Guidance on the Data Certification Process for Calendar Year 2014 Data

Certifying Agencies vs. PQAOs

Certifying agencies do not necessarily equate to PQAOs and yet a number of summary parameters use data aggregated at the PQAO level, for example:

- NPAP Data (valid audits and NPAP bias)
- Collocation Data (PM10, Pb and PM2.5 completeness and CV)
- PEP Data (PM2.5 and Pb completeness and bias)
- Pb Analysis Audit Data (completeness, bias)

The data in the list above are aggregated and assessed at the PQAO level. Monitoring organizations that are part of a larger PQAO but decide to certify the sites/data within their "certifying agency" will see the same results for the parameters listed above as other monitoring organizations within the PQAO. Therefore, AQS recommended flags for these parameters will be consistently attributed to every monitoring organization within the PQAO. For example if there are three distinct monitoring organizations within a PQAO and organization #1 has 4 PM10 sites, organization #2 has 3 PM10 sites, and organization #3 has 7 PM10 sites, the collocation summary for each organization (if each organization decides to certify their own data) will identify a total of 14 sites requiring 2 collocated monitors for the PQAO (14*0.15=2.1). Similar to the AMP-256 report, the AMP-600 will then determine the percent complete and the precision estimate for the PQAO.

Evaluation of PEP and NPAP Data Suspended for CY2014 Certification.

OAQPS has had some key retirements in 2014 as well as turnover to a new QA contractor. These changes have slowed and in some cases stopped the reporting of NPAP, PM2.5 PEP and Pb-PEP data to AQS. Therefore, the AMP600 will report completeness and bias data of any PEP values reported to AQS but will not perform any automated evaluations of that information.

1-point QC Check Completeness.

It was suggested that the evaluation of the 1-point QC check should be more detailed since there were findings that monitoring organizations were not be performing checks every two weeks but at the end of the year "making up" missed checks by performing checks more frequently. The CY2013 AMP256 and AMP600 reports simply counted all the 1-point QC checks over the whole year and divided that number by 26. For CY 14 the 1-point QC completeness data will be evaluated in the following manner:

1. Count the number of checks in each 14 day interval starting with the Jan 1-14 interval. For each 14 day interval, multiple checks will only count as one.
2. Divide the total number of checks in #1 by 26

For certification, a green Y is $\geq$ 75%. That means a monitoring organization could miss 6, 14 day intervals (meaning a check past the 14-day interval) and still get a green Y. For a yellow flag, they could miss 9, 14-day intervals and get a warning. Missing 10, 14-day intervals will elicit an N flag which seems very reasonable in light of the CFR requirement. We have received some suggestion to build the intervals around weekends rather than staring on January 1-14. For 2015 data certification, we will review the current procedure to determine the most equitable evaluation of this data.

Gaseous Criteria Pollutants					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100* Number of hourly obs/number of hours in monitor sample period
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
1-Point QC Completeness	75%	≥75%	65-75%	<65%	Based on 26, 1-point QC for a year. Calculated based on the number of days the monitor operated.

Comparing the AMP-256 to AMP-600

In previous certification periods there were a number of discrepancies between the AMP256 report and the AMP600. The following fixes have been made so both reports should provide the same information:

Collocation completeness for PM10 - The AMP-256 now only counts count sites that have manual samplers as the primary monitor at the site. This has now been repaired so the AMP256 and the AMP 600 will only count sites where a manual sampler is the primary sampler. However there may be times when a site had a manual sampler as primary for a period of time and switched to a continuous monitor. These sites will be included in the manual count if the manual sampler operated as the primary for any time during the year.

Collocation for PM2.5- The appendix A regulation requires that a PQAO collocate 15% of the monitors in each method designation. The AMP256 has been revised to assess whether there is 15% collocation for each method designation of only the primary monitors and should therefore match the result in the AMP-600 report. However there may be case where more than one method designation was used at a site as a primary monitor. Any method designation used as a primary at any time during the year will be counted towards the collocation evaluation. So if one ran a method 118 for 6 months and a 143 for 6 months at the same site, the AMP-600 will expect to see collocation for each method designation.

Flow rate criteria- For semi-annual flowrates the AMP-256 acceptance criteria requires two audits that are within 5-7 months from each other. The "Criteria Met" field in the AMP-256 is based on the two audits being within this time period, however completeness will still show 100% on the AMP-256 even if the criteria is not met. The AMP-600 uses the same criteria for the completeness estimate but will code the field as yellow if there are a least two audits in two quarters, without meeting the 5-7 month rule, and red (recommended "N" flag) if only 1 audit is accomplished in the year (50% complete).

