

```
XMLSchema" xml version="1.0" encoding="UTF-8"
exchangenetwork" <xsd:schema
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:nei="http://www.epa.gov/exchangenetwork"
targetNamespace="http://www.epa.gov/exchangenetwork"
elementFormDefault="qualified" attributeFormDefault="unqualified"
version="3.0">
<xsd:include schemaLocation="EN_NEI_Common_v3_0.xsd" />
<!--
Start of Schema Header
-->
<xsd:annotation base="http://www.w3.org/2001/XMLSchema"
documentation="Point" />
<xsd:documentation base="http://www.w3.org/2001/XMLSchema"
documentation="Available: http://www.epa.gov/exchangenetwork" />
<xsd:documentation base="http://www.w3.org/2001/XMLSchema"
documentation="input format" />
<xsd:documentation base="http://www.w3.org/2001/XMLSchema"
documentation="user" />
<xsd:documentation base="http://www.w3.org/2001/XMLSchema"
documentation="Agency" />
<xsd:documentation base="http://www.w3.org/2001/XMLSchema"
documentation="qualified" />
<xsd:schemaLocation="EN_NEI_Common_v3_0.xsd" />
</xsd:schema>
</pre>
```

# EPA Air Quality System

## Flow Configuration Document

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Version: 3.0 Draft

Revision Date: March 6, 2012

Prepared by:  
National Air Data Group  
Office of Air Quality Planning and Standards  
U. S. Environmental Protection Agency



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## Change History

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<b>Version</b>	<b>Date</b>	<b>Changed By</b>	<b>Description of Change</b>
1.0	8/24/2005	US EPA	Original.
2.0	4/23.2007	US EPA	Make corrections to FCD version 1.0 and have release notes for schema version 2.0.
2.1	4/23/2007	US EPA	Updated for changes to Schema version 2.1.
2.2	7/16/2010	US EPA	Updated for changes to Schema version 2.2.
3.0	3/02/2012	US EPA	Updated flow for automatic processing of submitted documents

# 1 Component Alignment

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## 1.1 Flow Component Versions Currently Supported

Component	Version(s) Supported	Explanation (optional)
FCD	3.0	When version 3.0 is fully deployed, support for prior versions of the flow will be discontinued.
Schema	2.2, 2.1, 2.0	There is no XML schema change associated with this version.
DET	2.2, 2.1, 2.0	There is no XML schema change associated with this version.

## 2 Introduction

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### 2.1 Flow Identification

**Flow Name:** Air Quality System -- AQS

**Flow Owner:** U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, National Air Data Group

**Flow Owner Contact Information:** Robert Coats, Email: [coats.robert@epa.gov](mailto:coats.robert@epa.gov), Phone: (919) 541-5448

### 2.2 Background

The Air Quality System (AQS) is the official repository for ambient air quality data at the US Environmental Protection Agency (EPA). AQS contains ambient air quality measurements from thousands of monitoring stations around the country that have been collecting data for many decades.

This flow primarily exists for the submission of data to the EPA. Partners include State, Local, and Tribal (SLT) agencies submitting regulatory and voluntary information collected in association with the Clean Air Act. Other submitters include Tribal consortia, other Federal agencies, analytical laboratories, and contractors. This flow of data is critical to the success of EPA's strategic goal for maintaining and improving outdoor air quality.

The primary purpose of AQS is to support EPA's regulatory mission, by hosting the ambient air quality monitoring data that serves as the basis for determining compliance with the Clean Air Act and amendments. Its secondary purpose is to serve as the repository of air quality data for the Air Quality Research community (both within the EPA and Academia) and the health effects research community.

AQS accepts approximately 90 million data measurements per year, facilitates the quality assurance of these values, calculates summaries at various time scales (sub-daily, daily, quarterly, and annual), and serves out about 50,000 reports per year. It is an N-tiered Oracle application with approximately 70 forms and 35 reports with 700 users.

AQS is managed by the Office of Air and Radiation / Office of Air Quality Planning and Standards / Outreach and Information Division / National Air Data Group (OAR/OAQPS/OID/NADG) in Research Triangle Park (RTP), North Carolina. AQS is hosted and operated by the EPA National Computer Center (NCC), also at RTP, North Carolina. AQS is presently in production operation.

