by the Makah Tribe for air quality information on the reservation. This information is also used by EPA Region 10 to determine burning curtailment calls in support of the Federal Rules for Reservations (FARR).

Omak (Colville Tribe)

Site Name	Omak, Colville Tribe
AQS ID	530470013
GPS coordinates	LAT/LONG: 048. 39' 99"/119 518' 96"
Location	A shelter
Address	8th Ave & Omak/Okanogan Rd
County	Okanogan
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Rock, dirt
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Colville Tribe
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/10
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	1
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	100
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	A Met One BAM 1020 FEM is planned for fall 2016
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A*

*Insufficient data.

Purpose: Omak is a neighborhood scale site. It is used by the Colville Tribe for air quality information on the reservation. This information is also used by EPA Region 10 to determine burning curtailment calls in support of the FARR.

Taholah, Chitwin Drive (Quinault Tribe)

Site Name	Taholah, Quinault Tribe
AQS ID	530270011
GPS coordinates	LAT/LONG: 047. 20’ 63”/124 172’ 22”
Location	On Quinault Tribal Property
Address	600 Chitwin Drive
County	Grays Harbor
Distance to road from gaseous probe (meters)	3
Traffic count (AADT, year)	N/A
Groundcover	
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Ecotech M90003/100G
Method code	812
FRM/FEM/ARM/other	Other
Collecting Agency	Quinault Tribe
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/2015
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	TBD
Distance from obstructions on roof (meters)	TBD
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	TBD
Distance to furnace or incinerator flue (meters)	TBD
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	TBD
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	N/A

*Insufficient data.

Purpose: Taholah is a neighborhood scale site. It is used by the Quinault Tribe for air quality information on the reservation. This information is also used by EPA Region 10 to determine burning curtailment calls in support of the FARR.

Toppenish, Ward Road (Yakama Nation)

Site Name	Toppenish, Ward Road
AQS ID	530770015
GPS coordinates	LAT/LONG: 046 23' 07"/120 18' 49"
Location	At Toppenish High School
Address	141 Ward Road, Toppenish
County	Yakima
Distance to road from gaseous probe (meters)	35
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903*
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Yakama Nation
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	8/08
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	A Met One BAM 1020 FEM is planned for fall 2016
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 10.7/24hr 41

*An FRM was sited at Toppenish on a 1/3 schedule during the heating season of 2015/2016 (11/05/2015 – 6/30/2016) to establish a correlation for the nephelometer.

Purpose: Toppenish is a neighborhood scale site. It is used by the Yakama Tribe for air quality information on the reservation. This information is also used by EPA Region 10 to determine burning curtailment calls in support of the FARR.

Wellpinit, Ford-Wellpinit Road (Spokane Tribe)

Site Name	Wellpinit, Ford-Wellpinit Road
AQS ID	530650002
GPS coordinates	LAT/LONG: 047 53' 19"/117 59' 19"
Location	Rooftop of Spokane Tribal Property
Address	5298 Ford-Wellpinit Road, Wellpinit
County	Stevens
Distance to road from gaseous probe (meters)	150
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	10/08
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 5.98/24hr 15

Purpose: Wellpinit is a neighborhood scale site. It is used by the Spokane Tribe for air quality information on the reservation. This information is also used by EPA Region 10 to determine burning curtailment calls in support of the FARR.

White Swan (Yakama Nation)

Site Name	White Swan-Yakama
AQS ID	530770016
GPS coordinates	LAT/LONG: 046.37' 54"/120 72' 93"
Location	At Mt. Adams School
Address	621 Signal Peak Rd, White Swan
County	Yakima
Distance to road from gaseous probe (meters)	3
Traffic count (AADT, year)	N/A
Groundcover	Grass
Statistical Area	MSA: Not in an MSA
Monitor Information Pollutant, POC	
Parameter code	88502 (POC 3)
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	Radiance Research M903
Method code	771
FRM/FEM/ARM/other	Other
Collecting Agency	Yakama Tribe
Analytical Lab	N/A
Reporting Agency	Ecology
Spatial scale	Neighborhood
Monitoring start date	1/09
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	2
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the $PM_{2.5}$ NAAQS?	No
Design value	Annual 6.87/24hr N/A*

*Insufficient data.

Purpose: White Swan is a neighborhood scale site. It is used by the Yakama Tribe for air quality information on the Yakama Reservation. This information is also used by EPA Region 10 to determine burning curtailment calls in support of the FARR.

Lead (Pb 14129)

Table 14. Pb, Parameter Code 85129						
AQS#	**Site Name**	**Est.**	**Type**	**Scale**	**Sampling Type**	**Action for 2016**
530330080	Seattle, Beacon Hill	1/13	NCore	Urban	1/6	Continue

Additional Monitors: None.

Recommendations/Modifications: None. EPA changed the monitoring rule in 2016 and is no longer requiring Pb monitoring at NCore sites. Currently there is no extra cost to Ecology to sample for Pb and we will continue to do so until further notice.

Note: Ecology has EPA Region 10 approval to use the PM_{10} sampler, which is part of the PM Course sampling for lead monitoring. Eastern Research Group (ERG), an EPA contractor, performs the analysis and submits the data to the Air Quality System (AQS). There is an SOP in Ecology's Quality Assurance Plan for this instrument. This monitor fulfills the requirement to demonstrate compliance with the 2008 lead NAAQS.

Seattle, Beacon Hill

Site Name	Seattle Beacon Hill
AQS ID	530330080
GPS coordinates	LAT/LONG: 047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue S., Seattle
County	King
Distance to road from gaseous probe (meters)	N/A
Traffic count (AADT, year)	N/A
Groundcover	Gravel, grass
Statistical Area	MSA: Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	85129
Basic monitoring objectives(s)	NAQQS Compliance
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	NCore
Method code	907
FRM/FEM/ARM/other	Thermo 2025 FRM
Collecting Agency	Ecology
Analytical Lab	ERG
Reporting Agency	ERG
Spatial scale	Urban
Monitoring start date	1/13
Current sampling frequency	1/6
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the Pb NAAQS?	Yes

Purpose: The purpose of sampling at Seattle Beacon Hill is to meet EPA NAAQS minimum Pb requirements.

Trace gas monitoring

NCore – Precursor Gas & Multi-Pollutant Monitoring – From an emission source perspective, multiple pollutants and their precursors are released simultaneously (e.g., a combustion plume with nitrogen, carbon, hydrocarbon, mercury, sulfur gases, and particulate matter). Meteorological processes that shape pollutant movement, atmospheric transformations, and removal act on all pollutants. Numerous chemical and physical interactions underlie the dynamics of particle and ozone formation and the adherence of air toxics on surfaces of particles.

Overwhelming programmatic and scientific interactions across pollutants have demanded a movement toward integrated air quality management. Multi-pollutant air monitoring benefits health assessments and emissions strategy development. Health studies with access to multi-pollutant data will be better positioned to identify effects of different pollutants, particularly when concentration, composition, and population types are included. Air quality models and source attribution methods used for strategy development also benefit from the multi-pollutant approach. Modelers will be able to perform more robust evaluations by checking performance on several variables to ensure the model produces results for correct reasons and not through compensating errors. As emission sources are characterized by a multiplicity of pollutant releases, related source apportionment models yield more conclusive results from use of multi-pollutant measurements. Multi-pollutant measurements also streamline monitoring operations and offer increased diagnostic capabilities to improve instrument performance.

The multi-pollutant monitoring provided for these needs by starting to fill the measurement gaps that have accumulated over the years. The objective of this strategy is to provide for the following important needs:

- Improved data flow and timely reporting to the public.
- Future NAAQS compliance determinations and revisions.
- Support for development of emissions strategies.
- Assess effectiveness of air pollution control programs.
- Data for scientific and health-based studies.