How Does Data in the Summary Section of the AMP-600 Reports Get Used at the Site Level?

There has been some question on how the certification flags are generated for the "PQAO Criteria Met" fields. Below provides some explanation and examples.

Gaseous Pollutants

QAPP Approval -The QAPP Approval Field is based on QAPP approval dates supplied from the monitoring organizations to the EPA Regions. Figure 1 provides an explanation on how flags are set at the site pollutant level. The QAPP approval date (if one exists) will be displayed above the site details but then transferred down to the site level. The QAPP approval field is implemented in the same manner for all pollutants.

QAPP Approval

QAPP Approval - If a QAPP approval date is in AQS it will appear of PQAO Pollutant Page
- If no approval date or date > 10 years old, will be missing a date and all sites Red "N"
- If date between 5-10 years all sites yellow "Y"
- If date ≤ 5 years all sites green "Y"

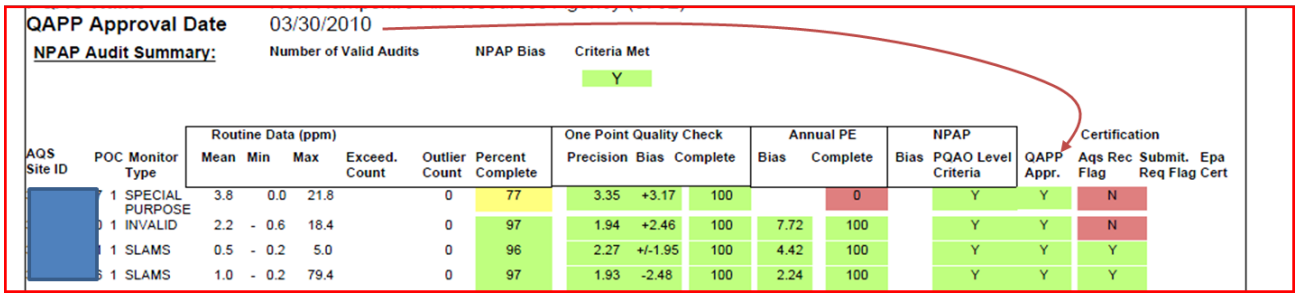


Figure 1

PM2.5 Pollutant PQAO Level Criteria

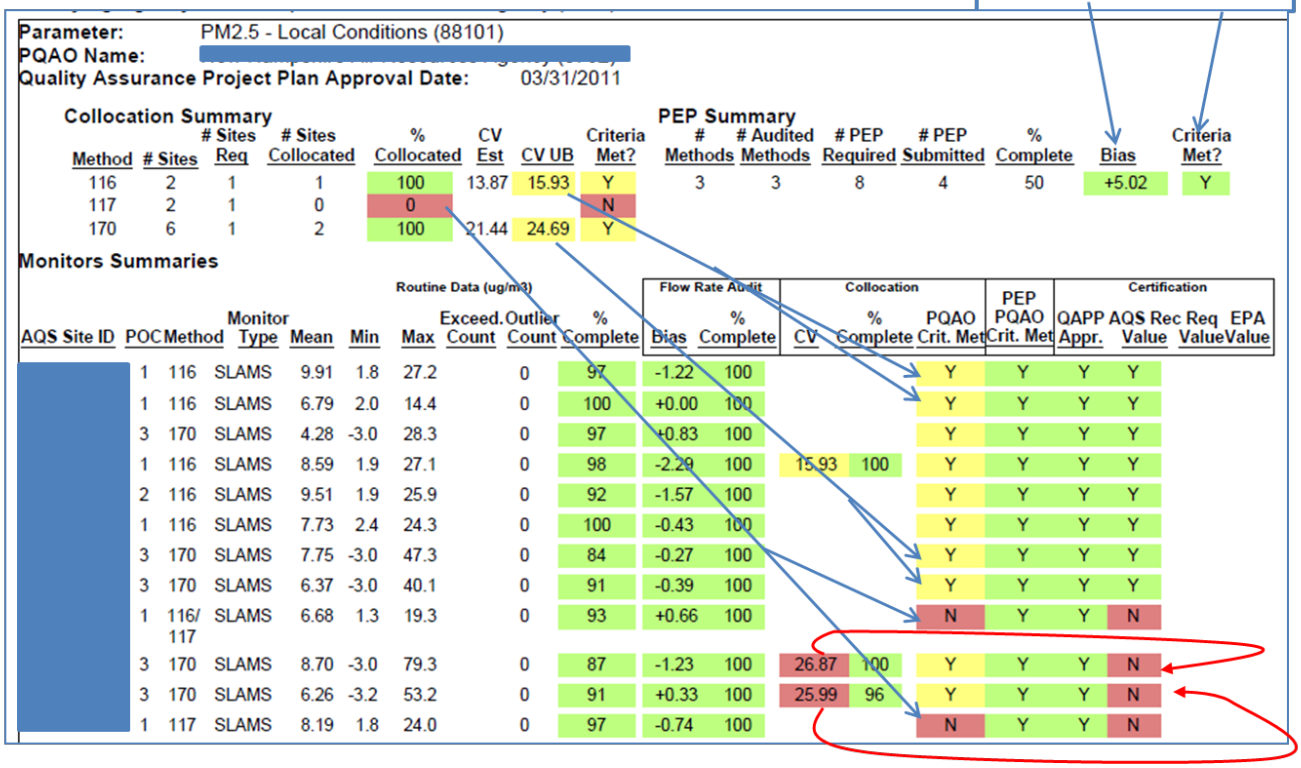
PM2.5 Collocation- A number of interactions occur with collocation data. Figure 2 represents a PM2.5 AMP-600 report. First, each method designation that was reported as a primary monitor for a site will be listed in the collocation summary. Data from this summary should be the same information one would see on the AMP-256 report, at least for the collocations that occurred. As mentioned earlier, the AMP-256 now counts just those that are considered the primary at the site so both results should be similar. However, there will be cases where more than one method designation