

Water Quality Exchange Pilot Handbook

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Introduction

Background

The U.S. Environmental Protection Agency's (EPA's) Office of Information Collection (OIC) and Office of Wetlands, Oceans and Watersheds (OWOW) is committed to implementing Central Data Exchange (CDX) services and establishing the EPA infrastructure to support an ambient water quality monitoring data exchange. The Water Quality Monitoring data exchange project is the product of a collaborative effort between OIC, OW, and the Environmental Council of States (ECOS). The project was identified during the development of the Environmental Sampling Analysis and Results (ESAR) data standard for water monitoring.

The project goal is to provide EPA state partners with a means of exchanging water quality monitoring data via CDX, using the Office of Water, Water Quality Exchange (OWWQX) data standard (a hybrid of the ESAR data standard). OW, in partnership with the states, will establish water quality monitoring data exchange elements, business rules for exchanging these elements, and valid domain lists for elements not covered by an existing or proposed standard.

The Office of Water, Water Quality Exchange (OWWQX) Pilot established a data flow through which three initial pilot states (Oregon, Michigan, and Texas), as well as the Wind River Environmental Quality Commission (WREQC), could submit Water Quality Monitoring (WQM) data to EPA via the CDX Exchange Network node.¹

The OWWQX pilot included the workflow for both CDX Node and CDX Web submissions. Only four nodes were involved in this initial pilot, namely: Michigan, Oregon, Texas, and WREQC. The pilot was implemented in the CDX Pre-Production environment.

Exhibit 1 depicts the high level overview of the OWWQX Pilot system. The OWWQX Pilot system consists of the following elements:

- Nodes - Michigan, Oregon, Texas, and WREQC
- CDX
- OWWQX Back-end Application
- OWWQX Database

¹ Note: WREQC is a joint commission of the Arapaho and Shoshone tribes.

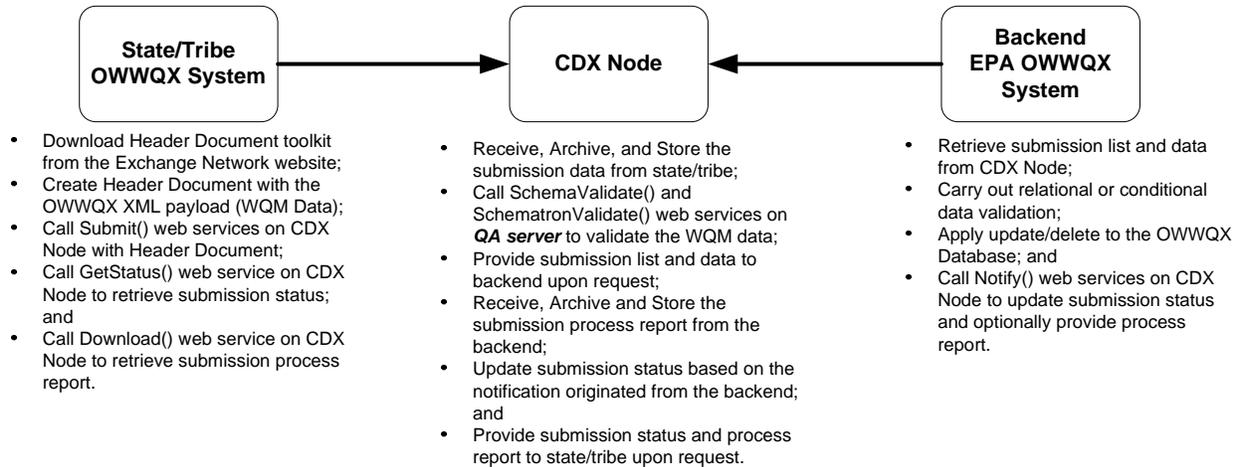


Exhibit 1 – OWWQX Pilot System Overview

The OWWQX pilot included submitting the following types of data:

- the physical conditions in the environment at the time of a site visit;
- the chemical and bacteriological make-up of the water sampled;
- and optionally, chemical analyses of the tissues of any fish collected.

The pilot data flow utilized two mechanisms for exchanging water quality monitoring information; a Web-based solution for manual submissions and a Web services-based solution for automated submission utilizing Exchange Network standards. Upon EPA approval of the pilot data flow, the data flow will be deployed to CDX Production.

Document Purpose

This handbook is intended to define the supported data services, the approaches and processes that were used to exchange information over the Exchange Network via Web services technology. In addition, the handbook serves as a guide for trading partners to the details and challenges associated with the pilot flow.

The purpose of this handbook is to describe the operation of the Water Quality Monitoring (OWWQX) Network Exchange using XML-based data submissions through Node-to-Node or Client-to-Node transfers. The focus of the document is the core OWWQX data CDX Node flow between the state, local, and tribal agencies and EPA that meet the OWWQX pilot requirements. The scope of this handbook has been limited to the following primary functions:

- Submission of the data; and
- Reporting of the submission status.

This document does not include any query or data retrieval methods, commonly referred to as data services. It is the objective of the OW to develop this pilot into a viable means to supply data to the central EPA data warehouse. OW is separately committed to providing outbound services from that warehouse, which will combine OWWQX data with data from other sources (e.g. Local STORET).

How to use this Handbook

This handbook provides guidance to implementing an XML/data service based model for the data submission. For the pilot project, there were two types of submissions, update/insert and delete. This

handbook expands upon the usage of the OWWQX Schema, introduces the implementation of the Document Header, and provides data examples for data submissions.

