

AQS QA Data Handling

2014 EPA Region 3 QA Workshop



- Background
- Input: New QA Transactions
 - Transaction Contents
 - AQS QA Transaction Generator
 - Other Input Mechanisms
- Output: New QA Reports
 - QA Raw Assessment Report
 - QA Data Quality Indicator Report
 - Extract QA Data
- Access control for QA Data
- Questions and Answers



- The monitoring QA requirements are specified in 40 CFR Part 58 Appendix A and related guidance.
- In 2011, the OAQPS Ambient Air Monitoring Group initiated a project to develop QA transactions that more closely match the Appendix A requirements.
- In 2012 and 2013, Mike Papp hosted a workgroup to develop the new QA transactions.
- AQS has been enhanced to fully support these.
- See:
http://www.epa.gov/ttn/airs/airsaqs/manuals/QA_ConceptOfOperations.pdf

New QA Transaction List



- 1-Point QC
- Annual Performance Evaluation
- Flow Rate Verification
- Semi-Annual Flow Rate Audit
- Lead Analysis Audit
- Performance Evaluation Program (PEP)
- National Performance Audit Program (NPAP)
- PM Coarse Flow Rate Verification
- PM Coarse Semi-Annual Flow Rate Audit
- Speciation Flow Rate Verification
- Speciation Semi-Annual Flow Rate Audit
- NATTS Duplicate Assessment
- NATTS Replicate Assessment
- Field Proficiency Test
- Lab Proficiency Test
- Ozone SRP
- Ambient Air Protocol Gas Verification Program
- Definitions:
http://www.epa.gov/ttn/airs/airsaqs/manuals/QA_Transaction_Formats.pdf



- Regulatory Requirement: 40 CFR Part 58 Appendix A § 3.2.1
 - A one-point quality control (QC) check must be performed at least once every 2 weeks on each automated analyzer used to measure SO₂, NO₂, O₃ and CO.
 - The QC check is made by challenging the analyzer with a QC check gas of known concentration (effective concentration for open path analyzers) between 0.01 and 0.10 parts per million (ppm) for SO₂, NO₂, and O₃, and between 1 and 10 ppm for CO analyzers.
 - Report the audit concentration of the QC gas and the corresponding measured concentration indicated by the analyzer. The percent differences between these concentrations are used to assess the precision and bias of the monitoring data

QA Trans. Example: 1-Point QC (2)



No.	Field Name	Description
1	Transaction Type	New transaction type "QA"
2	Action Indicator	1 character code specifying Insert (I), Update (U) or Delete (D)
3	Assessment Type	A label specifying the assessment for which data is being submitted. "1-Point QC"
4	Performing Agency Code	Agency Code of organization performing assessment (optional)
5	State Code / Tribal Indicator	The FIPS state code of the monitor being assessed, or "TT" to indicate that the next field on the transaction is a Tribal code.
6	County Code / Tribal Code	The FIPS County Code of the monitor being assessed. If the previous field on the transaction contains "TT", then the Tribal Code of the monitor being assessed.
7	Site number	Four digit number to uniquely identify site in county.
8	Parameter Code	The AQS parameter code assigned to the monitor in AQS for which the assessment is being performed

No.	Field Name	Description
9	POC	Parameter Occurrence Code: One or two digit number identifying a specific monitor for a parameter at the site.
10	Assessment Date	Date that the assessment was performed
11	Assessment Number	A unique number associated with an assessment performed at a site on a given day. Value should be "1" unless additional same assessments are performed.
12	Monitor Method Code	The sampling methodology of the monitor being assessed.
13	Reported Unit	Units associated with the assessment concentrations (Monitor Concentration and Assessment Concentration)
14	Monitor Concentration	The concentration value provided by the monitor being assessed.
15	Assessment Concentration	The value of the check gas standard concentration.



PM Coarse (86101) is often calculated as the difference between a PM 10 concentration and a PM 2.5 concentration

- A flow assessment requires both the PM 10 and PM 2.5 flow rates
- The new PMc flow transactions allows both to be entered on the same transaction.
- For cases where the sampler measures PMc directly from a single channel, the standard flow transactions are used.