Table 15. Trace Gas Monitoring CO, SO_2, NO_y

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2016
530330080	Seattle Beacon Hill	3/07	NCore	Urban	Continuous	Continue
530090013	Cheeka Peak	5/06	Rural NCore	Regional	Continuous	Continue

Additional Monitors: None.

Recommendations/Modifications: None.

Note: Details of trace gas monitoring are found in CO, NO, SO_2 sections.

Table 16. NCore Parameters Seattle Beacon Hill						
Parameter	**Parameter Code**	**Sampling/ Analysis Method**	**Sampling Schedule**	**Spatial Scale**	**Instrument Type**	**Action for 2016**
Ozone	44201	Continuous		Urban	API 400 E	Continue
SO_2 trace	42401	Continuous		Urban	APIT100U	Continue
CO trace	42101	Continuous		Urban	API 300EU	Continue
NOy trace	42600	Continuous		Urban	API200EU	Continue
$PM_{2.5}$ mass	88101	Manual	1/3	Urban	Thermo 2025	Continue
$PM_{2.5}$ continuous	88502	Continuous		Urban	Thermo FDMS TEOM 1400a + 8500	Continue
$PM_{2.5}$ speciation	88502	Continuous & Manual	1/3	Urban	Met One SSAS & URG 3000N Carbon	Continue
$PM_{2.5}$ speciation	88502	Manual	IMPROVE	Urban	IMPROVE	Continue
$PM_{10\text{-}2.5}$	86101	Manual	1/3	Urban	Thermo 2025	Continue
$PM_{10\text{-}2.5}$ speciation	**Not sampling**	**Not sampling**	**Not sampling**	Urban	None	TBD
Pb		Manual		Urban	Thermo 2025	Continue
WS & WD	61101/61102	Continuous		Urban	RM Young 85004	Continue
Ambient temperature	62101	Continuous		Urban	RM Young Platinum probe	Continue
Ambient pressure	64101	Continuous		Urban	RM Young	Continue
Relative humidity	62201	Continuous		Urban	Rotronics	Continue
Precipitation		Continuous		Urban	RM Young 52202	Continue

Purpose: Seattle Beacon Hill is an urban scale site. It monitors for trace level CO, SO_2, NO_2, $PM_{2.5}$, air toxics, speciation, IMPROVE and other studies. Also measured at Seattle Beacon Hill: $PM_{2.5}$ chemical speciated particulate matter, volatile organic compounds, metals, carbonyls and semi-volatile (PAH). Operation of all parameters including IMPROVE are projected to continue until further notice.

Table 17. NCore Parameters Cheeka Peak						
Parameter	**Parameter Code**	**Sampling/ Analysis Method**	**Sampling schedule**	**Spatial Scale**	**Instrument Type**	**Action for 2016**
Ozone	44201	Continuous	Continuous	Rural	API T400	Continue
SO_2 trace	42401	Continuous	Continuous	Rural	API T100U	Continue
CO trace	42101	Continuous	Continuous	Rural	API T300U	Continue
NOy trace	42600	Continuous	Continuous	Rural	API T200U	Continue
$PM_{2.5}$ mass	88101	Manual	IMPROVE	Rural	IMPROVE	Continue
$PM_{2.5}$ continuous	88502	Continuous	Continuous	Rural	Radiance Research M903 Nephelometer Correlated	Continue
Light scatter	11203	Continuous	Continuous	Rural	" "	Continue
Visibility	63101	Continuous	Continuous	Rural	" "	Continue
$PM_{2.5}$ speciation	88502	Manual	IMPROVE	Rural	IMPROVE	Continue
$PM_{10\text{-}2.5}$	**Not sampling**	**Not sampling**	**Not sampling**	Rural	None	TBD
$PM_{10\text{-}2.5}$ speciation	**Not sampling**	**Not sampling**	**Not sampling**	Rural	None	TBD
WS, WD & sigma	61101/61102/ 61106	Continuous	Continuous	Rural	RM Young 86004	Continue
Ambient temperature	62101	Continuous	Continuous	Rural	RM Young Platinum probe	Continue
Ambient pressure	64101	Continuous	Continuous	Rural	RM Young	Continue
Relative humidity	62201	Continuous	Continuous	Rural	Rotronics	Continue

Purpose: Cheeka Peak is a regional scale site. Parameters measured at Cheeka Peak are: $PM_{2.5}$, ozone, trace-level CO, SO_2, NO_y, $PM_{2.5}$, and meteorology.

Toxics

Collocated National Air Toxics Trend Site (NATTS) - In addition to the STN and NCore Precursor Gas Monitoring Programs, Beacon Hill is also a designated National Air Toxics Trend Site (NATTS). The primary objectives of Washington's NATTS Monitoring Program include but are not limited to:

- Provide long-term air toxic monitoring data in order to establish and track trends.
- Evaluate the air toxic program's progress by characterizing air toxics concentrations, and determining their spatial and temporal differences between cities and regions over time.
- Provide representative air toxic data to support exposure assessments (i.e., determine health risks).
- Determine where air toxics emissions come from (source apportionment).
- Provide air toxic data for evaluating modeling results that are used for exposure assessments.
- Assess the effectiveness of the air toxic program's emission reduction and control strategies.

Table 18. Toxics

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2016
530330080	Seattle Beacon Hill	4/97	NCore	Urban	Manual	Continue

Additional Monitors: None.

Recommendations/Modifications: Continue listed site as described.

Seattle, Beacon Hill NCore

Site Name	Seattle, Beacon Hill
AQS ID	530330080
GPS coordinates	047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue S., Seattle
County	King
Distance to road from gaseous probe (meters)	
Traffic count (AADT, year)	
Groundcover	Grass, gravel
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	Unknown
Basic monitoring objectives(s)	Special Studies
Site type(s)	
Monitor type(s)	SPMS
Instrument manufacturer and model	Zontech (Zonteck) 910PC VOCs (cans), 925 Carbonyls (tubes)
Method code	Unknown
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	ERG
Reporting Agency	ERG
Spatial scale	Urban
Monitoring start date	4/97
Current sampling frequency	1/3
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	4.65
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	20
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Seattle Beacon Hill is a designated NATTS. Seattle Beacon Hill monitoring station was nominated by the National Air Toxics Committee and chosen by EPA headquarters to represent urban scale air toxics in the Pacific Northwest. It is currently the only designated urban scale NATTS located in the Pacific Northwest.

Speciation

Chemical Speciation Trends Network (CSN) - The $PM_{2.5}$ Chemical Speciation Program continues to have a significant role in the new Monitoring Strategy. Washington's Speciation Trends Network (STN) site is located at Jefferson Park on Beacon Hill in Seattle. The primary goal of the $PM_{2.5}$ speciation monitoring is to:

- Provide long-term data in order to establish and track trends.
- Determine the spatial and temporal differences of $PM_{2.5}$ composition between cities and regions over time.
- Provide representative $PM_{2.5}$ speciation data to support exposure assessments (i.e., determine health risks).
- Determine where $PM_{2.5}$ emissions come from (source apportionment).
- Evaluate modeling results that are used for exposure assessments.
- Assess the effectiveness of the program's emission reduction and control strategies.

Table 19. Speciation

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2016
530330080	Seattle Beacon Hill	4/97	NCore	Urban	1/3	Continue
530330030	Seattle 10th & Weller	2015	SPMS	Neighborhood	1/6	Continue
530530029	Tacoma L St	2008	SPMS	Neighborhood	1/6	Continue
530770009	Yakima	2002	SPMS	Neighborhood	1/6	Continue

Additional Monitors: None.

Recommendations/Modifications: None.