This document includes the following main sections:

Implementing the Header Document

This section describes how the OWWQX Network Exchange makes use of the Exchange Network Header Document to describe the payload content of a Network message. This submission structure was used for both Node-to-Node/Client-to-Node submission as well as the web submission, to be implemented in a later phase.

Configuring the Network Exchange

This section describes how the OWWQX Network Exchange was configured for each of the two submission types. It also provides the details on the payload operations.

Submission Processing and Feedback

This section describes the processing steps and the feedback mechanism on the submission status.

OWWQX Data Submission Process Tutorial

This section describes the detailed processing steps for submitting OWWQX data files using the CDX Integration Test Tool.

Implementing the Header Document

Overview

The Exchange Network Header provides additional information about the contents of a message payload. It was developed to further automate the data exchange process so that data can be more readily identified during transport and managed at its processing destination. The Header Document can describe what a data payload contains, who submitted it, when it was submitted, as well as instructions on processing the payload contents, such as whether the contents are inserts and updates or deletions. The Header is independent of payload contents.

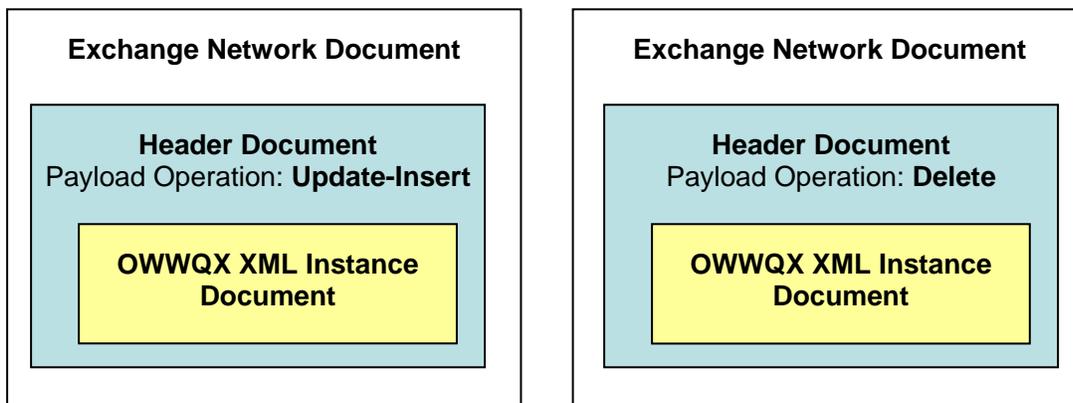
Essentially, the Header Document is an XML wrapper which is placed around one or more XML payloads before transmission to CDX. A Header Document toolkit is available in the Tool Box section of the Exchange Network Web site (<http://www.exchangenetwork.net>), containing additional background about the Header Document, as well as Java and .Net implementation tools.

Header/Payload Relationship

Any network exchanges for OWWQX must use the Header Document structure. This approach must be used in order to meet EPA CDX and OWWQX processing requirements and prior Exchange Network agreements.

The Exchange Network Document will include the Header Document and the Payload in a single XML document for the submission. For the purposes of this exchange, the Exchange Network Header must contain only a single payload. The Payload must conform to one of the OWWQX standard schemas for data submissions. When preparing the XML document, the agency should follow OWWQX standards to ensure that all data completeness and relationship rules are met.

The following diagrams describe the basic Exchange Network Document Structure and the relationship of the header to payload.



The following table describes the Header Document elements and how they are utilized for the purpose of the OWWQX submissions.

Header Element	Description	Example Value	Req'd	Notes
Author	First and Last Name of Individual generating the XML document	Joe Smith	Yes	Reference only
Organization	Name of company or environmental agency or individual generating the XML document	State X Department of Environmental Quality	Yes	Reference only
Title	Type of Submission	Set to "OWWQX"	Yes	Reference to the flow.
CreationTime	Date/Time when the document was generated	2003-01-01T12:12:12 (where date is a valid XML date format string)	Yes	Used to validate submission requirements.
Comment	Free text description of the message contents.		No	Reference
Data Service	Name of the backend application	N/A	No	Unused
ContactInfo	Name, mailing address, city, state, zip, telephone number, and email address of person who may be contacted with questions concerning the submission.	Joe Smith 123 Main St. Portland, OR 97226 503 123 4567 Joe@deq.statex.gov	Yes	Reference
Notification	URI where return document is sent in instances of invoking solicit services. Multiple values allowed.	N/A	No	unused
Sensitivity	Level of Document Sensitivity	N/A	No	unused
Property	Name Value pairings used to describe specific properties of the document.			unused
Payload Operation Attribute	This is specified by payload and describes the	[Update-Insert] or [Delete]	Yes	This describes both the data source type and the operation to

Header Element	Description	Example Value	Req'd	Notes
	operation to be performed on the payload. Multiple values are not allowed			be performed. The operation component replicates the function of the Transmittal Group Transaction Type element.
Schema Reference	OWWQX approved schema for submission	OWWQX_OWVWQX_v1.0.xsd or OWWQX_OWVWQX_Delete_v1.0.xsd	Yes	

Submission Structure

In addition to the Exchange Network Document (containing the Header and Payload described above), a submission can also include binary objects (such as images or documents). These binary objects was referenced (by unique name) in the OWWQX schema, and provided as individual, external documents. In order to group all related documents for a submission, each OWWQX submission was provided to CDX in a single compressed file in ZIP format. This also improved transmission efficiency due to the smaller size of compressed files. Even if a submission did not contain any external binary objects, it was still provided in ZIP format. Additionally, the Exchange Network Document within the submission was the only file to have an ".xml" extension. This allowed CDX to differentiate between it and any other binary object files included in the submission.