Sampler/Speciation Transactions



For speciation analyses, a single filter is often analyzed for many analytes. New transactions have been created to allow the sampler configuration to be defined, and thereafter the single flow assessment to be applied to all relevant AQS monitors.

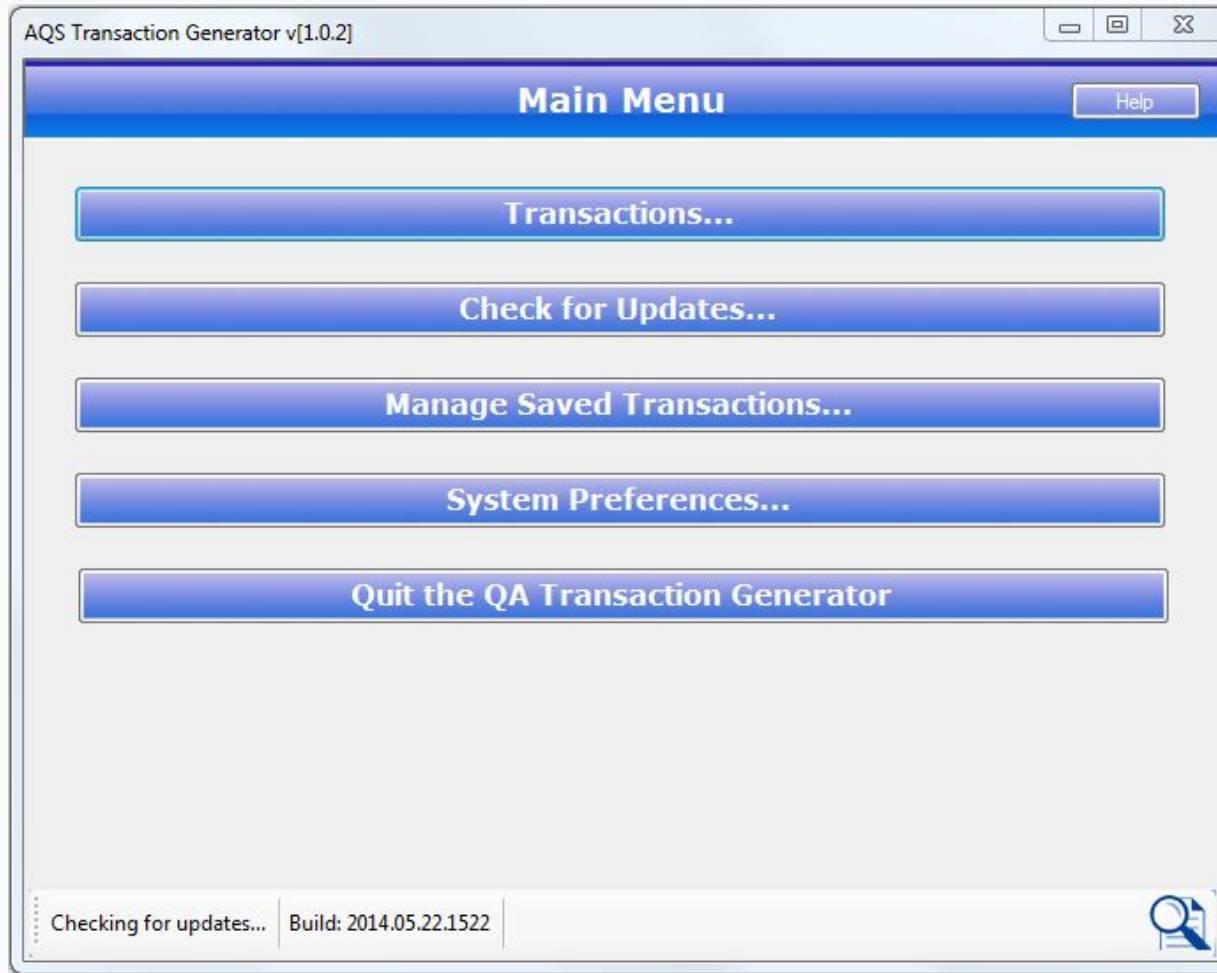
- Site_Sampler: Defines the sampler itself
- Sampler_Channel: Defines a measurement flow path on the sampler.
- Monitor_Channel: Maps the sampler channel to all AQS monitors measured on that channel/filter.
- Speciation Flow Rate Verification
- Speciation Semi-Annual Flow Rate Audit