### 2.3 Data Flow Overview

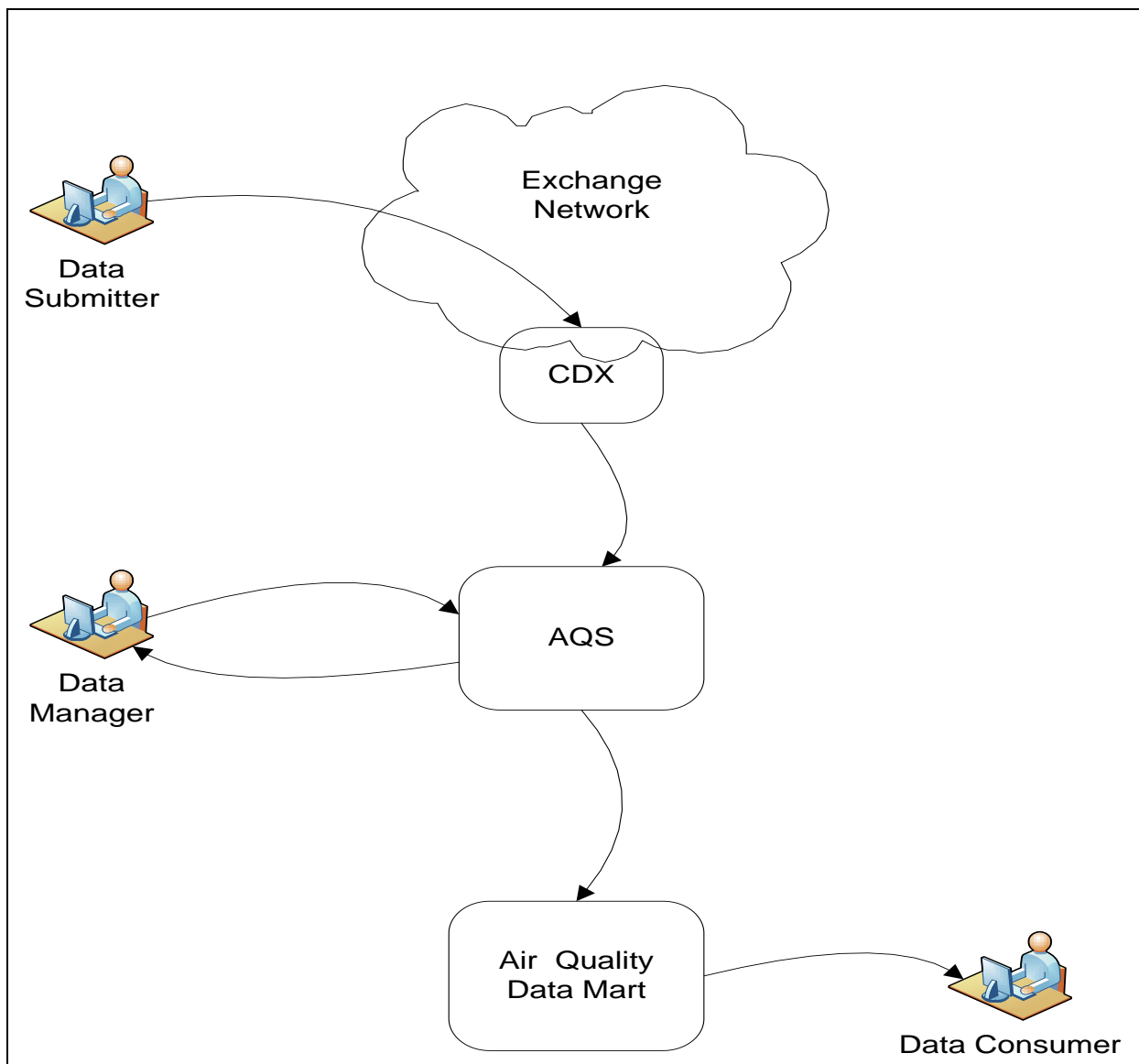
#### 2.3.1 Business Needs

- 1 Support for the submission to AQS of the data required by the United States Code of Federal Regulations (CFR) Title 40 – Protection of the Environment, Parts 50 (National Primary and Secondary Ambient Air Quality Standards) and 58 (Ambient Air Quality Surveillance). This data consists of three distinct high-level types of information. They are as follows:
  - a. Site and Monitor Definitions: This is the information that defines the monitoring locations (Sites), equipment (Monitors), and methods (Sampling Methodologies) utilized for collecting and analyzing ambient air quality measurements.
  - b. Ambient Air Quality Measurements: These are the measurements of ambient air pollution concentrations, and related meteorological conditions, at each of the Sites by specific Monitors at specific Date-Times.

- c. Precision and Bias: Measurements of repeatability and bias of the monitoring process for each submitter.
- 2 Support to the Environmental Council of States (ECOS) and EPA decision to utilize the Exchange Network. Specifically, the following business objectives are addressed by this flow:
  - a. Automate the process for loading data into AQS.
  - b. Support for automated messaging of the transaction status
  - c. Provide an interface for Exchange Network access to ambient air quality measurement data and associated metadata (publishing)