Processing

The Payload Operation Attribute provided in the Header Document is used to denote the type of processing for a submission. There are two acceptable values: "Update-Insert" or "Delete". Use of these operators triggered the modular processing approach outlined in the *Configuration of the Network Exchange* section of this document. For example, a payload operation of "Update-Insert" informed the back-end application that the payload contained new or existing data. Existing records, identified by a matching unique identifier, was replaced with the updated data in the payload for that matching identifier.

Configuring the Network Exchanges

One primary flow was identified for the Network Exchange, and is detailed in the following configuration table. Following these configuration details is a detailed description of the payload operations supported by the Network Exchange.

FCD Specification Area	Value	Notes
Flow Name	OWWQX	
Network Method/parameters	<p>Submit with the following parameters:</p> <p>§ securityToken: A security token issued by the service provider or a trusted service provider.</p> <p>§ transactionId: unused for State/Tribe submission.</p> <p>§ dataflow: The name of target dataflow : “OWWQX”</p> <p>§ documents: An array of nodeDocument. Each nodeDocument structure describes a single attachment or payload. For this flow, only a single instance of nodeDocument will be submitted.</p> <p>GetStatus with the following parameters:</p> <p>§ securityToken: A security token issued by the NAAS</p> <p>§ transactionId: A transaction ID obtained from the submission call.</p>	
Payload Schema	OWWQX_OWWQX_v1.0.xsd or OWWQX_OWWQX_Delete_v1.0.xsd	
Payload Operation	Update-Insert or Delete	
Payload Formatting/ Structure		nodeDocument must contain file in ZIP format as described in the <i>Submission Structure</i> section of this document
GetStatus Responses	Created, Pending, Completed, or Failed	
Timing	As established in Trading Partner Agreements/ Expected to be a minimum of once per month.	
NAAS Authorized User Accts	NAAS must have a policy to authorize Submit and getStatus for the OWWQX exchange	

Payload Operations

Two types of operations could be performed. These were the Update-Insert Operation and the Delete Operation. Exhibit 2 provides the high level overview on the relationships between the elements.

The following sections provide the details for each operation.