may have been reported for a site and both method designations will be identified for collocation (see Fig 2 116/117). "PQAO Criteria Met" for collocation is based on the completeness summary statistic **and** the precision estimate (CV-UB). In the example in Fig. 2, method 116 had 100% completeness and a PQAO precision estimate of 15.93 which was in the warning limit. Therefore, all sites using 116 as the primary are color coated yellow for warning. Sites that had a primary method designation of 117 did not have collocation data available so completeness was 0% and the sites using 117 where flagged as N. Also notice that individual collocated site/monitor data for the 2 collocated 170 sites were greater than 25% and were given a AQS recommended "N" flag so even though at the PQAO level the estimates was less than 25% .

PM2.5 Bias- Bias data is derived from the PEP and is aggregated at the PQAO level. **However for CY2014 data the AMP600 will report the information but will not flag this data in the report.**

PQAO Level "Criteria Met" Flags
For Collocation and PEP , AQS Recommended flags are generated at the PQAO level and then "transfered" back to each site

Collocation
based on CV, and completeness and is also associated with method designation

Bias
based on bias estimate, **not** completeness. Will not be implemented in CY14 Certification



Parameter: PM2.5 - Local Conditions (88101)
PQAO Name: [redacted]
Quality Assurance Project Plan Approval Date: 03/31/2011

Collocation Summary

Method	# Sites	# Sites Req	# Sites Collocated	% Collocated	CV Est	CV UB	Criteria Met?
116	2	1	1	100	13.87	15.93	Y
117	2	1	0	0			N
170	6	1	2	100	21.44	24.69	Y