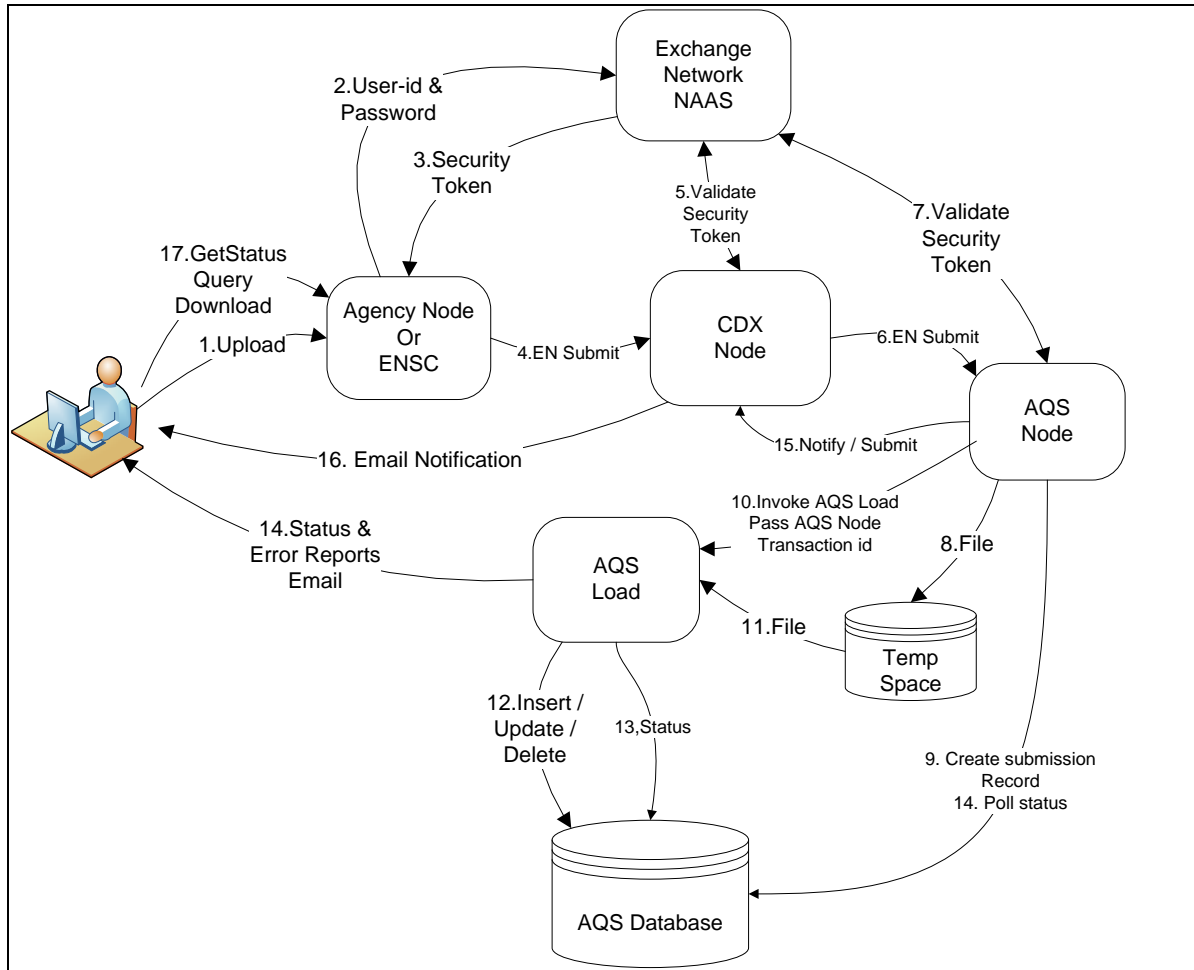
## 2.3.2 Flow Architecture

### 2.3.2.1 Context



Partners submit data to AQS via CDX (the EPA's node on the Exchange Network), and it is automatically processed (if error free) to production status. Data within AQS is managed via the AQS forms and reports application by state, local, tribal, and EPA personnel. Data from AQS is copied nightly to the Air Quality Data Mart, where it is published via a set of Exchange Network compliant web services.

### 2.3.2.2 Submission Architecture



The above diagram shows the major components of the AQS flow and their interfaces and/or interactions. Each interface is numbered with its relative processing order; these are described more fully in the Flow Process section below.

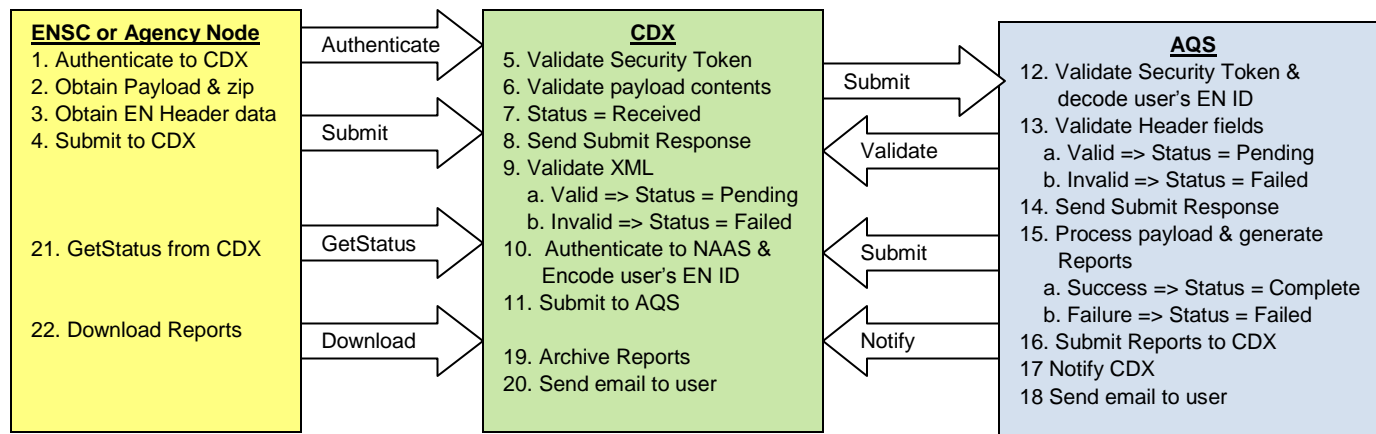
### 2.3.2.3 Publishing Architecture

To be provided at a later date.



## 2.3.3 Flow Process

### 2.3.3.1 Submission



### 2.3.3.2 Publishing

To be provided at a later date.

## 2.4 Flow Access and Security

The AQS flow requires the user to be authorized for both the AQS itself and the Exchange Network; i.e. the user needs both an AQS user-id and password, and an Exchange Network user-id and password.

### 2.4.1 User Registration

Persons needing to submit data to AQS can obtain the necessary User-IDs by completing the User Registration form, and agreeing to the AQS Security Guidelines, both of which are available on the AQS website at <http://www.epa.gov/ttn/airs/airsaqs/registration.htm>.

Once approved, AQS Federal staff will process the creation of an AQS user-id, the creation of an Exchange Network user-id (if the user does not already have one), and the authorization of the EN user-id to submit data via the AQS flow.