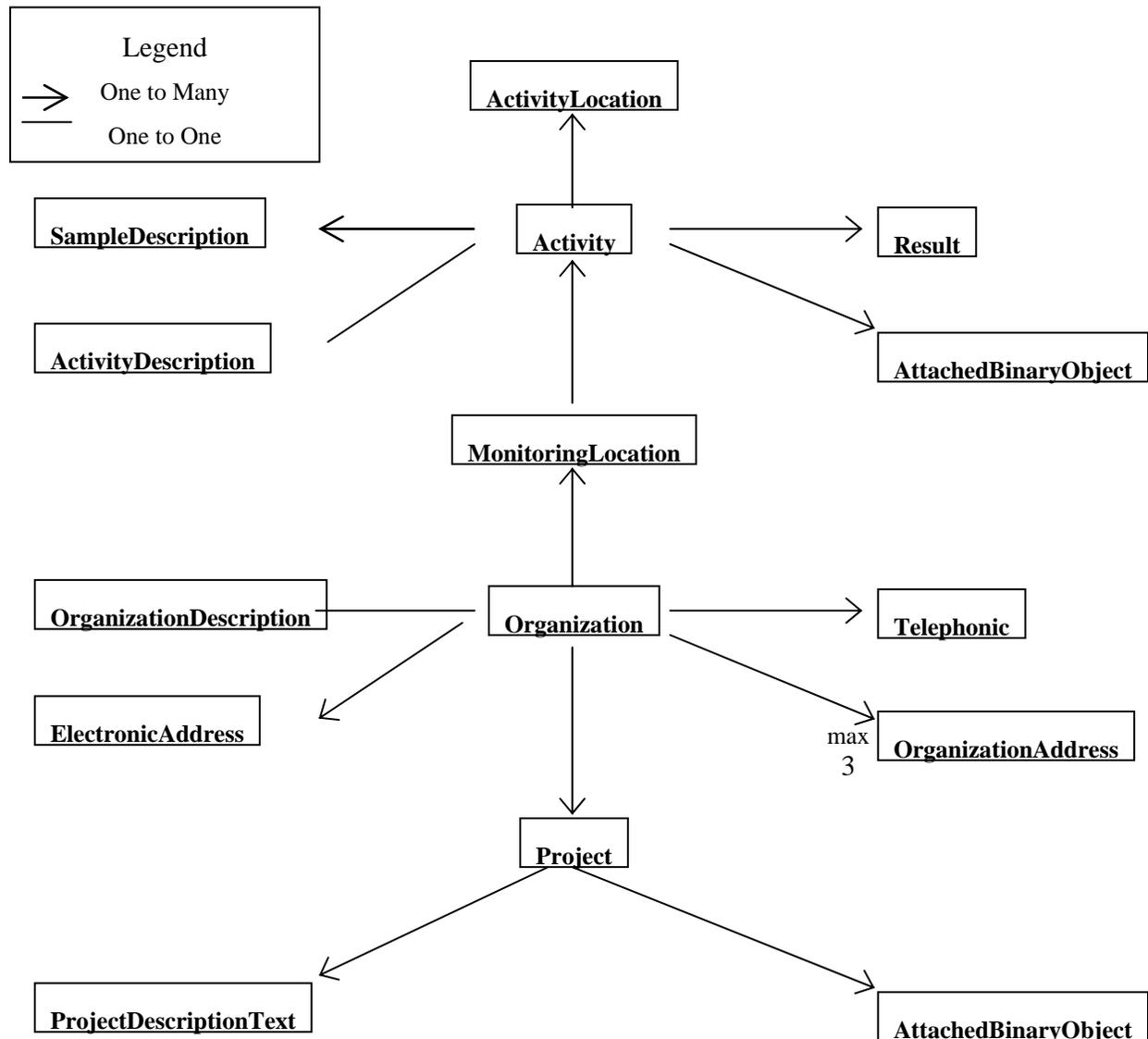


Exhibit 2 – High Level Relationship Overview

Payload Operation: Update-Insert

For the *Update-Insert* operation, the OWWQX Back-end Application compared the unique ID for each Project, Monitoring Location, and Activity in the Payload with existing data in the OWWQX database. If the data already existed, it was replaced by the copy from the Payload. If it did not exist, it was inserted into the database as new data.

As the Activity element is the lowest element in the OWWQX Schema hierarchy to contain a unique ID, it was the lowest level of Update that could occur. In other words, elements in the schema that fall below an Activity (i.e. Field Sub-sample, Results, etc.) could not be updated individually. The Activity unique ID, global identifier, is unique within the organization. If an Activity in the Payload matches an existing Activity in the OWWQX Database, the Activity and all of its related Field Sub-samples, Results, etc. was deleted from the database before inserting the new Activity, Field Sub-samples, and Results from the Payload. All other elements in the schema containing a unique ID that are above the Activity (e.g. Project, Monitoring Location, etc.) could be updated without requiring a full replace of all child records.

Although Organization is a required element in the Update Schema, ancillary organization data (e.g. OrganizationAddress, ElectronicAddress, and Telephonic), were not required. The rules for updating this information were as follows:

1. If an element is included in the payload, it replaced all elements of the same type in the database. For example: if one or more OrganizationAddress elements were included in the payload, all Organization Addresses in the OWWQX Database were deleted before creating the new Organization Address(es).
 - a. Additionally, if the OrganizationAddress tags were in the payload but contained no data, then only the Delete step was performed (leaving no Address for the Organization in the database). For example, if an Organization had 3 addresses prior to the submission and the submission contains only one address, the OWWQX database only contained the single address after the submission had been processed.,
2. If an element was excluded, then all ancillary organization data in the database (of that type) remained unchanged.

The Source Map Scale Number was required in OWWQX schema only if the data element HorizontalCollectionMethodCode was “INTERPOLATION MAP”. In case this information is not known, the submitter could use a 1:100K scale to denote unknown for this element. An “Update-Insert” sample file is included in Appendix A.

Payload Operation: Delete

For the Delete operation, the OWWQX Back-end Application compared the unique ID for each Project, Monitoring Location, and Activity in the Payload with existing data in the OWWQX database. If the unique ID provided did not match an existing record, it was ignored. Otherwise, the existing record was deleted from the OWWQX database.

Each *Delete* request that was in the payload was made up of an Organization ID and either a Monitoring Location ID, Project ID, or Activity ID. The following is an outline of the basic types of Delete Requests that was supported.

1. Delete an Activity (and its related Field Sub-samples, Results, etc).

In this case, the Organization ID, Monitoring Location ID, and Activity ID were required to identify the Activity to delete. As a consequence of the Activity deletion, all related child records (Field Sub-sample, Results, etc.) was also deleted.

If the only remaining Activity beneath either a Monitoring Location or Project was deleted, the related Monitoring Location or Project was deleted as well.

This operation was used as a method to replace the existing data (whether it is to revise the results or reassigning activities to a new Monitoring Location or Project). The submitter could first submit a payload with the Delete operation. Once the submission was successfully processed, the submitter could then submit a payload with the Update-Insert operation.

2. Delete a Monitoring Location (and its related Activities, Field Sub-samples, Results, etc.)

In this case, the Organization ID and Monitoring Location ID were required to identify the Monitoring Location to delete. As a consequence of the Monitoring Location deletion, all related child records (Activities, Field Sub-samples, Results, etc.) were also deleted.

3. Delete a Project (and its related Activities, Field Sub-samples, Results, etc.)

In this case, the Organization ID and Project ID were required to identify the Project to delete. As a consequence of the Project deletion, all Activities that were associated with the Project had this association removed.

The OWWQX System allowed for a scenario where one Activity could relate to more than one Project. This feature had an effect on how a Project Delete Request was processed. For example, if an Activity in OWWQX relates to two Projects and only one of those Projects was being deleted, the Activity was not deleted. In this case only the reference to the Project was deleted. The end result was that the Activity now related to only one Project.

In conclusion, when a Project ID was included in an OWWQX Delete payload operation, all Activities (and Results) relating to only that Project was deleted as well. Activities (and Results) relating to additional Projects were not deleted.

A “Delete” sample file is included in Appendix B.

Submission Processing and Feedback

Before an OWWQX submission could be made to CDX, a Node user had to register with NAAS and obtain a User ID. Furthermore, a NAAS policy was established that allowed the account to invoke the Submit method on the CDX node for the OWWQX exchange.

Submission of the OWWQX Exchange Network Documents to the back-end application via the CDX Node followed the following processing steps.