Input: QA Trans. Generator



- Tool to allow **off-line** creation of all QA transaction types.
- All fields and records validated as soon as they are entered.
- Has built-in capabilities to keep both software and AQS codes up-to-date
- Creates files that are submitted via the normal AQS Batch process.
- Can be downloaded from:
<http://www.epa.gov/ttn/airs/airsaqs/downloads.htm>

Input: QA Trans. Generator (2)



Input: QA Trans. Generator (3)



QA Transactions

Select Transaction Type Help

- 1-Point Quality Control (QC)
- Annual Performance Evaluation (PE)
- Flow Rate Verification
- Semi-Annual Flow Rate Audit
- Flow Rate Verification for PMc
- Semi-Annual Flow Rate Audit for PMc
- Performance Evaluation Program (PEP)
- National Performance Audit Program (NPAP)
- Field Proficiency Test (PT)
- Duplicate
- Replicate
- Pb Analysis Audit
- Lab Proficiency Test (PT)
- Speciation Flow Rate Verification
- Speciation Semi-Annual Flow Rate Audit
- Ambient Air Protocol Gas Verification
- Ozone SRP and Ozone Transfer Standard Verifications

Cancel

1-Point Quality Control (QC) Help

Transaction Type QA

Action Indicator Insert (I)

Assessment Type 1-Point QC

Performing Agency

State Code

County Code

Site Number

Parameter Code

POC

Assessment Date Tuesday, June 17, 2014

Assessment Number + 1

Monitor Method Code

Reported Unit

Monitor Concentration + Assessment Concentration +

OK Cancel

Other Input: Correct Forms



- On-Line Correct Forms
 - One for each QA transaction type
 - Can be used to edit submitted data transactions or create new transactions.
 - AQS codes can be picked from list where appropriate
 - Edited data submitted via standard AQS LOAD process, and fully validated by AQS LOAD.

Correct Form Example



Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q30 Q31 Q32 Q33 Q34 Q35 Q36 Q37 Q38 Q39 Q40 Q41 Q42 Q43 Q44 Q45 Q46 Q47 Q48 Q49 Q50

Action Help Session Admin Retrieval Maintenance Critical Rev Certification Batch Correct Main Menu

GENERIC CORRECT FORM (50 Test User Screening Group)

Select file to view errors: Load QA Data

Submission Date	File Name	User Name	Trans_Count
20140617 15:47	O3_1-Point-QC.txt	TestFirstName TestLastName	326

1-Point QC

Action Ind	State Code/ Tribe Ind	County Code	Tribal Code	Site Number	Parameter Code	Poc	Assessment Date	Assessment Number	Performing Agency	Monitor Method	Reported Unit	Monitor Conc.	Assessment Conc.
U	37	183		0014	44201	1	20130101	1	0776	047	008	70	69
U	37	183		0014	44201	1	20130102	1	0776	047	008	69	69
U	37	183		0014	44201	1	20130103	1	0776	047	008	70	70
U	37	183		0014	44201	1	20130104	1	0776	047	008	70	69
U	37	183		0014	44201	1	20130105	1	0776	047	008	71	70
U	37	183		0014	44201	1	20130106	1	0776	047	008	70	70
U	37	183		0014	44201	1	20130107	1	0776	047	008	71	70
U	37	183		0014	44201	1	20130108	1	0776	047	008	70	70
U	37	183		0014	44201	1	20130109	1	0776	047	008	70	70
U	37	183		0014	44201	1	20130110	1	0776	047	008	70	70
U	37	183		0014	44201	1	20130111	1	0776	047	008	69	70
U	37	183		0014	44201	1	20130112	1	0776	047	008	69	70
U	37	183		0014	44201	1	20130113	1	0776	047	008	69	69
U	37	183		0014	44201	1	20130114	1	0776	047	008	69	70
U	37	183		0014	44201	1	20130115	1	0776	047	008	69	70

ROW ERRORS

Column Name	Error Code	Error Message
	-20656	Security Violation. You do not have permissions to update this data.