PEP Summary

# Methods	# Audited Methods	# PEP Required	# PEP Submitted	% Complete	Bias	Criteria Met?
3	3	8	4	50	+5.02	Y

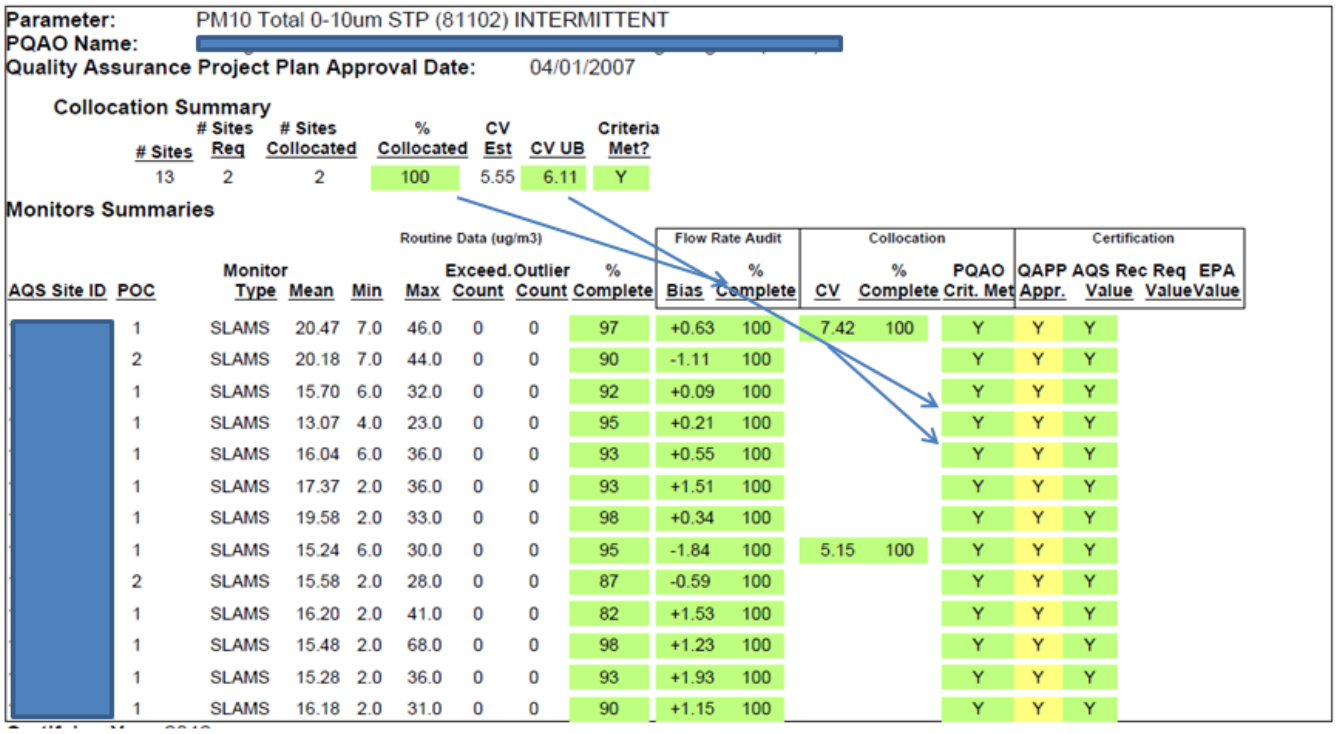
Monitors Summaries

AQS Site ID	POC	Method	Monitor Type	Routine Data (ug/m3) Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Flow Rate Audit Bias	% Complete	Collocation CV	% Complete	PQAO Crit. Met	PEP PQAO Crit. Met	Certification QAPP Appr.	AQS Rec Req Value	EPA Value
[redacted]	1	116	SLAMS	9.91	1.8	27.2		0	97	-1.22	100			Y	Y	Y	Y	
	1	116	SLAMS	6.79	2.0	14.4		0	100	+0.00	100			Y	Y	Y	Y	
	3	170	SLAMS	4.28	-3.0	28.3		0	97	+0.83	100			Y	Y	Y	Y	
	1	116	SLAMS	8.59	1.9	27.1		0	98	-2.29	100	15.93	100	Y	Y	Y	Y	
	2	116	SLAMS	9.51	1.9	25.9		0	92	-1.57	100			Y	Y	Y	Y	
	1	116	SLAMS	7.73	2.4	24.3		0	100	-0.43	100			Y	Y	Y	Y	
	3	170	SLAMS	7.75	-3.0	47.3		0	84	-0.27	100			Y	Y	Y	Y	
	3	170	SLAMS	6.37	-3.0	40.1		0	91	-0.39	100			Y	Y	Y	Y	
	1	116/117	SLAMS	6.68	1.3	19.3		0	93	+0.66	100			N	Y	Y	N	
	3	170	SLAMS	8.70	-3.0	79.3		0	87	-1.23	100	26.87	100	Y	Y	Y	N	
	3	170	SLAMS	6.26	-3.2	53.2		0	91	+0.33	100	25.99	96	Y	Y	Y	N	
	1	117	SLAMS	8.19	1.8	24.0		0	97	-0.74	100			N	Y	Y	N	

Figure 2

PM10 Pollutant PQAO Level Criteria

PM10 Collocation-PM10 collocation is only required for manual (intermittent) samplers In addition, CFR does not distinguish method designations for PM10 so all primary intermittent samplers are aggregated at the PQAO and 15% of the sites are required to be collocated. Therefore, "Method" is not identified in the summary line of Fig. 3. In the example below, similar to PM2.5, both collocation completeness at the summary level and the CV_UB are used for the Collocation "PQAO Criteria Met" column at the site/monitor level. Data from this summary should be the same information one would see on the AMP-256 report. So in the example in Fig. 3, both the collocation and CV_UB were acceptable. The QAPP approval date is between 5-10 years old so it is providing a site/monitor level warning.