1. State / local / tribal Node executed a Submit operation to CDX/EPA.
2. The entire submission zip file was archived at CDX.
3. A Transaction ID was issued to the Node submitter indicating that the file transfer was successful. (Note: the *GetStatus* response was “Received”.)
4. The submission file was validated against the Header Schema and the appropriate OWWQX Schema, where appropriate, for form and content.
 - a. Schematron was used to validate the payload. (Schematron is a technology used by CDX which permits the definition of complex business rule validation. Any relational or conditional checks would only be repeated at the backend application and including them at CDX would add significant maintenance to the flow process.) See Appendix C for a summary of the business rules.
 - b. If any XML file failed validation, the submission was terminated and the submitter received the XML validation Error Fault.
 - c. If all XML files passed validation, processing continued.
5. The Submission Zip File was transferred to the OWWQX back-end application. (Note: after this step completed, the *GetStatus* response was changed to “Pending”.)
6. The OWWQX back-end application processed the payload based on the payload operation.
7. The Processing Summary/Error Report was returned to CDX/EPA.
8. The Processing Summary/Error Report was archived at CDX. (Note: the *GetStatus* response was now either “Completed” or “Failed” based on the backend processing report.)
9. The submitter Node could obtain the status of the transaction via the *GetStatus* method provided by CDX Node web services.
 - a. The Processing Summary/Error Report was an XML-based summary of the processing that occurred on the back-end application (including processing time, insert/update/delete counts and any error or warning messages).
10. The submitter Node could retrieve the Processing Summary/Error Report via the *Download* method provided by CDX Node web services.

Prior to initiating a submit transaction with the CDX node for the OWWQX Exchange, partners were encouraged to locally pre-validate XML payload documents against the OWWQX Schema.

The version 1 of the schema was used for the pilot system and always available at the Exchange Network website.

OWWQX Data Submission Process Tutorial

The CDX Integration Test Tool Site could be used to interact with CDX in much the same way as a Node on the Exchange Network. Data providers could use it to submit an OWWQX data file for processing, check on its status and download the processing report once the file has been processed. This was a good way to interact with CDX for the OWWQX Pilot without having to have a fully configured node.

Before beginning this process, the data provider produced an XML submission file which conformed to the OWWQX schema. The XML Schema can be found on the EPA Quickplace Site. <https://epaqpx.rtp.epa.gov/owwqxpilot>

An additional resource for validating the submission was the WQX QA Services. This was not a required step in this process, but could assist the submitter during the debug process in their XML file structure/content. This was available at <https://tools.epacdxnode.net>.

To begin this tutorial, open up your browser and enter the following URL (or click the link below):

<https://test.epacdxnode.net/test/>

The Integration Test Tool home page will open with the following links on the left-hand side of the page.



Click on the Authenticate link.

The following page should appear.

U.S. Environmental Protection Agency

Authenticate

User Id: cdx

Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10

The Authenticate method authenticates a user using a supplied credential. It returns a security token when successful. The security token, also referred to as the securityToken, must be included in all other method invocations, except NodePing, as a proof of identity. Note that the address of the destination Node must be supplied here also. The address, which is located in the soap:address location field of your WSDL, will be cached by the test tool and used for all future web service calls. To change this address, return to this page.

Enter User Account and Node Address information

User Name:

Password:

Node Address:

Enter your user name and password for the CDX Test Environment. Click the Invoke button. If you don't have an account, contact the CDX help desk for assistance. Make sure you clarify that your account is for the CDX Test Environment and for the OWWQX Data Flow.

After successfully authenticating, the following screen should appear.

U.S. Environmental Protection Agency

Authentication Result

User Id: ryanj@goldsystems.com

Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10

Authenticate has been performed on the Node. The results are as follows:

Authenticate Summary	
User Name:	ryanj@goldsystems.com
Password:	*****
Node Address:	https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10
Received Security Token:	csm:jlU4Os-NzWrP3fiRqaCrHzcG8h3QCizuPytdjpVhdthR2w9CB4LOGcxj4kOIAIYp0.DqKNvf66vIpJsq6eekdHTA,,
Request SOAP:	Download
Response SOAP:	Download

Click on the “Submit” link on the left hand side of the page.

The following page will appear.

U.S. Environmental Protection Agency

Submit

User Id: ryanj@goldsystems.com

Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10

The Submit method provides a generic way of sending one or more payloads to a service provider. Payloads other than the message body are encapsulated in an array of nodeDocuments. A payload can be embedded into a nodeDocument structure as a base64 encoded value, or as a separate attachment referenced by the nodeDocument. A dataflow is a logical collection of certain kinds of documents, understandable to the sender and the ultimate receiver. Therefore, a dataflow can also be understood as a tag of the ultimate receiver of the payload. A dataflow can carry other information as well, such as network events or asynchronous database requests. Such dataflows will be identified by special URLs. A Submit message can only target to one (1) dataflow at a time.

Enter information to perform Submit		
Security Token:	<input type="text" value="csm:jU40s-NzWrP3fiRqaCrHzcG8h3QCizuPytdjpVhdtHR2w9CB4LOGcXj4k0IAI"/>	
Transaction Id:(optional)	<input type="text"/>	
Dataflow:	<input type="text" value="OWWQX"/> ▼	
Choose file:	<input type="text" value="D:\My Documents\Env\OWWQX-Pilot\Test\ExampleFiles\example_update-inse"/>	<input type="button" value="Browse..."/>
Document Type:	<input type="text" value="XML"/> ▼	
		<input type="button" value="Invoke"/>

As long as too much time has not elapsed since you authenticated, the Security Token field should be filled in for you. Otherwise, repeat the Authenticate step described previously and return to this page (by clicking the Submit link).