Speciation Parameter codes:

88102	Antimony	88126	Iron	88167	Zinc	88370	OC CSN Rev Unadjusted
88103	Arsenic	88128	Lead	88168	Strontium	88374	OC1 CSN Rev Unadjusted
88104	Aluminum	88131	Indium	88169	Sulfur	88375	OC2 CSN Rev Unadjusted
88107	Barium	88132	Manganese	88176	Rubidium	88376	OC3 CSN Rev Unadjusted
88109	Bromine	88136	Nickel	88180	Potassium	88377	OC4 CSN Rev Unadjusted
88110	Cadmium	88140	Magnesium	88184	Sodium	88378	OP CSN Rev Unadjusted
88111	Calcium	88152	Phosphorus	88185	Zirconium	88380	EC CSN Rev Unadjusted
88112	Chromium	88154	Selenium	88301	Ammonium Ion	88383	EC1 CSN Rev Unadjusted
88113	Cobalt	88160	Tin	88302	Sodium Ion	88384	EC2 CSN Rev Unadjusted
88114	Copper	88161	Titanium	88303	Potassium Ion	88385	EC3 CSN Rev Unadjusted
88115	Chlorine	88164	Vanadium	88306	Total Nitrate	88388	OP CSN Rev Unadjusted
88117	Cerium	88165	Silicon	88355	OC CSN Rev Unadj	88403	Sulfate
88118	Cesium	88166	Silver	88357	EC CSN Rev Unadj	88502	PM2.5 Speciation Mass

Seattle, Beacon Hill NCore

Site Name	Seattle, Beacon Hill
AQS ID	530330080
GPS coordinates	047 34' 58"/122 18' 30"
Location	At Jefferson Park/reservoir
Address	4103 Beacon Avenue S., Seattle
County	King
Distance to road from gaseous probe (meters)	10
Traffic count (AADT, year)	12,700 (2012 WSDOT
Groundcover	Gravel, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	See list above
Basic monitoring objectives(s)	Special Studies
Site type(s)	Population Exposure
Monitor type(s)	NCore
Instrument manufacturer and model	URG 3000N, Met One SASS (Super SASS)
Method code	
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	RTI
Reporting Agency	Ecology
Spatial scale	Urban
Monitoring start date	3/07
Current sampling frequency	1/3
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	20
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Provide long-term data to establish and track trends, determine spatial and temporal differences of $PM_{2.5}$ composition between cities and regions over time, provide representative $PM_{2.5}$ speciation data to support exposure assessments, and determine where $PM_{2.5}$ emissions come from.

Supplemental Speciation Sites: In addition to the Seattle Beacon Hill speciation trends network site, Washington operates three supplemental speciation sites. Supplemental sites are located at Seattle, 10th and Weller; Tacoma, South L Street; and Yakima, S. 4th Avenue.

Seattle, 10th & Weller

Site Name	Seattle, 10th & Weller
AQS ID	530330030
GPS coordinates	LAT/LONG: 047 59' 72"/122 31' 97"
Location	Adjacent to Interstate 5 in Downtown Seattle
Address	10th & Weller
County	King
Distance to road from gaseous probe (meters)	6
Traffic count (AADT, year)	146,000 I-5 (2012 WSDOT)
Groundcover	Concrete, Grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	See list above
Basic monitoring objectives(s)	Special Studies
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	URG 3000N, Met One SASS
Method code	
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	RTI
Reporting Agency	RTI
Spatial scale	Neighborhood
Monitoring start date	3/15
Current sampling frequency	1/6
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	3
Distance from supporting structure (meters)	3
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Seattle 10th & Weller is Washington's primary near-road monitoring site. Provide long-term data to establish and track trends, determine spatial and temporal differences of $PM_{2.5}$ composition between cities and regions over time, provide representative $PM_{2.5}$ speciation data to support exposure assessments, and determine where $PM_{2.5}$ emissions come from.

Tacoma, South L Street (PSCAA)

Site Name	Tacoma L Street
AQS ID	530530029
GPS coordinates	047 11' 11"/122 27' 06"
Location	A shelter
Address	7802 South L Street, Tacoma
County	Pierce
Distance to road from gaseous probe (meters)	100
Traffic count (AADT, year)	N/A
Groundcover	Asphalt, grass
Statistical Area	Seattle-Bellevue-Everett, WA
Monitor Information Pollutant, POC	
Parameter code	See list above
Basic monitoring objectives(s)	Special Studies
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	URG 3000N, Met One SASS
Method code	
FRM/FEM/ARM/other	Other
Collecting Agency	Ecology
Analytical Lab	RTI
Reporting Agency	RTI
Spatial scale	Neighborhood
Monitoring start date	11/06
Current sampling frequency	1/6
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Provide long-term data to establish and track trends, determine spatial and temporal differences of $PM_{2.5}$ composition between cities and regions over time, provide representative $PM_{2.5}$ speciation data to support exposure assessments, and determine where $PM_{2.5}$ emissions come from.

Yakima, S. 4th (YRCAA)

Site Name	Yakima S. 4th (YRCAA)
AQS ID	530770009
GPS coordinates	046 35' 42"/120 30' 44"
Location	At Yakima Comprehensive M H
Address	402 South 4th Avenue, Yakima
County	Yakima
Distance to road from gaseous probe (meters)	14
Traffic count (AADT, year)	N/A
Groundcover	Asphalt roof, grass & cement on the ground
Statistical Area	Yakima, WA
Monitor Information Pollutant, POC	
Parameter code	See list above
Basic monitoring objectives(s)	Special Studies
Site type(s)	Population Exposure
Monitor type(s)	SPMS
Instrument manufacturer and model	URG 3000N, Met One SASS
Method code	
FRM/FEM/ARM/other	Other
Collecting Agency	Yakima Region Clean Air Agency
Analytical Lab	RTI
Reporting Agency	RTI
Spatial scale	Neighborhood
Monitoring start date	11/07
Current sampling frequency	1/6
Calculated sampling frequency	N/A
Sampling season	Year-round
Probe height (meters)	2
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	N/A
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Spacing from minor sources	No minor sources
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Changes within the next 18 months?	None anticipated
Is it suitable for comparison against the NAAQS?	No

Purpose: Provide long-term data to establish and track trends, determine spatial and temporal differences of $PM_{2.5}$ composition between cities and regions over time, provide representative $PM_{2.5}$ speciation data to support exposure assessments, and determine where $PM_{2.5}$ emissions come from.

Appendix A. EPA Appendix D Forms

PART 58 APPENDIX D SITE EVALUATION FORM FOR CARBON MONOXIDE (CO)					
SITE NAME_____All_____SITE ADDRESS_____ AQS ID_____ EVALUATION DATE_____EVALUATOR_____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
4.2.1(a)	One CO monitor is required to operate collocated with one required near-road NO_2 monitor 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.		Y		
4.2.2(a)	Has the EPA Regional Administrator required additional CO monitoring stations above the minimum number of monitors required in 4.2.1? If so, note location in comment field.		N		
Comments:					

MSA Description[1]	CBSA population[2, 3]	Minimum required number of SLAMS CO sites	Present number of SLAMS CO sites in MSA
Seattle-Tacoma-Bellevue, WA NCore & Near Road	3,733,580	1	2
Spokane, WA	547,824	1	1
Cheeka Peak (not in an MSA) NCore		1	1

[1]see http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[2]Minimum monitoring requirements apply to the Core Based statistical area (CBSA). CBSA includes both metropolitan and micropolitan statistical areas.

[3]Population based on latest available census figures.

PART 58 APPENDIX D SITE EVALUATION FORM FOR PM_{10}				
SITE NAME_____All_____ SITE ADDRESS_____ AQS ID_____ EVALUATION DATE_____ EVALUATOR_____				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.6(a)	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. Use the form below and Table D-4 to verify if your PM_{10} network has to appropriate number of samplers.	Y	*	
Comments: * Seattle-Tacoma-Bellevue, WA has fewer PM_{10} monitors than required by CFR. The total numbers of PM_{10} analyzers/samplers in this area was reduced through previous Annual Network Plans and approved by EPA.				