Parameter: PM10 Total 0-10um STP (81102) INTERMITTENT
PQAO Name: [redacted]
Quality Assurance Project Plan Approval Date: 04/01/2007

Collocation Summary

# Sites	# Sites Req	# Sites Collocated	% Collocated	CV Est	CV UB	Criteria Met?
13	2	2	100	5.55	6.11	Y

Monitors Summaries

			Routine Data (ug/m3)						Flow Rate Audit		Collocation			Certification		
AQS Site ID	POC	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias	% Complete	CV	% Complete	PQAO Crit. Met	QAPP Appr.	AQS Rec Req Value	EPA Value
[redacted]	1	SLAMS	20.47	7.0	46.0	0	0	97	+0.63	100	7.42	100	Y	Y	Y	
	2	SLAMS	20.18	7.0	44.0	0	0	90	-1.11	100			Y	Y	Y	
	1	SLAMS	15.70	6.0	32.0	0	0	92	+0.09	100			Y	Y	Y	
	1	SLAMS	13.07	4.0	23.0	0	0	95	+0.21	100			Y	Y	Y	
	1	SLAMS	16.04	6.0	36.0	0	0	93	+0.55	100			Y	Y	Y	
	1	SLAMS	17.37	2.0	36.0	0	0	93	+1.51	100			Y	Y	Y	
	1	SLAMS	19.58	2.0	33.0	0	0	98	+0.34	100			Y	Y	Y	
	1	SLAMS	15.24	6.0	30.0	0	0	95	-1.84	100	5.15	100	Y	Y	Y	
	2	SLAMS	15.58	2.0	28.0	0	0	87	-0.59	100			Y	Y	Y	
	1	SLAMS	16.20	2.0	41.0	0	0	82	+1.53	100			Y	Y	Y	
	1	SLAMS	15.48	2.0	68.0	0	0	98	+1.23	100			Y	Y	Y	
	1	SLAMS	15.28	2.0	36.0	0	0	93	+1.93	100			Y	Y	Y	
	1	SLAMS	16.18	2.0	31.0	0	0	90	+1.15	100			Y	Y	Y	

Figure 3

Lead Parameters

There are currently two Pb parameters; Pb-TSP and Pb-PM10. They will be discussed separately.

Pb-TSP- Pb-TSP (Fig. 4) is a more established program**.** Similar to the PM parameters, both the collocation completeness and the precision estimate (CV-UB) will be used in the "Collocation PQAO Criteria Met" column. The analysis audits are the audits described in 40 CFR Part 58 App A section 3.3.4.2. Similar to the collocation requirements, both the completeness and the bias estimate will be used in the "Lead Analysis Criteria Met" column at the site monitor level. As mentioned in the introduction, with the development of new QA transactions, and the award of a new QA contract, EPA has had some difficulty in reporting Pb-PEP data for 2014 and will not use this information in certification evaluations.