The Transaction Id should remain blank.

Enter “OWWQX” for the Dataflow.

Click the Browse button and find the file you wish to submit for processing. The path and file name should now appear in the “Choose file” field. Remember that submissions containing references to Attached Binary Objects must be zipped into a zip file (containing the XML file and all referenced object files (e.g. PDF, JPG, etc)).

Select the Document Type matching the file you selected (either XML or ZIP).

Click the Invoke button.

You should now see the following page (confirming the successful upload of the file).

U.S. Environmental Protection Agency

Submit Result

User Id: ryanj@goldsystems.com

Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10

Submit has been performed on the Node. The results are as follows:

Submit Summary	
Security Token:	csm:ijU4Os-NzWrP3fiRqaCrHzcG8h3QCizuPytdjpVhdtHR2w9CB4LOGcXj4kOIAIYp0.eoFiOL-M0ggcAoozjV-lzw,,,
Input Transaction ID:	
Dataflow Name:	TEST
File Name:	example_update-insert_no_objects_ryan5.xml
Document Type:	XML
Received Transaction ID:	5e4b66bb-df9f-447e-975b-b21b94117fea
Request SOAP:	Download
Response SOAP:	Download

Highlight the Transaction ID value listed on the page and copy and paste it into a text editor (such as Notepad or Word) for use later. For example, on the page above, the Transaction ID is the value 5e4b66bb-df9f-447e-975b-b21b94117fea.

Now click on the “GetStatus” link on the left-hand side of the page.

The following page should appear.

U.S. Environmental Protection Agency

GetStatus

User Id: ryanj@goldsystems.com

Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10

GetStatus is a method for transaction tracking. Once submitted, a transaction enters into different processing stages. The GetStatus method offers the client a way of querying the current state of the transaction.

Enter information to perform GetStatus	
Security Token:	<input type="text" value="csm:jU4Os-NzWrP3fiRqaCrHzcG8h3QCizuPytdjpVhdtHR2w9CB4LOGcXj4kOIAI"/>
Transaction Id:	<input type="text" value="5e4b66bb-df9f-447e-975b-b21b94117fea"/>
<input type="button" value="Invoke"/>	

As long as too much time has not elapsed since you authenticated, the Security Token field should be filled in for you. Otherwise, repeat the Authenticate step described previously and return to this page (by clicking the GetStatus link).

If the Transaction Id field is not already filled in for you, paste in the value you previously copied from the “Submit Result” page.

Click the Invoke button.

The following page should appear.

U.S. Environmental Protection Agency

GetStatus Result

User Id: ryanj@goldsystems.com

Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10

GetStatus has been performed on the Node. The results are as follows:

GetStatus Summary	
Security Token:	csm:jU4Os-NzWrP3fiRqaCrHzcG8h3QCizuPytdjpVhdtHR2w9CB4LOGcXj4kOIAIYp0.eoFiOL-M0ggcAoozjV-lzw,,,
Transaction Id:	5e4b66bb-df9f-447e-975b-b21b94117fea
Received Response:	RECEIVED
Request SOAP:	Download
Response SOAP:	Download

The Received Response field should have one of the following values:

RECEIVED: The file has been successfully received and is currently running through Schema and Schematron Validation. In this case you should wait a few minutes before checking the status again (by clicking on the GetStatus link on the left-hand side of the page and repeating the previous step).

PENDING: The file has passed Schema and Schematron Validation successfully and has been sent to the backend system to be loaded into the OWWQX Database. Send an email to Ryan Jorgensen ryanj@goldsystems.com to notify him that you have submitted a file for processing. This will allow him to make sure the backend system is running and to monitor the processing of the submission file. Since this is still a test environment and submissions are infrequent, the backend system is not running 24 hours a day. Ryan will try to respond, letting you know that the file has been processed. After Ryan's response, or if you don't hear back from him within about an hour, you can check the status again (by clicking on the GetStatus link on the left-hand side of the page). If the file has been processed by the backend system you should see one of the next two values in the Received Response field.

FAILED: The submission has either failed Schema/Schematron Validation or failed processing by the backend system.

COMPLETED: The submission has completed processing successfully by the backend system.

Once you've received either a FAILED or COMPLETED response to the GetStatus link you should go on to the next step.

Click on the Download link on the left-hand side of the page to download the processing reports.

The following page should appear.

U.S. Environmental Protection Agency

Download

User Id: ryanj@goldsystems.com

Node Address: https://dev.epacdxnode.net/cdx/services/NetworkNodePortType_V10

The Download method is often used to fulfill a requested operation. For instance, after being notified by a submitter, a node invokes the Download method to retrieve available documents. If there is a pre-established contract between the two parties, e.g., names of the documents and their availability are predetermined, then a node can actively retrieve the documents at a fixed time period without prior notification.

Enter information to perform Download	
Security Token:	<input type="text" value="csm:jU4Os-NzWrP3fiRqaCrHzcG8h3QCizuPytdjpVhdtHQ8Rg-3-hJDR5uTo1YDI"/>
Transaction Id: (optional)	<input type="text" value="be68aace-5765-489e-8e29-649e584c04e9"/>
Dataflow:	<input type="text" value="OWWQX"/> ▼
Documents (optional):	<input type="text"/>
<input type="button" value="Invoke"/>	

As long as too much time has not elapsed since you authenticated, the Security Token field should be filled in for you. Otherwise, repeat the Authenticate step described previously and return to this page (by clicking the Download link).