### 2.4.2 User Setup

The association between the AQS user-id and the Exchange Network user-id is maintained via the AQS user profile. (The AQS user profile is maintainable via the AQS Forms Application security form.) This form allows the AQS user to specify the EN user-id that is allowed to submit for the AQS user. (In cases where a single EN user-id is used to submit data for all flows from an agency EN Node, the AQS user profile can be configured to allow that EN user-id to submit for the user, rather than the user's personal EN user-id.) The setup process is as follows:

- 1 Log in to AQS with AQS user-id with permissions to process submitted data.
- 2 Access the user profile via the Admin/Security menu pick.
- 3 On the form that comes up, enter in the EN User-ID field, the EN user-id allowed to submit data.
- 4 Click the Save icon (disk image) or the File/Save menu pick.

### 2.4.3 Screening Groups

Within AQS, ownership of data and access control are associated with an entity named "Screening Group". Screening groups correspond roughly to real-world agencies. i.e. Each submitting agency will

have one or more screening groups. For agencies where all staff members may submit any type of data, there is typically one associated AQS screening group. For agencies where different departments may submit different types of data (e.g. gaseous pollutants like Ozone vs particulate pollutants vs Hazardous Air Pollutants (HSPS)) there are typically several screening groups. Screening groups are the AQS entities that own Monitors and their data. A user is allowed to submit data for a monitor only if they are assigned to the screening group that owns the monitor. Users are assigned to screening groups by the AQS Federal support staff.

## 2.5 Flow-level Business Rules

### 2.5.1 Current Business Rules:

- 1 The payload document for a submission shall be zipped.
- 2 The zipped payload shall contain only one file.
- 3 The payload file format shall be either an XML file conformant to a supported AQS Submission schema or a "flat" files in the AQS delimited format (defined in resource # 4).
- 4 The submitting EN user-id and the AQS User-ID specified in the EN Header for the submission (ApplicationUserIdentifier) shall be linked via the AQS User Profile, as described in Section 2.4.
- 5 The Submitting AQS user-id shall be authorized to submit data for the Screening Group specified in the EN Header.
- 6 If specified, the FinalProcessingStep EN Header property shall be in the set {"Stage", "Load", "Post"}.
- 7 If specified, the StopOnError EN Header property shall be in the set ("Yes", "No").

### 2.5.2 Fault Follow-up Actions:

The following fault follow-up actions correspond to failures of the corresponding business rules defined above:

- 1 Zip the payload and resubmit.
- 2 Individually zip each file and submit separately.
- 3 Responses to invalid file format errors:
  - a. XML:
    - i) Download the XML validation report for the transaction ID from CDX
    - ii) Use this to fix the XML error and resubmit
  - b. Non-XML file:
    - i) Convert the data to the AQS delimited format, or a document conforming to the AQS XML schema and resubmit.
- 4 The AQS user needs to log in to the AQS application and specify the correct EN User ID on the AQS Security form.
- 5 The AQS contact for the agency that owns the screening group needs to send an email to [AQSTeam@epa.gov](mailto:AQSTeam@epa.gov) requesting that the user be authorized to submit data for the screening group.
- 6 Specify one of the supported FinalProcessingStep values.
- 7 Specify one of the supported StopOnError values.

## 2.6 Additional Flow Tools and Resources

Documents:

- 1 AQS User's Guide, downloadable from [http://www.epa.gov/ttn/airs/airsaqs/manuals/AQSUserGuide\(2012update\).pdf](http://www.epa.gov/ttn/airs/airsaqs/manuals/AQSUserGuide(2012update).pdf)
- 2 AQS Data Coding Manual, downloadable from <http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS%20Data%20Coding%20Manual.pdf>
- 3 AQS Data Dictionary, downloadable from <http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS%20Data%20Dictionary.pdf>

- 4 AQS Input Transaction Formats (delimited), downloadable from [http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS%20Input%20Transaction%20Formats%20v2\\_17.pdf](http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS%20Input%20Transaction%20Formats%20v2_17.pdf)

## 3 Data Processing

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### 3.1 Node Setup

Submission of data from an Exchange Network flow will require both 1) that the node to be configured to submit to the EPA, and 2) that the node be configured to submit AQS data. The AQS setup is covered in Section 3.1.3 -- Submit below, and primarily consists of creation of an Exchange Network header with the required information. Configuration for submission to the EPA primarily consists of configuration of the node to submit to the EPA Common Data Exchange (CDX) node; all EPA submissions are required to go through the CDX node.

The web service end points for the CDX interface are as follows:

- 1 NAAS Server Endpoints:
  - a. Test Environment: <https://naas.epacdxnode.net/xml/auth.wsdl>
  - b. Production Environment: <https://cdxnodenaas.epa.gov/xml/auth.wsdl>
- 2 CDX Node frontend web services endpoints:
  - a. Node 1.1 Test Endpoint:  
[https://testngn.epacdxnode.net/cdx-enws10/services/NetworkNodePortType\\_V10](https://testngn.epacdxnode.net/cdx-enws10/services/NetworkNodePortType_V10)
  - b. Node 1.1 Production Endpoint:  
[https://cdxnodengn.epa.gov/cdx-enws10/services/NetworkNodePortType\\_V10](https://cdxnodengn.epa.gov/cdx-enws10/services/NetworkNodePortType_V10)
  - c. Node 2.0 Test Endpoint:  
<http://testngn.epacdxnode.net/ngn-enws20/services/NetworkNode2Service>
  - d. Node 2.0 Production Endpoint:  
<https://cdxnodengn.epa.gov/ngn-enws20/services/NetworkNode2Service>