MSA Description[1]	MSA population [1] (2015)	Minimum required number of PM_{10} stations (from Table D-4)	Present number of PM10 stations in MSA
Seattle-Tacoma-Bellevue, WA	3,733,580	2-4	1
Spokane, WA	547,824	1-2	1
Kennewick, WA	279,116	1-2	1
Yakima, WA	248,830	1-2	1

[1]see http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[2]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA). CBSA includes both MSAs and micropolitan statistical areas.

[3]Population based on latest available census figures.

Table D-4 of Appendix D to Part 58 – PM_{10} Minimum Monitoring Requirements			
MSA population[1, 2]	High concentration2	Medium concentration3	Low concentration4 5
>1 million	6-10	4-8	2-4
500K to 1 million	4-8	2-4	1-2
250K to 500K	3-4	1-2	0-1
100K to 250K	1-2	0-1	0

PART 58 APPENDIX D SITE EVALUATION FORM FOR NITROGEN DIOXIDE (NO_2)				
SITE NAME_____All_____ SITE ADDRESS_____				
AQS ID_____ EVALUATION DATE_____ EVALUATOR_____				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.3.2(a)	Near-road NO_2 Monitors: One microscale near-road NO_2 monitoring station in each CBSA with a population of 500,000 or more persons.	Y		
4.3.2(a)	Near-road NO_2 Monitors: An additional near-road NO_2monitoring station is required for any CBSA with a population of 2,500,000 persons, or in any CBSA with a population of 500,000 or more persons that has one or more roadway segments with 250,000 or greater AADT count.	Y		
4.3.2(b)	Near-road NO_2 Monitors: Measurements at required near-road NO_2 monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO_2, and NO_X	Y		
4.3.3(a)	Area-wide NO_2 Monitoring: 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.	Y		

Table 1

CBSA Description[1]	CBSA population[2, 3]	Required number of Near-road NO_2 sites	Present number of Near-road NO_2 sites	Required number of Area-wide NO_2 sites	Present number of Area-wide NO_2 sites
Seattle-Tacoma-Bellevue, WA (see comments)	3,733,580	2	2	1	1
Cheeka Peak (not in an MSA) NCore					

[1]see http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[2]Minimum monitoring requirements apply to the Core Based statistical area (CBSA). CBSA includes both metropolitan and micropolitan statistical areas.

[3]Population based on latest available census figures.

PART 58 APPENDIX D SITE EVALUATION FORM FOR $PM_{2.5}$

STATE___WA_____ AGENCY___ECOLOGY_____AQS AGENCY CODE_____ECOLOGY_____

EVALUATION DATE_____ EVALUATOR_____

APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.7.1(a)	States, and where applicable local agencies must operate the minimum number of required $PM_{2.5}$ SLAMS sites listed in Table D-5 of this appendix. Use the form below and Table D-5 to verify if each of your MSAs has the appropriate number of SLAMS FRM/FEM/ARM samplers.	Y		
4.7.1(b)	Each required SLAMS FRM/FEM/ARM monitoring stations or sites must be sited to represent area-wide air quality in the given MSA (typically neighborhood or urban spatial scale, though micro-or middle-scale okay if it represent many such locations throughout the MSA).	Y		
4.7.1(b)(1)	At least one SLAMS FRM/FEM/ARM monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration for each MSA where monitoring is required by 4.7.1(a).	Y		
4.7.1(b)(2)	For CBSAs with a population of 1,000,000 or more persons, at least one FRM/FEM/ARM $PM_{2.5}$ monitor is to be collocated at a near-road NO_2 station.	Y*		
4.7.1(b)(3)	For MSAs with additional required SLAMS sites, a FRM/FEM/ARM monitoring station is to be sited in an area of poor air quality.	Y		
4.7.2	Each State 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. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor, in which case no collocation requirement applies.	Y		
4.7.3	Each State shall install and operate at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor regional transport (note locations in comment field). Non-reference $PM_{2.5}$ monitors such as IMPROVE can be used to meet this requirement.	Y**		
4.7.4	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 (STN).	Y***		

Comments:

*A $PM_{2.5}$ FEM is located at the Seattle 10th & Weller near-road site.

** Regional background site: Seattle Beacon Hill. Regional Transport site: North Bend.

***STN site: Seattle Beacon Hill

MSA Description[1]	MSA population[2,3]	Design Value for years 2012-2014	Minimum required number of $PM_{2.5}$ SLAMS FRM/FEM/ARM sites (from Table D-5)	Present number of $PM_{2.5}$ SLAMS FRM/FEM/ARM sites in MSA	Present number of continuous $PM_{2.5}$ FEM/ARM analyzers in MSA	Present number of continuous $PM_{2.5}$ STN analyzers in MSA
Seattle-Tacoma-Bellevue, WA	3,733,580	32.0 FEM	3	5	5	1
Spokane, WA	547,824	Insufficient data	1	1	1	0
Kennewick, WA	279,116	Insufficient data	0	0	0	0
Olympia-Tumwater, WA	269,536	25.0 Neph	0	0	0	0
Bremerton-Silverdale, WA	260,131	13	0	0	1	0
Yakima, WA	248,830	34.0 FEM	0	1		0
Mt. Vernon-Anacortes WA	121,846	12.0 Neph	0	0	0	0

[1]see http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[2]Minimum monitoring requirements apply to the metropolitan statistical area (MSA). CBSA includes both MSAs and micropolitan statistical areas.

[3]Population based on latest available census figures.

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

MSA population[1, 2]	Most recent 3-year design value ≥85% of any $PM_{2.5}$ NAAQS[3]	Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS[3, 4]
>1 million	3	2
500K to 1 million	2	1
50K to <500K[5]	1	0

[1]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
[2]Population based on latest available census figures. https://www.census.gov/
[3]The $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
[4]These minimum monitoring requirements apply in the absence of a design value.
[5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

PART 58 APPENDIX D SITE EVALUATION FORM FOR OZONE				
STATE___WA_____ AGENCY_____ECOLOGY_____AQS AGENCY CODE_____ EVALUATION DATE_____ EVALUATOR_____				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.1(b)	At least one O_3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration (note location in comment field).	Y		
4.1(c)	The appropriate spatial scales for O_3 sites are neighborhood, urban, and regional (note deviations in comment field).	Y		
4.1(f)	Confirm that the monitoring agency consulted with EPA R10 when siting the maximum O_3 concentration site.		N	
4.1(i)	O_3 is being monitored at SLAMS monitoring sites during the "ozone season" as specified in Table D-3 of Appendix D to Part 58.	Y		
Comments:				

MSA population[1, 2]	Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS[3]	Most recent 3-year design value concentrations <85% of any O_3 NAAQS[3, 4]
>10 million	4	2
4-10 million	3	1
350,000-<4 million	2	1
50,000-<350,000[5]	1	0

[1]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA). CBSA includes both MSAs and micropolitan statistical areas.
[2]Population based on latest available census figures.
[3]The ozone (O_3) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
[4]These minimum monitoring requirements apply in the absence of a design value.
[5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table D-2 of Appendix D to Part 58 - SLAMS O3 Monitoring Minimum Requirements			
MSA Description[a]	MSA population[1, 2]	Minimum required number of SLAMS O_3 sites (from Table D-2)	Present number of SLAMS O_3 sites in CBSA
Seattle-Tacoma Bellevue, WA	3,733,580	3	6
Spokane, WA	547,824	2	2
[a]see http://www2.census.gov/econ/susb/data/msa_codes_2007_to_2011.txt			

Table D-3 of Appendix D to Part 58— Ozone Monitoring Season by State		
State	Begin month	End Month
Alaska	April	October
Idaho	May	September
Oregon	May	September
Washington	May	September

PART 58 APPENDIX D SITE EVALUATION FORM FOR SO_2				
STATE___WA_____ AGENCY_____ECOLOGY_____AQS AGENCY CODE_____ EVALUATION DATE_____ EVALUATOR_____				
APPLICABLE SECTION	REQUIREMENT	CRITERIA MET?		
		YES	NO	N/A
4.4.1	State and, where appropriate, local agencies must operate a minimum number of required SO_2 monitoring sites (based on PWEI calculation specified in 4.4.2 – use Table 1 and 2 below to determine minimum requirement for each CBSA)	Y		
4.4.2(a)(1)	Is the monitor sited within the boundaries of the parent CBSA and is it one of the following site types: population exposure, highest concentration, source impacts, general background, or regional transport?	Y		
4.4.3(a)	Has the EPA Regional Administrator required additional SO_2 monitoring stations above the minimum number of monitors required in 4.4.2? If so, note location in comment field.		N	
4.4.5(a)	Is your agency counting an existing SO_2 monitor at an NCore site in a CBSA with a minimum monitoring requirement?	Y		
Comments:				

Table 1.