If the Transaction Id field is not already filled in for you, paste in the value you previously copied from the “Submit Result” page.

Fill in OWWQX for the Dataflow.

Click on the Invoke button.

The following page should appear.

NOTE: If the page doesn’t show up correctly, you may try using “FRS” for the Dataflow and repeat this step. Previously OWWQX wasn’t working on this page, but it should work now.

U.S. Environmental Protection Agency

Download Result

User Id: ryanj@goldsystems.com

Node Address: https://dev.epacdxnode.net/cdx/services/NetworkNodePortType_V10

Download has been performed on the Node. The results are as follows:

Download Summary		
Security Token:	csm:ijU4Os-NzWrP3fIRqaCrHzcG8h3QCizuPytdjpVhdtHQ8Rg-3-hJDR5uTo1YDNusK.jlorbyv3gACb9XQolWrNZw,,,	
Transaction ID:	be68aace-5765-489e-8e29-649e584c04e9	
Dataflow Name:	OWWQX	
Received Documents:		
Document Name	Document Type	Download
example_update-insert_valid.xml	XML	Download
Validation Results	XML	Download
DocumentStatus_example_update-insert_valid.xml.txt	FLAT	Download
Request SOAP:	Download	
Response SOAP:	Download	

Typically you should see two or three documents available for download.

1. Your original submission file.
2. Validation Results: This is the report produced by Schema and Schematron Validation.
3. DocumentStatus_...: This is the report produced by the backend system.

Click on the Download link of the document you wish to view.

Most browsers should then give you the option of opening or saving the document. It's recommended that you save the file locally so you can view it as needed (off-line). If you choose to open the document, you should be able to return to this page by clicking on the Back button on the browser.

Appendix A: Update-Insert Example

This section contains an example of a payload operation “Update-Insert” XML submission file which conformed to the OWWQX schema.

```
<?xml version="1.0" encoding="UTF-8" ?>
- <Document Id="YourDocIDHere"
  xmlns="http://www.exchangenetwork.net/schema/v1.0/ExchangeNetworkDocument.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
- <Header>
  <Author>Your Name</Author>
  <Organization>Your Org Name</Organization>
  <Title>OWWQX</Title>
  <CreationTime>2004-04-05T09:30:47-05:00</CreationTime>
  <Comment>This is a test file</Comment>
  <ContactInfo>Address, phone, email, etc</ContactInfo>
  </Header>
- <Payload Operation="Update-Insert">
- <OWWQX xmlns="http://exchangenetwork.net/schemas/owwqx/1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://exchangenetwork.net/schemas/owwqx/1.0
  C:\Denver\EngClients\LOCKHE~1\ITS-ESE\ESARPI~1\schema\09152005\OWWQX_OWWQX_v1.0.xsd">
- <Organization>
- <OrganizationDescription>
  <OrganizationIdentifier>TEST</OrganizationIdentifier>
  <OrganizationFormalName>Test Organization</OrganizationFormalName>
  <OrganizationDescriptionText>Here is a description of the organization.</OrganizationDescriptionText>
  </OrganizationDescription>
- <ElectronicAddress>
  <ElectronicAddressText>ryanj@goldsystems.com</ElectronicAddressText>
  <ElectronicAddressTypeName>Email</ElectronicAddressTypeName>
  </ElectronicAddress>
- <ElectronicAddress>
  <ElectronicAddressText>ryanjorgensen@mail.com</ElectronicAddressText>
  <ElectronicAddressTypeName>Email</ElectronicAddressTypeName>
  </ElectronicAddress>
- <Telephonic>
  <TelephoneNumberText>801-485-7445</TelephoneNumberText>
  <TelephoneNumberTypeName>Office</TelephoneNumberTypeName>
  <TelephoneExtensionNumberText />
  </Telephonic>
- <Telephonic>
```

```

<TelephoneNumberText>801-485-7446</TelephoneNumberText>
<TelephoneNumberTypeName>Fax</TelephoneNumberTypeName>
<TelephoneExtensionNumberText>String</TelephoneExtensionNumberText>
  </Telephonic>
- <OrganizationAddress>
  <AddressTypeName>Mailing</AddressTypeName>
  <LocationAddressText>1</LocationAddressText>
  <SupplementalAddressText>String</SupplementalAddressText>
  <LocalityName>String</LocalityName>
  <StateCode>NJ</StateCode>
  <AddressPostalCode AddressPostalCodeContext="String">String</AddressPostalCode>
  <CountryCode>US</CountryCode>
  <CountyCode>015</CountyCode>
  <TribalCode>001</TribalCode>
  </OrganizationAddress>
- <Project>
  <ProjectIdentifier>Project1</ProjectIdentifier>
  <ProjectName>String</ProjectName>
  <ProjectDescriptionText>1</ProjectDescriptionText>
  </Project>
- <Project>
  <ProjectIdentifier>Project2</ProjectIdentifier>
  <ProjectName>String 2</ProjectName>
  <ProjectDescriptionText>sdss 1</ProjectDescriptionText>
  </Project>
- <MonitoringLocation>
- <MonitoringLocationIdentity>
  <MonitoringLocationIdentifier MonitoringLocationIdentifierContext="String">Monitoring Location
  1</MonitoringLocationIdentifier>
  <MonitoringLocationName>String</MonitoringLocationName>
  <MonitoringLocationTypeName>Ocean</MonitoringLocationTypeName>
  <MonitoringLocationDescriptionText>String</MonitoringLocationDescriptionText>
  </MonitoringLocationIdentity>
- <MonitoringLocationGeospatial>
  <LatitudeMeasure>3.141592</LatitudeMeasure>
  <LongitudeMeasure>3.141592</LongitudeMeasure>
  <SourceMapScaleNumber>1</SourceMapScaleNumber>
  <HorizontalCollectionMethodCode>ADDRESS MATCHING-NEAREST
  INTERSECTION</HorizontalCollectionMethodCode>
  <HorizontalReferenceDatumCode>NAD27</HorizontalReferenceDatumCode>