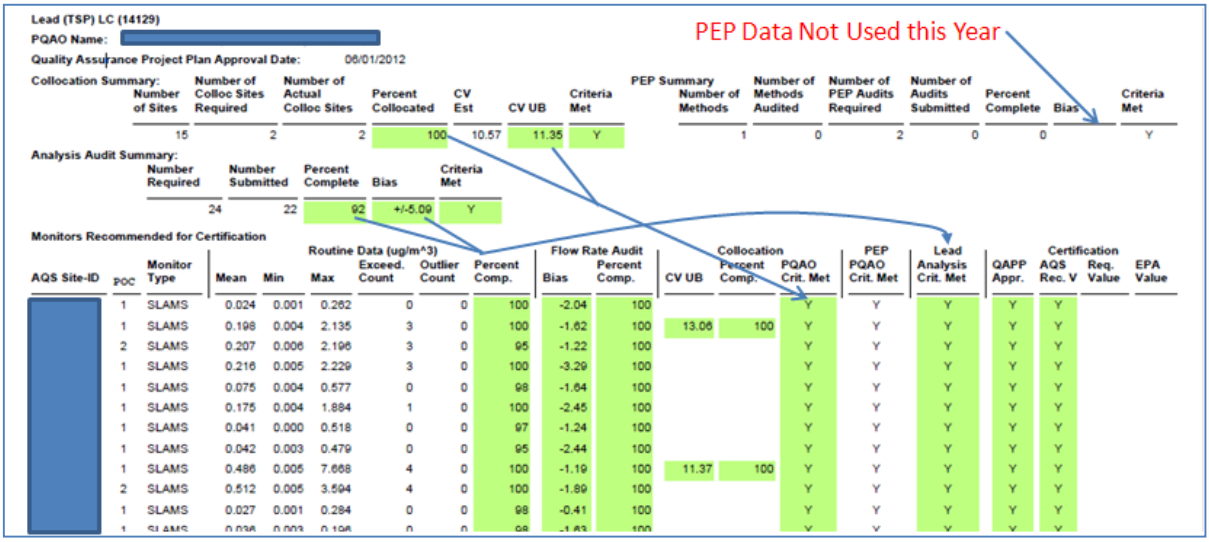


Figure 4

Pb-PM10- Since there are different implementation requirements for sampling Pb-PM10 at source and non-source oriented sites, collocation and PEP are not required at every PQAO implementing this parameter. Due to the complications with programming these requirements, collocation and PEP evaluations will not be used for certification on a site/monitor level for CY2014 data. However if values (as seen in Fig. 5) are available, they will be reported. Lead analysis audit data will used for certification.

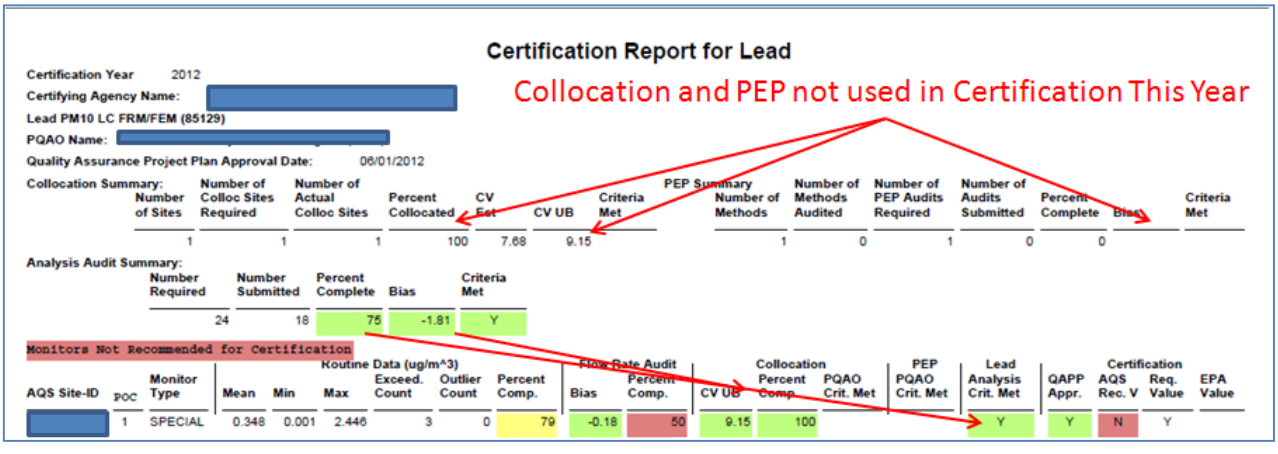


Figure 5

Attachment 1

Criteria That Will Generate Green (Acceptable) Warning (Yellow) and "N" Flags (Red)

Notes:

1. **Blue shaded rows are evaluations that will be reported (when data is available)but not used in certification flag settings**
2. **One Red for any monitor will elicit a AQS recommended "N" flag**
3. **Three warnings for any monitor will elicit an AQS recommended "N" flag**
4. **Outlier reports will not be used in 2012 reporting.**