- On-Line Maintain Forms
 - One for each QA transaction type
 - Can be used to edit (Insert, Update, or Delete) Production QA data
 - AQS codes can be picked from list where appropriate
 - Record fully validated by SAVE process

Maintain Form Example



Maintain 1-Point QC (Read Only) v1.3

Read-Only

Query Criteria
 Agency Method
 Agency Role Begin Date YYYYMMDD
 End Date YYYYMMDD
 State Monitor Type
 County Monitor Network
 Site ID
 Parameter
 POC

1-Point QC

State Code	County Code	Site ID	Parameter Code	Poc	Assessment Date	Assessment Number	Monitor Method Code	Unit	Assessment Concentration	Monitor Concentration
37	183	0014	44201	1	20130101	1	047	008	69	70
37	183	0014	44201	1	20130102	1	047	008	69	69
37	183	0014	44201	1	20130103	1	047	008	70	70
37	183	0014	44201	1	20130104	1	047	008	69	70
37	183	0014	44201	1	20130105	1	047	008	70	71
37	183	0014	44201	1	20130106	1	047	008	70	70
37	183	0014	44201	1	20130107	1	047	008	70	71
37	183	0014	44201	1	20130108	1	047	008	70	70
37	183	0014	44201	1	20130109	1	047	008	70	70
37	183	0014	44201	1	20130110	1	047	008	70	70
37	183	0014	44201	1	20130111	1	047	008	70	69
37	183	0014	44201	1	20130112	1	047	008	70	69
37	183	0014	44201	1	20130113	1	047	008	69	69
37	183	0014	44201	1	20130114	1	047	008	70	69
37	183	0014	44201	1	20130115	1	047	008	70	69
37	183	0014	44201	1	20130116	1	047	008	70	69
37	183	0014	44201	1	20130117	1	047	008	70	69
37	183	0014	44201	1	20130118	1	047	008	70	70
37	183	0014	44201	1	20130119	1	047	008	70	69



- A Maintain form exists for each of the following types of QA Documents
 - Quality Management Plans
 - Quality Assurance Project Plans
 - Technical System Audits
 - Audits of Data Quality
- These can only be entered on-line and not via batch
- These can only be entered by Regional or Headquarters staff, but can be viewed by anyone

Relationship to Legacy P&A



- All valid legacy Precision and Accuracy data has been converted to the corresponding QA data
- Legacy Precision (RP) and Accuracy (RA) transactions will continue to be accepted through March 2015
- Legacy RP and RA transactions converted to QA data as soon as loaded (Initially over night)
- Caveats:
 - Legacy NATTS Duplicate and Replicate assessments not separated from 1-Point-QC assessments
 - Any Legacy Field-PT assessments not separated from 1-Point-QC assessments

Outputs: QA Reports



- QA Raw Data Report (AMP251):
 - Produced formatted report of submitted transactions with Percent Difference for each value pair
 - Replaces:
 - AMP250: P&A Raw Data Report
 - AMP246: Precision Report
 - AMP247: Accuracy Report
- QA Data Quality Indicator Report (AMP256):
 - Calculates Part 58 Appendix A statistics
 - Replaces: AMP255 (with bug fixes)
- Extract QA Data (AMP504)
 - Allows retrieval of QA transactions as submitted
 - Replaces AMP502 – Extract P&A Data



Access is controlled by Agencies assigned to the monitor rather than by Screening Group

Monitoring Organization (monitor owner)	Full access to routine QA data & Monitor Metadata
PQAO (Pooled QA across monitors)	Full access to routine QA data
Reporting Organization	Full access to routine QA data
Collecting Agency	Is this role needed?
Analyzing Agency	No access to QA data
Audit Agency	Full access to <i>Independent</i> QA data (i.e. PEP & NPAP)
EPA Regional Staff	Read access to regional data for review
EPA HQ Staff	Read access to all data for review



Questions?