CBSA Description[1]	CBSA population[1, 2]	total amount of SO_2 in tons per year emitted within the CBSA (use 2008 NEI[4])	PWEI (population x total emissions ÷ 1,000,000)	Minimum required number of SO_2 monitors in CBSA (see Table 2 below)	Present number of SO_2 monitors in CBSA
Seattle-Tacoma-Bellevue, WA NCore	3,733,580	4,384	16,368	1	1
Cheeka Peak (not in an MSA) NCore				1	1

[1]see http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[2]Minimum monitoring requirements apply to the Core Based statistical area (CBSA). CBSA includes both metropolitan and micropolitan statistical areas.

[3]Population based on latest available census figures.

[4]see http://www.epa.gov/ttn/chief/eiinformation.html

Table 2. Minimum SO_2 Monitoring Requirements (Section 4.4.2 of App D to Part 58)

PWEI (Population weighted Emission Index) Value	Require number of SO_2 monitors
>= 1,000,000	3
>= 100,000 but < 1,000,000	2
>= 5,000 but < 100,000	1

Appendix B. EPA Appendix E Forms

PART 58 APPENDIX E SITE EVALUATION FORM FOR CO					
SITE NAME_____All_____ SITE ADDRESS_____ AQS ID_____ EVALUATION DATE_____ EVALUATOR_____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICLE PLACEMENT	For neighborhood or larger spatial scale sites the probe must be located 2-15 meters above ground level and must be at least 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.		Y		
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.		Y		
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet (exception is street canyon or source-oriented sites where buildings and other structures are unavoidable).		Y		
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.		Y		
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.		Y		
	(c) No trees should be between source and probe inlet for microscale sites.		Y		
6. SPACING FROM ROADWAYS	2. (b) Microscale CO monitor probes in downtown areas or urban street canyon locations shall be located a minimum distance of 2 meters and a maximum distance of 10 meters from the edge of the nearest traffic lane.		Y		
	2. (c) Microscale CO monitor inlet probes in downtown areas or urban street canyon locations shall be located at least 10 meters from an intersection and preferably at a midblock location.				N/A
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex) for reactive gases.		Y		
	(c) Sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.		Y		
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.				N	
Other Comments: Please see Carbon Monoxide section for detail on individual sites.					

Roadway average daily traffic, vehicles per day	Minimum distance[1] (meters)
≤10,000	10
15,000	25
20,000	45
30,000	80
40,000	115
50,000	135
≥60,000	150

1. Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

PART 58 APPENDIX E SITE EVALUATION FORM FOR $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$,and Pb					
SITE NAME_____All_____ SITE ADDRESS_____ AQS ID_____ EVALUATION DATE_____ EVALUATOR_____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICLE PLACEMENT	2-15 meters above ground level for neighborhood or larger spatial scale, 2-7 meters for microscale spatial scale sites and middle spatial scale $PM_{10-2.5}$ sties. 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.		Y		
3. SPACING FROM MINOR SOURCES	(a) For neighborhood or larger spatial scales avoid placing the monitor near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site. Particulate matter sites should not be located in an unpaved area unless there is vegetative ground cover year round.		Y		
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.		Y		
	(b) The inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential. For particle sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.		Y		
5. SPACING FROM TREES	(a) To reduce possible interference the inlet must be at least 10 meters or further from the drip line of trees.		Y		
	(c) No trees should be between source and probe inlet for microscale sites.		Y		
6. SPACING FROM ROADWAYS	Spacing from roadways is dependent on the spatial scale and ADT count. See section 6.3(b) and figure E-1 for specific requirements.		Y		
Are there any changes that might compromise original siting criteria?				N	
Other Comments: Please see the $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$ and Pb sections for individual detail.					

PART 58 APPENDIX E SITE EVALUATION FORM FOR NO, NOx, NO_2, and NOy					
SITE NAME_____All_____ SITE ADDRESS_____ AQS ID_____ EVALUATION DATE_____ EVALUATOR_____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICLE PLACEMENT	For neighborhood or larger spatial scale sites the probe must be located 2-15 meters above ground level and must be at least 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. Microscale near-road NO_2 monitoring sites are required to have sampler inlets between 2 and 7 meters above ground level. If located near the side of a building or wall, then locate the sampler probe on the windward side relative to the prevailing wind direction during the season of highest concentration potential.		Y		
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale and larger avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.		Y		
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.		Y		
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.		Y		
	(d) For near-road NO_2 monitoring stations, the monitor probe shall have an unobstructed air flow, where no obstacles exist at or above the height of the monitor probe, between the monitor probe and the outside nearest edge of the traffic lanes of the target road segment.		Y		
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.		Y		
	(c) No trees should be between source and probe inlet for microscale sites.		Y		
6. SPACING FROM ROADWAYS	See spacing requirements table below		Y		
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex).		Y		
	(c) Sampling probes for reactive gas monitors at NCore and at NO_2 sites must have a sample residence time less than 20 seconds.		Y		
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.				N	
Other Comments: Please see the NO, NO_X, NO_2 and NO_y section for detail on individual sites.					

Roadway average daily traffic, vehicles per day	Minimum distance[1] (meters)	Minimum distance[1, 2] (meters)
≤1,000	10	10
10,000	10	20
15,000	20	30
20,000	30	40
40,000	50	60
70,000	100	100
≥110,000	250	250

[1]Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

[2]Applicable for ozone monitors whose placement has not already been approved as of December 18, 2006.

PART 58 APPENDIX E SITE EVALUATION FORM FOR SO_2					
SITE NAME_____All_____ SITE ADDRESS_____ AQS ID_____ EVALUATION DATE_____EVALUATOR_____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICLE PLACEMENT	2-15 meters above ground level. 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.		Y		
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.		Y		
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.		Y		
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.		Y		
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.		Y		
	(c) No trees should be between source and probe inlet for microscale sites.		Y		
6. SPACING FROM ROADWAYS	There are no roadway spacing requirements for SO_2.				✓
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex).		Y		
	(c) Sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.		Y		
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.				N	
Other Comments: Please see the SO_2 section for detail on individual sites.					