Assessment	Current CFR Requirement or Guidance	Green (Acceptable)	Yellow (Warning)	Red (Recommend N Flag)	Comments
Technical Systems Audit	PQAO every 3 years	TSA within 3 years	TSA within 4 years	TSA > 5 years	Not a monitoring Org responsibility. Will be reported on summary page not by pollutant
Gaseous Criteria Pollutants					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100* Number of hourly obs/number of hours in monitor sample period
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
1-Point QC Completeness	75%	≥75%	65-75%	<65%	Based on 26, 1-point QC for a year. Calculated based on the number of days the monitor operated.
1-Point QC Precision	7% O3, 10% others	≤7% O3, 10% others	8-20% O3 11-25% others	> 20% O3 > 25% others	Based on all valid 1-point QC checks in AQS for the year. Value should reflect AMP-256 value
1-Point QC Bias	±7% O3, ±10% others	≤ ±7% O3, ≤ ±10% others	± 8-20% O3 ±11-25% others	> ±20% O3 > ±25% others	Based on all valid 1-point QC checks in AQS. Value should reflect AMP-256 value
Annual PE Completeness	1 PE/year 3 audit levels	1 PE/year 3 audit levels	1 PE/year 2 audit levels	No PE or 1 audit level	Will not count more than one actual value in an audit level. For example, two audit in one level count as 1 audit level.
Annual PE Bias O3 , SO2 , NO2 CO	≤ ±1.5 ppb / ±15% ≤ ±0.03 ppm/ ± 15%	≤ ±1.5 ppb / ±15% ≤ ±0.03 ppm/ ± 15%	≤ ± 1.6-3.0 ppb / ± 16-25% ≤ ± 0.04-0.06 ppm/ ± 16-25%	> ±3.0 ppb / ± 25% > ±0.06 ppm/ ± 25%	Average PD of all PE values for the monitor
NPAP Audit Completeness -PQAO	20% of sites in PQAO	20% of sites in PQAO	10-19% of sites in PQAO	<10% of sites in PQAO	Not a monitoring Org responsibility. Will be marked as "Y"
NPAP Bias	≤ ±10% O3 ≤ ±15% others	≤ ±10% O3 ≤ ±15% others	± 11-20% O3 ±16-25% others	> ±20% O3 > ±25% others	median PD for all values at a site and median PD for PQAO level estimate
NPAP Audit Completeness -Site	4 levels	4 levels	2-3 levels	≤1 level	Not a monitoring Org responsibility
Outliers					Not implemented in 2014
PM2.5 Criteria					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100 * number of creditable samples/number of scheduled samples in monitor sample period
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
Flow Rate Audit Completeness	2 /year every 6 months	2/year every 5-7 months or 3 or 4 with one audit in 3 or 4 quarters	2 across 2 quarters	1 audit	Semi-annual flow rate audits. Based on how long sampler operated. If sampler operates <9 months at least 1 is expected. If operated >9 months two audits expected.
Flow Rate Audit Bias	± 4% of transfer standard ± 5% from design	≤ ± 4% of transfer standard ≤ ± 5% from design	± 5-6% of transfer standard ± 6-7% from design	> ± 6% of transfer standard > ± 7% from design	design =design flow rate Average PD for audits at monitor level Value should reflect AMP-256 value

Assessment	Current CFR Requirement or Guidance	Green (Acceptable)	Yellow (Warning)	Red (Recommend N Flag)	Comments
Collocation Completeness	75%	≥75%	65-74%	<65%	By method designation Summary level= average of completeness of site level values Site level = number of reported observations /30 Based on how long sampler operated
Collocation Precision	10%	≤ 10%	11-25%	>25%	By method designation Same statistics as AMP-256 for summary level and site level. Value should reflect AMP-256 value
PM2.5 PEP Completeness	5 or 8	5 or 8	3-4 or 6-7	< 3 or 6	Not a monitoring Org responsibility
PEP Bias	±10%	≤ ±10%	± 11-30%	>± 30%	Value should reflect AMP-256 value
Outliers					Not implemented in 2014
PM10 Continuous Methods					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100 * number of valued strata (days per collection frequency) / total number of strata
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
Flow Rate verification Completeness	75%	≥75%	65-74%	<65%	12 audit per year, based on how long sampler operated
Flow Rate Verification Bias	± 7% of transfer standard	≤ ± 7% of transfer standard	± 8- 9% of transfer standard	>± 9% of transfer standard	Average of percent differences. Value should reflect AMP-256 value
Flow Rate Audit Completeness	2 /year every 6 months	2/year every 5-7 months or 3 or 4 with one audit in 3 or 4 quarters	2 across 2 quarters	1 audit	Semi-annual flow rate audits Based on how long sampler operated. If sampler operates <9 months at least 1 is expected. If operated >9 months two audits expected.
Flow Rate Audit Bias	± 7% of transfer standard	≤ ± 7% of transfer standard	± 8-9% of transfer standard	>± 9% of transfer standard	Semi-annual flow rate audits. Value should reflect AMP-256 value Average of percent differences
Outliers					Not implemented in 2014
PM10 Manual Methods					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100 * number of valued strata (days per collection frequency) / total number of strata
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
Flow Rate Audit Completeness	2 /year every 6 months	2/year every 5-7 months or 3 or 4 with one audit in 3 or 4 quarters	2 across 2 quarters	1 audit	Semi-annual flow rate audits Based on how long sampler operated. If sampler operates <9 months at least 1 is expected. If operated >9 months two audits expected.
Flow Rate Audit Bias	± 7% of transfer standard	± 7% of transfer standard	± 8-9% of transfer standard	>± 9% of transfer standard	Semi-annual flow rate audits. Value should reflect AMP-256 value
Collocation Completeness	75%	≥75%	65-74%	<65%	Summary level= average of completeness of site level values