### 3.2 Submission Processing and Feedback

The following is a description of the sequence of operations that occur for a data submission:

- 1 User performs login to Node (agency node or EPA CDX ENSC) using Exchange Network user-id and password.
  - a. Node performs EN Authenticate operation against NAAS by sending the user-id and password.
  - b. NAAS authenticates user-id and password.
  - c. NAAS generates EN Security Token and returns to Reporting Agency Node.
- 2 User interacts with node to select data submission and provides the following information:
  - a. Payload document (Note: May be derived from agency data system rather than provided by the user as a file.)
    - i) Document Name: Note: This name will be passed through to AQS to allow the user to identify the submitted data.
    - ii) Document Contents
  - b. AQS User ID
  - c. AQS Screening Group
  - d. AQS Load Options (Note: If these are omitted the receiving AQS node will provide default values)
    - i) Final Processing Step {"Stage", "Load", "Post"} (Default of 'Post')
    - ii) Stop On Error {"Yes", "No"} (Default of 'Yes')

- 3 Node creates EN Header, zips the combined Header and Payload file, and performs EN SUBMIT operation. Final document (including the Submit SOAP message and the EN Header) contains at least the following information:
  - a. EN Security Token (SOAP Submit message; encodes user's EN User-id)
  - b. Document Name: User's name for the file. (SOAP Submit message)
  - c. Document Type: "ZIP" (SOAP Submit message)
  - d. AQS User-ID (EN Header Field: ApplicationUserIdentifier)
  - e. AQS Screening Group Name (EN Header Property: Screening Group)
  - f. AQS Load Options (EN Header properties)
    - i) Property: Final Processing Step
    - ii) Property: Stop On Error
  - g. Payload document.
  - h. Payload Type: The format of the file submitted (EN Header Property: "XML", "FLAT" for non-XML file)
- 4 Node waits for Transaction ID to be returned by CDX Node.
- 5 EPA CDX Node receives EN Submit
  - a. CDX interfaces to the NAAS to verify that the security token is valid for the user, and extracts the user's EN user-id. (SOAP fault generated if security token is not valid or if document is not zip file containing single XML Header.)
  - b. CDX sets the transaction status to 'RECEIVED' and returns a "CDX Transaction ID" to the submitting node. (At this point all synchronous portions of the submission are completed. All remaining steps are performed asynchronously.)
  - c. CDX performs CDX specific data management functions, such as XML validation and archiving submitted data. If these operations fail, the transaction status is set to 'FAILED' and sends the originating node a notification message.
  - d. The CDX Node authenticates to the NAAS, and forwards all submitted information to AQS Node, via an EN SUBMIT operation, and sets the transaction status to 'PENDING'. (Note: The original EN user-id is encoded in the new Security Token so that it can be extracted by the AQS Node, to determine the ID of the original submitter.)
- 6 AQS Node receives EN Submit
  - a. The AQS Node interfaces to the NAAS to verify that the security token is valid and extracts the original submitter's EN user-id. (SOAP fault generated if not valid.)
  - b. The AQS Node validates that the EN User-ID is authorized to submit data for the AQS user-id and Screening Group provided in the EN header. (Internal AQS lookup)
  - c. The AQS Node saves the payload document to temporary storage on the server with a unique name and saves the submission metadata (from step #3 above) into the AQS database.
  - d. If any of the above operations fail, the AQS Node sets the transaction status to 'FAILED' and sends a SUBMIT RESPONSE message to CDX with the failure reason, and processing stops.
  - e. If all of the above operations are successful, the AQS Node sets the transaction status to 'STARTED' and sends a SUBMIT RESPONSE message to CDX.
- 7 The AQS Node executes the AQSLOAD process.
- 8 AQSLOAD performs the following:
  - a. Uses Oracle Proxy Authentication to connect to Oracle as the AQS Submitting User
  - b. Loads the contents of the payload document into the AQS database Staging Tables.

- c. Depending on the “Final Processing Step” option, the AQS LOAD processes is executed to copy the submitted data from the Staging tables to the production database tables.
  - d. Generates the AQS Load Report.
  - e. The Stat/CR process is executed, to execute the AQS statistical validation tests, then the AQS “Stat/CR Report” is generated to format these results for user review.
  - f. Depending on the options provided and any errors encountered, the AQS process POST is executed. Note: For making this decision, any “warnings” from AQSLOAD or statistical anomalies detected by the Stat/CR process will stop the process if “Stop On Error” is requested.
  - g. If POST is executed, then the AQS “Raw Data Inventory” report is generated.
  - h. URLs of the generated reports are determined from their position in the directory hierarchy.
  - i. The AQS user’s email address is determined from the AQS database, and an email is generated that contains both the processing log and the URLs of the generated reports.
  - a. When data is successfully loaded to the database (including the Staging Tables), the submission (job) status will always be set to “COMPLETE”, even if individual transactions in the submitted file remained pre-production because of errors, and the error details will be available via the processing reports (e.g. “Load Report”), and the number of AQS transactions processed successfully and in error are stored in the AQS database in association with the Transaction ID.
  - j. When no data is processed because of errors, the submission status will be set to “FAILED” and the failure reason is associated with the Transaction ID.
- 9 The AQS Node creates a zip archive with the processing job log and any generated reports, and performs an EN SUBMIT operation to CDX for the Transaction ID.
  - 10 The CDX Node receives the SUBMIT message and saves the status information for the Transaction ID.
  - 11 The AQS Node generates a NOTIFY message to CDX for the Transaction ID with the Status and processing detail information.
  - 12 The CDX Node receives the NOTIFY message and saves the status information for the Transaction ID.
  - 13 If the EN Header field, SenderAddress, is not null, then the CDX Node will send an email to this address with the transaction status and processing details.