PART 58 APPENDIX E SITE EVALUATION FORM FOR O_3					
SITE NAME____All_____ SITE ADDRESS_____					
AQS ID_____ EVALUATION DATE_____EVALUATOR_____					
APPLICABLE SECTION	REQUIREMENT	OBSERVED	CRITERIA MET?		
			YES	NO	N/A
2. HORIZONTAL AND VERTICLE PLACEMENT	2-15 meters above ground level. 1 meter vertically or horizontally away from any supporting structure, walls, *etc.*, and away from dusty or dirty areas. If located near the side of a building or wall, then locate on the windward side relative to the prevailing wind direction during the season of highest concentration potential.		Y		
3. SPACING FROM MINOR SOURCES	(a) For neighborhood scale avoid placing the monitor probe inlet near local, minor sources. The source plume should not be allowed to inappropriately impact the air quality data collected at a site.		Y		
	(b) To minimize scavenging effects, the probe inlet must be away from furnace or incineration flues or other minor sources of SO_2 or NO.		Y		
4. SPACING FROM OBSTRUCTIONS	(a) To avoid scavenging, the probe inlet must have unrestricted airflow and be located away from obstacles. The separation distance must be at least twice the height that the obstacle protrudes above the probe inlet.		Y		
	(b) The probe inlet must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.		Y		
5. SPACING FROM TREES	(a) To reduce possible interference the probe inlet must be at least 10 meters or further from the drip line of trees.		Y		
	(c) No trees should be between source and probe inlet for microscale sites.		Y		
6. SPACING FROM ROADWAYS	See spacing requirements table below		Y		
9. PROBE MATERIAL & RESIDENCE TIME	(a) Sampling train material must be FEP Teflon or borosilicate glass (e.g., Pyrex).		Y		
	(c) Sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.		Y		
Are there any changes that might compromise original siting criteria? If so, provide detail in comment section.				N	
Other Comments: Please see the Ozone section for detail on individual sites.					

Roadway average daily traffic, vehicles per day	Minimum distance[1] (meters)	Minimum distance[1, 2] (meters)
≤1,000	10	10
10,000	10	20
15,000	20	30
20,000	30	40
40,000	50	60
70,000	100	100
≥110,000	250	250

[1]Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

[2]Applicable for ozone monitors whose placement has not already been approved as of December 18, 2006.

Appendix C. Public Comment and Response to Comment

During the comment period, Washington State Department of Ecology (Ecology) received the following comment about the Alcoa Intalco smelter' plume. The commenter, Mr. Larry McCarter provided 10 pictures taken at various times and one video. (The video was submitted separately from Ecology to EPA by e-mail.) Mr. McCarter wrote:

> "I wish to comment that the Alcoa smelter emits a light white smoke that can be seen every day the wind is somewhat calm and the evening sun is out. What is in this smoke? I also see dust from the Ships as they unload product for the smelter and a photo of that is attached as well. These events happen all the time.
>
> I wish to comment by submitting these photos that represent what I see every time I fly in calm, sunny, evening conditions over the smelter. I have never known what I am looking at and I think we should all know what we are breathing, apparently every day.
>
> Additionally, there are photos of the dust created when they offload the ships. I am told the ocean bottom surrounding the dock is at least one foot thick of this bauxite dust. IS this possible?
>
> What is the white dust on the buildings that is around each of the air vents? I have a mini video I took of the smoke and will attach it on a second email (large file)."

Ecology thanks the commenter. We appreciate your concerns and share your desire for healthy air quality.

Concern about smoke from facility

The pictures show a plume coming out of the roof of the Intalco aluminum smelter's potlines. All but one picture shows the plume meandering to the east-northeast (ENE) of the facility. In one of the pictures, the plume is heading east and then south. These pictures reflect our understanding of plume behavior during periods of light onshore winds. The plume in the picture above (Figure 1) is over the area where Ecology has proposed to establish two new ambient air monitors for sulfur dioxide (SO_2) pollution. The SO_2 monitoring is required by the Environmental Protection Agency to evaluate the area's levels of SO_2 pollution and compliance with the 2010 SO_2 National Ambient Air Quality Standard (NAAQS). Based on air pollution dispersion modeling, Ecology believes that the highest SO_2 concentrations occur in the direction of the plume depicted in the pictures under a west south westerly, onshore, wind pattern. Ecology finds that the submitted pictures support the locations of the proposed SO_2 monitors.

It is worth noting that in one Figure 1, a plume from Philips 66 refinery is going straight up while Intalco's plumes are headed ENE. This could be explained by the fact that Philips 66 stacks are much taller and run hotter allowing for more plume rise.

The pictures are taken against the sun (backlit), which distorts the color of the pot lines plume and makes it difficult to evaluate its components. Based on the past observations, the pot lines plume is a mixture of semi-volatile hydrocarbons and SO_2. If the pot lines plume is viewed with the sun at the observer's back, it should be bluish white and nearly transparent.

Emissions of sulfur compounds occur due to combustion of sulfur-containing fuels. This sulfur oxidizes to sulfur dioxide (SO_2) during the combustion process, and then converts to sulfate compounds (SO_4^{2-}) in the atmosphere. The sulfates formed in the atmosphere are called secondary aerosols, and together with other secondary aerosols and primary fine particulate air pollutants, make what is called fine particles pollution ($PM_{2.5}$). Elevated levels of sulfates and $PM_{2.5}$ in the air can aggravate respiratory symptoms and increase the risk of cardio-pulmonary disease. Additionally, sulfates are particularly effective in degrading visibility, and, due to fact that they are usually acidic, can harm ecosystems and damage materials and property.

The conversion of SO_2 to sulfates can occur comparatively rapidly under high relative humidity conditions. Relative humidity on the evening of May 1, 2014, at the time some of the pictures were taken, was between 65%-80%, with light and variable winds. Some sulfate is likely to have formed within the plume as a result.

Ecology has evaluated data collected over the last nine years at the fine particle monitors located downwind of the smelter.[1] The monitors continuously show levels of $PM_{2.5}$ that are considerably below the current federal air quality standard for fine particles. Based on the available

[1] The public can find information about location of air quality monitors in Washington and air quality monitoring data on Ecology's website at: https://fortress.wa.gov/ecy/enviwa/.

monitoring data, the area is designated attainment (meeting the standard) for the 2006 $PM_{2.5}$ NAAQS.

The commenter notes that there is a white dust "on the buildings that is around each of the air vents." The white dust is generated from mist eliminators on the wet scrubbers. Most of the water coming off the mist eliminators is captured via gutters and routed back into the wet scrubber system. The mist that is not captured generates the white dust when it dries.

Intalco's wet scrubber operators wash the mist eliminators and the area surrounding the mist eliminators approximately every 15 days.

The primary constituents of the white dust are aluminum (58%), sodium (18%), fluoride (17%), calcium (2%), magnesium (2%), iron (1%), silicon (1%), and sulfur (1%).

Intalco's NPDES permit requires them to monitor the water quality of their process and stormwater discharges. Intalco is required to meet permit limits for contaminants in those discharges. Federal and state regulations require that effluent limits in an NPDES permit be either technology based or water quality based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. They are either set by EPA and published as a regulation, or developed by Ecology on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).

- Water quality-based limits are calculated so that the effluent will comply with the most stringent of the following standards for the respective parameters of concern: Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.36).

Concern about dust from ships

Additionally, the commenter requested information about a possibility for bauxite dust deposition on the bottom of the bay in the area where ships load and unload materials for the smelter's operations.

Other people have expressed concern about alumina ore (called bauxite dust by the commenter) fugitive emissions that may be generated as alumina is transported from a ship's hold to the conveyor and the impacts they may have on the local marine environment. Based on those concerns Ecology issued Agreed Order No. 10887 on August 19, 2014. A copy of the order is included below. The order required Intalco to evaluate the impact of historical fugitive alumina emissions on local benthic communities. Intalco completed the study in September 2015 and submitted the findings in a draft report titled "Tier 1 Assessment Report Fugitive Alumina Emissions Study" on March 15, 2016. You may request this document by e-mailing Judy Schwieters at judy.schwieters@ecy.wa.gov. Intalco concluded the data demonstrates that fugitive emissions from alumina unloading operations do not have the potential to impact local benthic communities and further study is not warranted.

Ecology is reviewing the report and will determine if additional study is necessary. The commenter may request the final report from Ecology when it becomes available.