Assessment	Current CFR Requirement or Guidance	Green (Acceptable)	Yellow (Warning)	Red (Recommend N Flag)	Comments
					Site level = number of reported observations /30 Based on how long sampler operated
Collocation Precision	10%	10%	≤ 11-20%	>20%	Same statistics as AMP-256 for summary and site level. Value should reflect AMP-256 value
Outliers					Not implemented in 2014
Pb-TSP					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100 * number of creditable samples/number of scheduled samples in monitor sample period
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
Flow Rate Audit Completeness	2 /year every 6 months	2/year every 5-7 months or 3 or 4 with one audit in 3 or 4 quarters	2 across 2 quarters	1 audit	Semi-annual flow rate audits Based on how long sampler operated. If sampler operates <9 months at least 1 is expected. If operated >9 months two audits expected.
Flow Rate Audit Bias	± 7% of transfer standard	± 7% of transfer standard	± 8-9% of transfer standard	>± 9% of transfer standard	Semi-annual flow rate audits. Value should reflect AMP-256 value
Collocation Completeness	75%	≥75%	65-74%	<65%	Summary level= average of completeness of site level values Site level = number of reported observations /30 Based on how long sampler operated
Collocation Precision	20%	20%	21-30%	>30%	Same statistics as AMP-256 for summary and site level
Pb PEP Completeness	5 or 8	4 or 7	3 or 6	< 3 or 6	Not a monitoring Org responsibility
Pb PEP Bias	±15%	±15%	± 15-25%	>± 25%	Average PD
Analysis Audit Completeness	75%	≥75%	65-74%	<65%	Average completeness by quarter than take average of all 4 quarters
Analysis Audit Bias	10%	10%	≤18%	>18%	Average PD
Outliers					Not implemented in 2014
Pb-PM10					
Routine Data Completeness	75%	≥80%	80-70%	<70%	Based on CFR criteria for data use 100 * number of creditable samples/number of scheduled samples in monitor sample period
QAPP Approval	Approval date within 5 years of current date	Approval date within 5 years of current date	Approval date between 5-10 years	Not approved and/or approval date greater than 10 years	Could be sole reason for "N" flag if QAPP not approved.
Flow Rate Audit Completeness	2 /year every 6 months	2/year every 5-7 months or 3 or 4 with one audit in 3 or 4 quarters	2 across 2 quarters	1 audit	Semi-annual flow rate audits Based on how long sampler operated. If sampler operates <9 months at least 1 is expected. If operated >9 months two audits expected.
Flow Rate Audit Bias	± 4% of transfer standard	≤ ± 4% of transfer standard	± 5-6% of transfer standard	> ± 6% of transfer standard	Semi-annual flow rate. Value should reflect AMP-256 value
Collocation Completeness	75%	≥75%	65-74%	<65%	Summary level= average of completeness of site level values

Assessment	Current CFR Requirement or Guidance	Green (Acceptable)	Yellow (Warning)	Red (Recommend N Flag)	Comments
					Site level = number of reported observations /30 Based on how long sampler operated
Collocation Precision	20%	20%	21-30%	>30%	Value should reflect AMP-256 value
Pb PEP Completeness	5 or 8	5 or 8	3 or 6	< 3 or 6	Not a monitoring Org responsibility
Pb PEP Bias	±15%	±15%	± 16-25%	>± 25%	
Analysis Audit Completeness	75%	≥75%	65-74%	<65%	Based on 24 audits per year
Analysis Audit Bias	10%	10%	≤18%	>18%	Average of percent differences. Value should reflect AMP-256 value
Outliers					not implemented in 2014