### 3.2.1 Authenticate

Note: This interface is between the node utilized by the end-user and the EPA CDX Node.

#### **Data Service-level Business Rules:**

- 1 User must be registered EN user.

**XML Header Usage:** Not applicable

#### 3.2.1.1 Request

##### **Input Parameters:**

- 1 userid: NAAS user Id
- 2 credential: NAAS user Password
- 3 domain: “default” (Node 2.0 protocol only)
- 4 authenticationMethod: “password”

### 3.2.1.2 Response

#### Return Parameters:

- 1 EN Security Token

#### Error Conditions and Return:

- 1 E\_UnknownUser
- 2 E\_InvalidCredential
- 3 E\_InvalidParameter

### 3.2.2 Submit

Note: This interface is between the node utilized by the end-user and the EPA CDX Node.

#### Data Service-level Business Rules:

- 1 The payload document for a submission shall be zipped.
- 2 The zipped payload shall contain only one file.
- 3 The payload file format shall be either an XML file conformant to a supported AQS Submission schema or a "flat" files in the AQS delimited format (defined in resource # 4).
- 4 The submitting EN user-id shall be authorized in the NAAS to submit for the AQS flow.
- 5 The submitting EN user-id and the AQS User-ID specified in the EN Header for the submission (ApplicationUserIdentifier) shall be linked via the AQS User Profile, as described in Section 2.4.
- 6 The Submitting AQS user-id shall be authorized to submit data for the Screening Group specified in the EN Header.
- 7 If specified, the FinalProcessingStep EN Header property shall be in the set {"Stage", "Load", "Post"}.
- 8 If specified, the StopOnError EN Header property shall be in the set ("Yes", "No").

#### Exchange Network Header Usage:

AQS utilizes the Exchange Network Document Header Specification, version 2.0.

Element Name	Required	AQS Use
<b>AuthorName:</b> Originator of the document. This should be the name of a person or a network node ID if the document is automatically generated.	Yes	Not Used by AQS.
<b>OrganizationName:</b> The organization to which the author belongs. It may be a state name, an organization name or a company name. For submissions to the CDX node, this should be the name of the organization.	Yes	Not Used by AQS.
<b>DocumentTitle:</b> Title of the document.	Yes	Not Used by AQS.
<b>CreationDateTime:</b> This is a timestamp that marks when the document, including payloads and header part, was created.	Yes	Not Used by AQS.
<b>Keywords:</b> Words that best describe the payload. Multiple keywords should be separated by commas. This is for transaction categorization and searching.	No	Not Used by AQS.
<b>Comment:</b> Additional comments for processors.	No	Not Used by AQS.
<b>DataFlowName:</b> The name of the data flow associated with the payload. It could be the name of the data source for Query results.	Yes	AQS

<b>DataServiceName:</b> Name of a data service that generated the document. This is the name of the procedure that was used to initiate the creation of the payload. This would apply only for Query and Solicit and would not be applicable for Download and Submit.	No	N/A
<b>SenderContact:</b> The sender's additional contact information. It could contain sender's electronic address and/or telephone numbers where the author can be reached.	No	Not Used by AQS.
<b>ApplicationUserIdentifier:</b> The user ID for the backend system if it is different from the NAAS user ID.	Yes	AQS User-ID
<b>SenderAddress:</b> A well-formed URI where result/report can be sent. Currently the Network will make use of the Notification mechanism at the Document Level as described in the Protocol and Specification. Note that this could contain multiple addresses, including that of the submitter and/or other technical people related to contents of the payload.	No	Not Used by AQS..
<b>Property Begin Tag:</b> Other properties of the document (use name value pairs). This is an extension mechanism to cover any other elements that are not defined in the specification.	Yes	<hdr:Property>
<b>Property: AQS.ScreeningGroup</b>	Yes	<hdr:PropertyName> AQS.ScreeningGroup </hdr:PropertyName> <hdr:PropertyValue> The AQS screening group name that owns the monitors related to the submission. </hdr:PropertyValue>
<b>Property: AQS.FinalProcessingStep</b> Last step of the AQS Load process that will be performed on the user's data.	No	<hdr:PropertyName> AQS.FinalProcessingStep </hdr:PropertyName> <hdr:PropertyValue> Member of the set: {"Stage"," Load", "Post"}. </hdr:PropertyValue>
<b>Property: AQS.StopOnError</b> Option to tell AQS whether or not to stop processing of valid input transactions if any one of the transactions submitted contains an error.	No	<hdr:PropertyName> AQS.StopOnError </hdr:PropertyName> <hdr:PropertyValue> Member of the set: {"Yes", "No"}. </hdr:PropertyValue>
<b>Property: AQS. PayloadType</b>	Yes	<hdr:PropertyName> AQS.PayloadType



		<pre> &lt;/hdr:PropertyName&gt; &lt;hdr:PropertyValue&gt; Member of the set: {"XML", "FLAT"}. &lt;/hdr:PropertyValue&gt; </pre>
<b>Property: AQS.SchemaVersion</b>	No	<pre> &lt;hdr:PropertyName&gt; AQS.ShemaVersion &lt;/hdr:PropertyName&gt; &lt;hdr:PropertyValue&gt; The schema version &lt;/hdr:PropertyValue&gt; </pre>
<b>Property End Tag</b>	Yes	</hdr:Property>
<b>Signature:</b> An XML signature associated with the document (Use <a href="http://www.w3.org/2000/09/xmldsig#">http://www.w3.org/2000/09/xmldsig#</a> )	No	Not Used by AQS.
<b>id:</b> A unique identifier for the document. This is an attribute of ExchangeNetworkDocument and provides a unique Id for each document in the payload.	Yes	Not used by AQS.