Intalco has implemented a number of best management practices (BMPs) and made significant improvements to the function and operation of the clamshell used to load/unload the alumina to minimize fugitive emissions. Intalco's water permit requires them to use best management practices when unloading alumina ore to minimize the release of fugitive alumina emissions to the Strait of Georgia. The facility is required to develop a Fugitive Alumina Pollution Prevention Plan. The plan must include existing BMPs and those specified in Condition S11 of the permit <https://fortress.wa.gov/ecy/industrial/UIPermit/WaterPermits.aspx>. Intalco must submit the plan to Ecology for review by August 1, 2016, and implement it within 60 days of Ecology's approval.

Ebio, Tina (ECY)

From: Larry McCarter <rdslarry@mac.com>
Sent: Wednesday, June 08, 2016 6:40 AM
To: Caudill, Anya (ECY)
Subject: Alcoa Aluminum Smelter in Whatcom County

To Whom It May Concern:

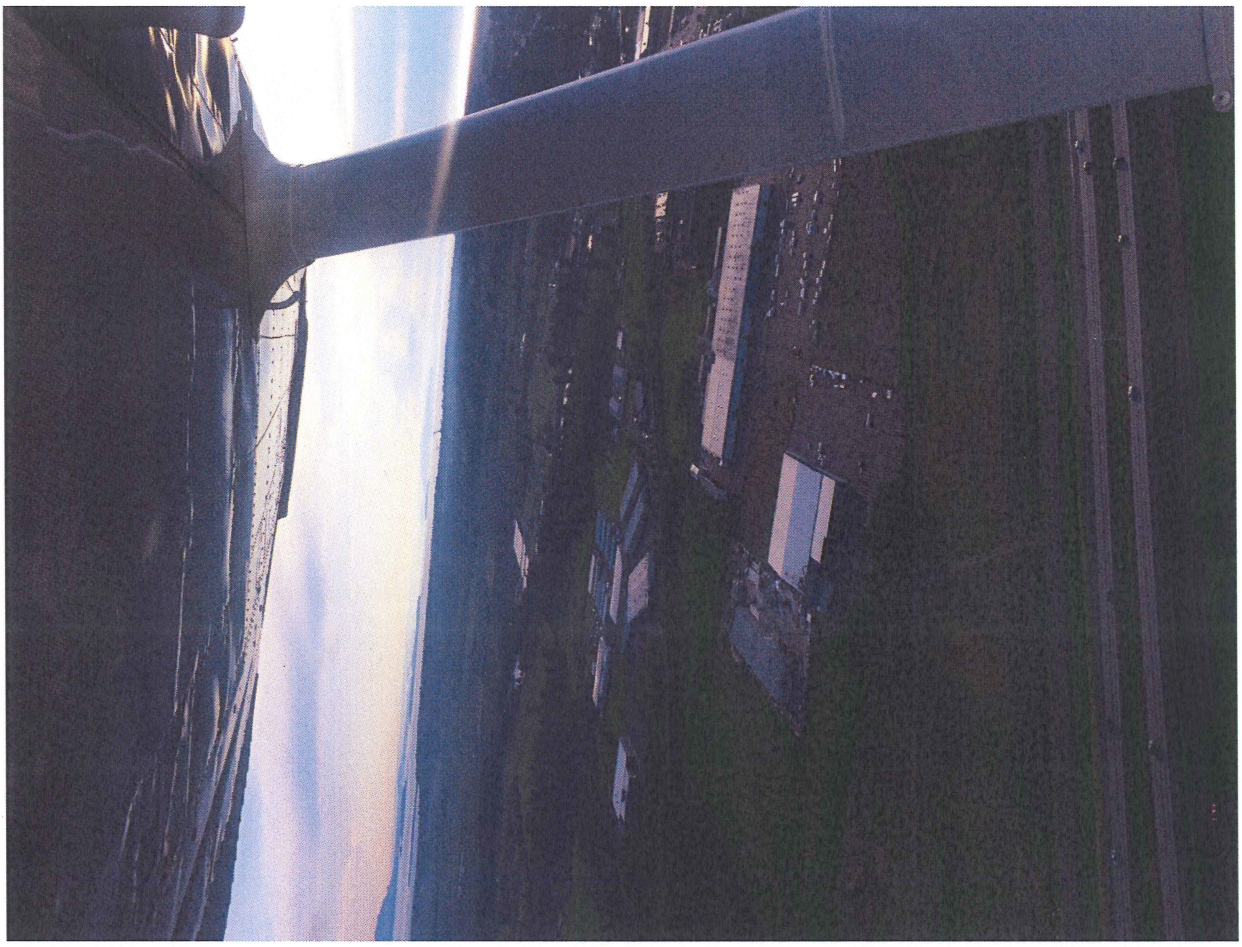
I wish to comment that the Alcoa smelter emits a light white smoke that can be seen every day the wind is somewhat calm and the evening sun is out. What is in this smoke? I also see dust from the Ships as they unload product for the smelter and a photo of that is attached as well. These events happen all the time.

I wish to comment by submitting these photos that represent what I see every time I fly in calm, sunny, evening conditions over the smelter. I have never known what I am looking at and I think we should all know what we are breathing, apparently everyday.

Additionally, there are photos of the dust created when they offload the ships. I am told the ocean bottom surrounding the dock is at least one foot thick of this bauxite dust. IS this possible?

What is the white dust on the buildings that is around each of the air vents? I have a mini video I took of the smoke and will attach it on a second email (large file).

Larry McCarter
212 Hawthorn Road
Bellingham, WA 98225
360.739.4843



Sent from my iPhone

Ebio, Tina (ECY)

From: Larry McCarter <rdslarry@mac.com>
Sent: Wednesday, June 08, 2016 6:58 AM
To: Caudill, Anya (ECY)
Subject: Whatcom County Smelter Pictorial Comment

To Whom It May Concern:

These photos should be in the record and you regulators should respond in a helpful, constructive manner for Alcoa. These conditions persist today. The smoke occurs in all moisture and temperature conditions but can only be seen with the sun as it settles into another good night.

Plz, we need scientific assurances that these emissions are all ok for all of Whatcom County to breathe whenever the wind blows from the North West.

Larry McCarter
212 Hawthorn Road
Bellingham, WA 98225

Sent from my iPad

Begin forwarded message:

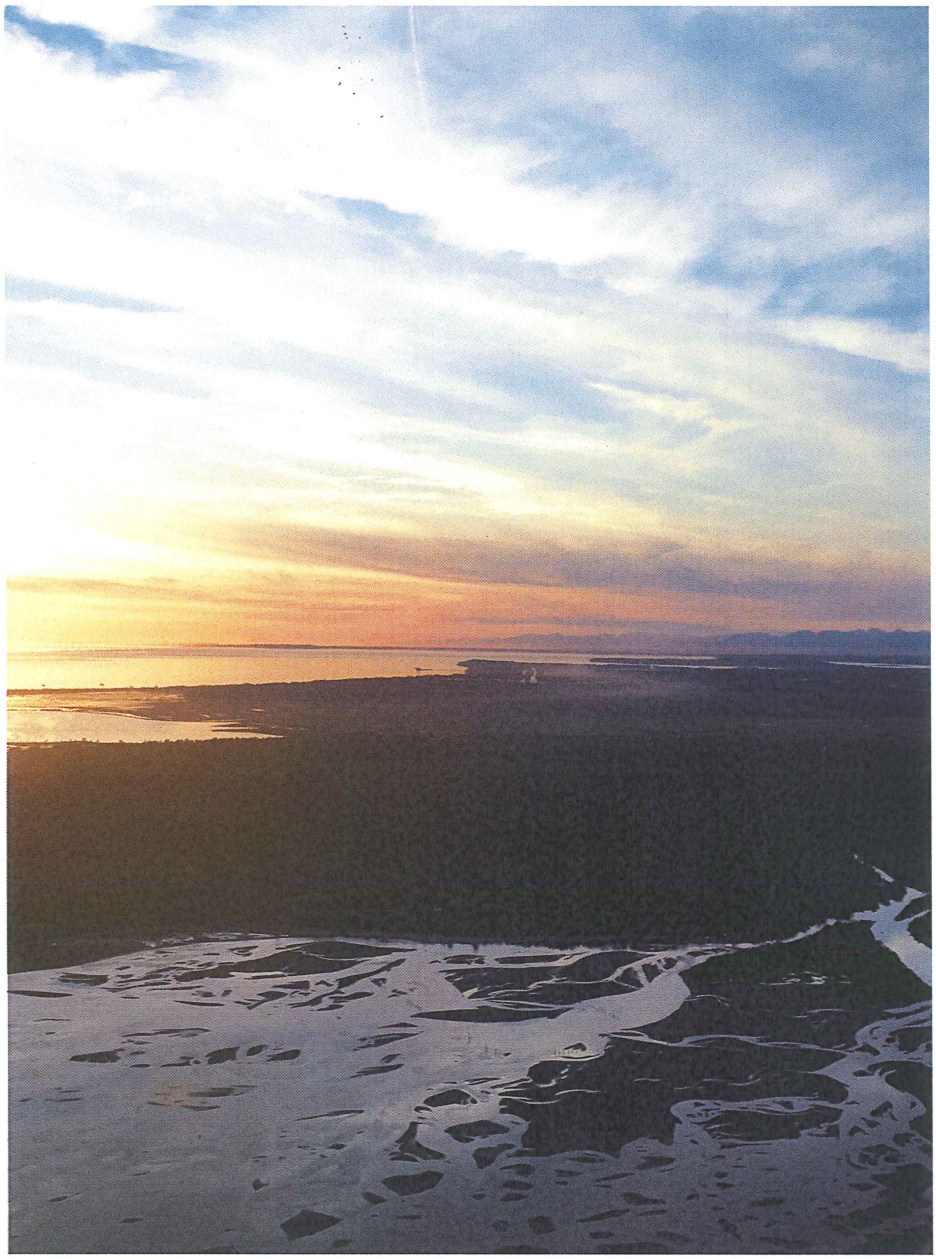
> **From:** Larry McCarter <rdslarry@mac.com>
> **Date:** May 2, 2014 at 2:39:51 PM PDT
> **To:** "info@nwcleanair.org" <info@nwcleanair.org>
> **Subject: May 1, 2014**
>
> These are photos I took of Intalco yesterday.
> What is in this smoke?
>
> Larry McCarter
> 3607394843

Sent from my iPad

Ebio, Tina (ECY)

From: Larry McCarter <rdslarry@mac.com>
Sent: Friday, June 10, 2016 7:54 AM
To: ECY RE AQComments
Cc: Ragan, Mike (ECY); Schwieters, Judith (ECY); Fritz, Angela (ECY)
Subject: Re: Alcoa Aluminum Smelter in Whatcom County

Here is another photo from a few days ago (I think, not too sure) but it shows the persistence of the smoke and how the wind will carry it, this time east and then to the south, towards Bellingham City Center.



Sent from my iPad

On Jun 8, 2016, at 4:21 PM, ECY RE AQComments <AQComments@ECY.WA.GOV> wrote:

> Dear Mr. McCarter:
>
> Thank you for submitting your comments, pictures and one video.
>
> Per our phone conversation today, I am confirming that you are not requesting a comment period on the Agreed Order that requires the facility to install and operate new monitoring sites for sulfur dioxide (SO_2). Your comments will be entered as comments on Ecology's 2016 Ambient Air Monitoring Network Report. This report identifies locations of the two new SO_2 monitors around the smelter and is currently open for public comment. After the comment period ends, this plan will be submitted to EPA for review and approval. For more information about the report, please contact Mike Ragan.
>
> I also forwarded your comments to Judy Schwieters, the permitting engineer overseeing the facility, for a follow up on additional questions you asked in your comments that are outside of the scope of the sulfur dioxide monitoring effort. I would like to note that Ecology is the responsible agency for the smelter. The Northwest Clean Air Agency does not regulate this facility and I will not be forwarding your comments to them.
>
> Thank you again for taking the time to provide your comments to us. Please don't hesitate to call or email me with any follow up questions.
>
> <image006.jpg><image007.jpg>
>
> Anya Caudill
> Environmental Planner
> (360) 407-6630 | (360) 791-5499
> anya.caudill@ecy.wa.gov
>
> Air Quality Program | Washington State Department of Ecology

From: Larry McCarter [mailto:rdslarry@mac.com]
Sent: Wednesday, June 08, 2016 6:40 AM
To: Caudill, Anya (ECY) <ACAU461@ECY.WA.GOV>
Subject: Alcoa Aluminum Smelter in Whatcom County

To Whom It May Concern:

I wish to comment that the Alcoa smelter emits a light white smoke that can be seen every day the wind is somewhat calm and the evening sun is out. What is in this smoke? I also see dust from the Ships as they unload product for the smelter and a photo of that is attached as well. These events happen all the time.

I wish to comment by submitting these photos that represent what I see every time I fly in calm, sunny, evening conditions over the smelter. I have never known what I am looking at and I think we should all know what we are breathing, apparently everyday.

Additionally, there are photos of the dust created when they offload the ships. I am told the ocean bottom surrounding the dock is at least one foot thick of this bauxite dust. IS this possible?

What is the white dust on the buildings that is around each of the air vents? I have a mini video I took of the smoke and will attach it on a second email (large file).

Larry McCarter
212 Hawthorn Road
Bellingham, WA 98225
360.739.4843

<image001.jpg><image002.jpg>

Sent from my iPad

Begin forwarded message:

> **From:** Larry McCarter <rdslarry@mac.com>
> **Date:** May 19, 2015 at 6:54:30 AM PDT
> **To:** "raina.clark@alcoa.com" <raina.clark@alcoa.com>
> **Cc:** Lee First <leef@re-sources.org>
> **Subject: Monday's Flight**
>
> These are new iPhone shots I took yesterday. You can see a haze that extends all the way to the airport.
>
> What chemicals are in this smoke?
>
> Yes I do remember you :-)
>
> and again I am not stalking Alcoa.
>
> But I don't like pollution.
>
> I am out of town the rest of this week but maybe next week we can meet and I receive a science lesson from you!
>
> <image003.jpg>
>
> <image004.jpg>
>
> <image005.jpg>
>
> Sent from my iPhone

<Judith Schwieters.vcf>

<Ragan Mike (ECY).vcf>

References

1. Code of Federal Regulations, Title 40, Part 58, Appendix A, B, C, D & E.

2. Code of Federal Regulations, Title 40, Part 50.

3. Code of Federal Regulations, Title 40, Part 53.

4. Code of Federal Regulations, Title 40, Part 58.

5. U.S. EPA Revised Requirements for Designation of Reference and Equivalent Methods for PM2.5 and Ambient Air Quality Surveillance for Particulate Matter -Final Rule. 40 CFR Parts 53 and 58. Federal Register, 62 (138):38763-38853. July 18, 1997

6. U.S. EPA Revisions to Ambient Air Monitoring Regulations – Final Rule. 40 CFR, Parts 53 and 58. Federal Register 7: 61236. October 17, 2006

7. U.S. EPA National Ambient Air Quality Standards for Particulate Matter – Final Rule. 40 CFR Parts 50, 51, 52, 53, and 58. January 15, 2013

8. Guidance for Network Design and Optimum Site Exposure for PM2.5 and PM10, EPA-454/R-99-022, December 15, 1997.

9. SLAMS/NAMS/PAMS Network Review Guidance, EPA-454/R-98-003, March 1998.

10. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), EPA-450/4-87-007, May 1987.

11. Guideline on Ozone Monitoring Site Selection, EPA-454/R-98-002, August 1998.