### 3.2.2.1 Request

#### Input Parameters:

- 1 Security token: NAAS security token (encoding user's EN user-id)
- 2 Transaction id: not used
- 3 Dataflow: "AQS"
- 4 flowOperation: not used
- 5 recipient: not used
- 6 documents: One document containing zipped AQS document with following attributes:
  - a. Document Name provided by user
  - b. Document Type = "ZIP"
  - c. Document Content: Single AQS file (XML or flat file)

### 3.2.2.2 Response

#### Return Parameters:

- 1 TransactionId: CDX Transaction ID.
- 2 status: "RECIEVED"
- 3 statusDetails: empty

#### Error Conditions and Return:

- 1 E\_InvalidToken
- 2 E\_TokenExpired
- 3 E\_AccessDenied

### 3.2.3 GetStatus

Note: This interface is between the node utilized between the end-user and the EPA CDX Node.

#### Data Service-level Business Rules:

- 1 Transaction Id shall be valid CDX Transaction ID for a previously submitted file.

**XML Header Usage:** Not applicable.

### 3.2.3.1 Request

**Input Parameters:**

- 1 Security Token: security token
- 2 CDX Transaction id

### 3.2.3.2 Response

**Return Parameters:**

- 1 If the submission was performed on Node 1.1 protocol, the CDX Node returns a transaction status to the Reporting Agency Node. Following transaction statuses can be returned:
  - a. PENDING: the document was received and archived by CDX Node, document processing was scheduled
  - b. PROCESSING: the document was validated and distributed to AQS Node
  - c. COMPLETE: processing of the document was completed, the Report documents are available for download (Note: This only means that AQS was able to process all of the records in the user's submission, not that they were processed without error. i.e. Any errors that occurred must be corrected internal to AQS (by the AQS forms interface), rather than by resubmitting a corrected file.)
  - d. FAILED: processing of the document failed, (i.e. No data was successfully loaded from the file.) Error Report is available for Download
- 2 If submission was performed on Node 2.0 protocol CDX Node returns a Submit response containing following information:
  - a. TransactionId: CDX Transaction ID.
  - b. status:
    - i) PENDING: the document was received and archived by CDX Node, document processing was scheduled
    - ii) PROCESSING: the document was validated and distributed to AQS Node
    - iii) COMPLETE: processing of the document was completed, the Report documents are available for download. (Note: This only means that AQS was able to process all of the records in the user's submission, not that they were processed without error. i.e. Any errors that occurred must be corrected internal to AQS (by the AQS forms interface), rather than by resubmitting a corrected file.)
    - iv) FAILED: processing of the document failed, (i.e. No data was successfully loaded from the file.) Error Report is available for Download
  - c. statusDetails: Text message containing the number of AQS transactions (e.g. sample measurements) processed successfully and failing each AQS processing step (Stage, Load, Stat/CR, and Post) that was executed.

**Error Conditions and Return:**

- 1 E\_InvalidToken
- 2 E\_TokenExpired
- 3 E\_AccessDenied

### 3.2.4 Download

Note: This interface is between the end-user node utilized and the EPA CDX Node.

**Data Service-level Business Rules:**

- 1 Transaction Id shall be valid CDX Transaction ID for a previously submitted file.

**XML Header Usage:** Not applicable.

#### 3.2.4.1 Request

**Input Parameters:**

- 1 securityToken: NAAS security token
- 2 dataflow: "AQS"
- 3 transactionId: CDX transaction ID
- 4 documents: Empty array of NodeDocumentType

### 3.2.4.2 Response

#### Return Parameters:

- 1 Array of Node Document Types, with two elements:
  - a. Submitted File (zipped)
  - b. XML Validation Report (for XML submissions only, not zipped)
  - c. Zipped archive of processing results. The following files are optional members of the archive (depending on the processing options selected with the submit operation)
    - i) Processing Report: Narrative text file that indicates which job steps were executed and for each provides the number of AQS transactions successfully processed and the number of transactions with errors.
    - ii) Load Report: PDF File containing a count of transactions by AQS transaction type, and a list of the transactions with errors. (Only present if FinalProcessingStep is Load or Post.)
    - iii) Stat/CR Report: PDF files containing any statistical or critical review warnings. (Only present if FinalProcessingStep is Load or Post.)
    - iv) Raw Data Inventory Report: PDF file containing counts of Inserts, Updates, and Deletes by Monitor-Month. (Only present if FinalProcessingStep is Post., the input file contained sample measurement data, and either no errors were encountered or StopOnError was set to "No")

#### Error Conditions and Return:

- 1 E\_InvalidToken
- 2 E\_TokenExpired
- 3 E\_AccessDenied

## **4 Data Publishing**

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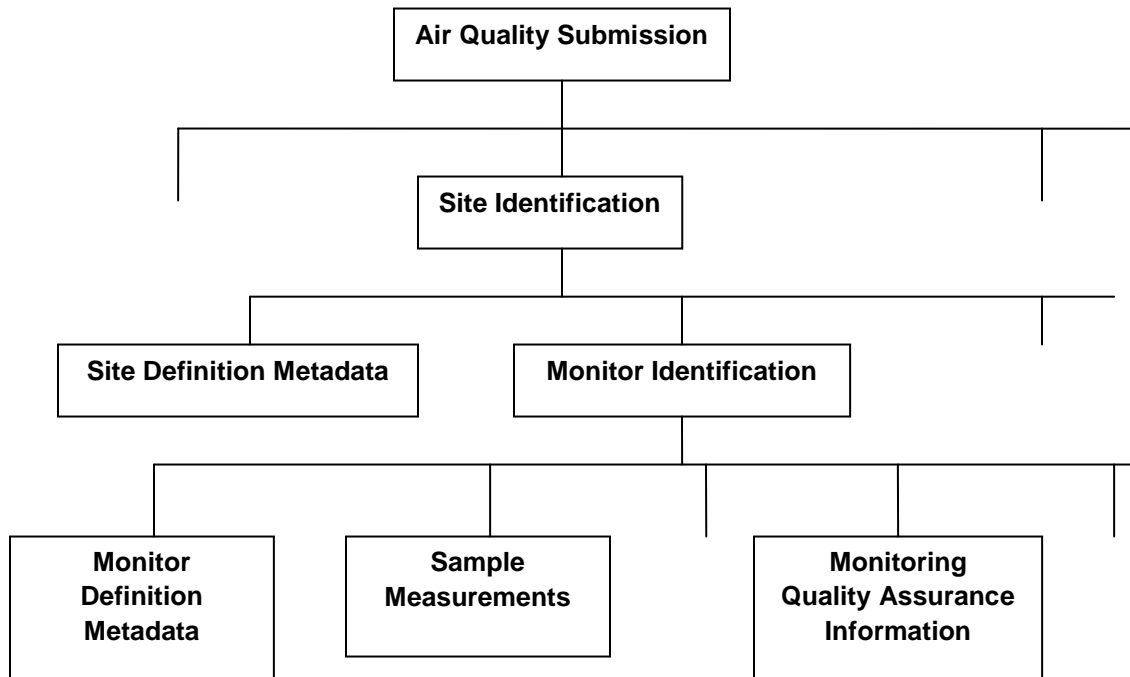
To be provided at a later date.

## 5 Schema Information

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### 5.1 Schema Structure

The following is intended for an overview of the AQS XML submission schema. (Specific details are contained in the schema definition itself.)



### 5.2 Schema Components

- 1 The top level of the AQS XML schema is an Air Quality Submission document.
- 2 Each document will contain the identification of one or more sites.
- 3 Each Site identified may have either site definition metadata or a set of monitor identifications.
- 4 Each monitor identified may have either monitor definition metadata or a set of sample measurements or a set of monitoring quality assurance information.
- 5 Sample measurements are a time-series of measurements of either ambient pollutant concentrations or related meteorological quantities.
- 6 Monitoring quality assurance information consists of a set of audits of the monitoring process designed to determine its measurement precision and accuracy.

## Appendix A – Implementation Checklist

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- 1 Conduct Ambient Air Quality Surveillance (monitoring) as per 40 CFR Part 58 (available at <http://ecfr.gpoaccess.gov/>).
- 2 Format the required monitoring-location metadata as AQS site definitions in either an XML or delimited flat file.
- 3 Format the required monitoring-method metadata as AQS monitor definitions in either an XML or flat delimited file.
- 4 Format the sample measurements as AQS Raw Data transactions in either an XML or flat delimited file.
- 5 Format the Part 58 required monitoring quality assurance information as AQS Precision and Accuracy transactions in either an XML or flat delimited file
- 6 Register for an AQS user-id associated with the agency (state, local, or tribal) that is responsible for ambient air quality monitoring.
  - a. This will result in either the creation of a new Exchange Network user-id or associating this AQS user-id with an existing Exchange Network user-id.
  - b. This will also result in the user being assigned to a Screening Group belonging to the agency,
- 7 Log in to the AQS system, access the User Profile (Admin/Security form) and link the AQS user-id with the Exchange Network user-id that will be authorized to submit for the AQS user.
- 8 Submit the AQS Site and Monitor definitions to either the user's agency Exchange Network node or the Exchange Network Service Center. This will require at a minimum the following submission processing metadata:
  - a. Exchange Network user-id: Note this may be either specific to the user or common to the submitting agency.
  - b. AQS user-id: As specified above, this must be linked to the submitting EN user-id via the AQS user profile.
  - c. AQS Screening Group.
  - d. Submission file type: Either XML or Flat
- 9 Verify processing results utilizing either the email notice sent to the AQS user or the EN Download operation.
- 10 Submit the AQS sample measurement data for previously loaded site and monitor definitions, using either the user's agency Exchange Network node or the Exchange Network Service Center. This will require at a minimum the following submission processing metadata:
  - a. Exchange Network user-id:
  - b. AQS user-id:
  - c. AQS Screening Group.
  - d. Submission file type: Either XML or Flat
  - e. Final Processing Step Option: One of the set {Stage, Load, Post} based on the submitting agency's data handling policies and procedures.
  - f. Stop On Error Option: One of the set {Yes, No} based on the submitting agency's data handling policies and procedures.
- 11 Verify processing results utilizing either the email notice sent to the AQS user or the EN Download operation.
- 12 Submit the Part 58 required monitoring quality assurance information, using either the user's agency Exchange Network node or the Exchange Network Service Center. This will require at a minimum the following submission processing metadata:
  - a. Exchange Network user-id:
  - b. AQS user-id:
  - c. AQS Screening Group.
  - d. Submission file type: Either XML or Flat

- 13 Verify processing results utilizing either the email notice sent to the AQS user or the EN Download operation.