```

```

<VerticalMeasure>2</VerticalMeasure>
<VerticalMeasureUnitCode>ft</VerticalMeasureUnitCode>
<VerticalCollectionMethodCode>OTHER</VerticalCollectionMethodCode>
<VerticalReferenceDatumCode>NAVD88</VerticalReferenceDatumCode>
<CountryCode>US</CountryCode>
<StateCode>NJ</StateCode>
<CountyCode>015</CountyCode>
  </MonitoringLocationGeospatial>
- <Activity>
- <ActivityDescription>
  <ActivityIdentifier>10001</ActivityIdentifier>
  <ActivityTypeCode>Field Msr/Obs-Portable Data Logger</ActivityTypeCode>
  <ActivityMediaText>Biological Tissue</ActivityMediaText>
  <ActivityMediaSubdivisionText>Surface soil/sediment</ActivityMediaSubdivisionText>
  <ActivityStartDate>1967-08-13</ActivityStartDate>
  <ActivityStartTime>14:20:00-05:00</ActivityStartTime>
  <ActivityEndDate>1967-08-13</ActivityEndDate>
  <ActivityEndTime>14:20:00-05:00</ActivityEndTime>
  <ActivityDepthAltitudeMeasureValue />
  <ActivityTopDepthAltitudeMeasureValue />
  <ActivityBottomDepthAltitudeMeasureValue />
  <ActivityDepthAltitudeMeasureUnitCode>ft</ActivityDepthAltitudeMeasureUnitCode>
  <ActivityDepthAltitudeReferencePointText>String</ActivityDepthAltitudeReferencePointText>
  <ActivityAssignmentProjectIdentifier>Project1</ActivityAssignmentProjectIdentifier>
  <ActivityConductingOrganizationText>Example Organization Name</ActivityConductingOrganizationText>
  <ActivityCommentText>String</ActivityCommentText>
  </ActivityDescription>
- <ActivityLocation>
  <LatitudeMeasure>2</LatitudeMeasure>
  <LongitudeMeasure>-12121212</LongitudeMeasure>
  <SourceMapScaleNumber>2</SourceMapScaleNumber>
  <HorizontalCollectionMethodCode>ADDRESS MATCHING-NEAREST
    INTERSECTION</HorizontalCollectionMethodCode>
  <HorizontalReferenceDatumCode>NAD27</HorizontalReferenceDatumCode>
  </ActivityLocation>
- <SampleDescription>
  <SampleCollectionMethodText>String</SampleCollectionMethodText>
  <SampleTissueTaxonomicName>Apristurus</SampleTissueTaxonomicName>
  <SampleTissueAnatomyName>Body</SampleTissueAnatomyName>
  <SampleCollectionEquipmentCode>Hand corer</SampleCollectionEquipmentCode>

```

```

- <SamplePreparation>
  <SamplePreparationMethodText>String</SamplePreparationMethodText>
  <SampleHoldingContainerMaterialCode>Aluminum Dish</SampleHoldingContainerMaterialCode>
  <SampleHoldingContainerColorCode>Clear</SampleHoldingContainerColorCode>
  <SamplePreservationChemicalText>String</SamplePreservationChemicalText>
  <SamplePreservationThermalCode>Wet Ice (4 deg C)</SamplePreservationThermalCode>
  <SampleTransportStorageDescription>My special storage method</SampleTransportStorageDescription>
- <SampleSubsampleDescription>
  <SubsampleIdentifier>1</SubsampleIdentifier>
  <SubsampleCommentText>Comments for subsample 1</SubsampleCommentText>
  </SampleSubsampleDescription>
  </SamplePreparation>
- <SamplePreparation>
  <SamplePreparationMethodText>String</SamplePreparationMethodText>
  <SampleHoldingContainerMaterialCode>Aluminum Dish</SampleHoldingContainerMaterialCode>
  <SampleHoldingContainerColorCode>Clear</SampleHoldingContainerColorCode>
  <SamplePreservationChemicalText>String</SamplePreservationChemicalText>
  <SamplePreservationThermalCode>Wet Ice (4 deg C)</SamplePreservationThermalCode>
  <SampleTransportStorageDescription>My special storage method</SampleTransportStorageDescription>
- <SampleSubsampleDescription>
  <SubsampleIdentifier>2</SubsampleIdentifier>
  <SubsampleCommentText>Comments for subsample 1</SubsampleCommentText>
  </SampleSubsampleDescription>
  </SamplePreparation>
  </SampleDescription>
- <Result>
- <ResultDescription>
  <PortableDataLoggerLineName>1</PortableDataLoggerLineName>
  <ResultDetectionConditionText />
  <CharacteristicName>2-Propen-1-ol</CharacteristicName>
  <ResultSampleFractionText>Total</ResultSampleFractionText>
  <ResultValueMeasure>1</ResultValueMeasure>
  <ResultValueMeasureUnitCode>mg/l</ResultValueMeasureUnitCode>
  <ResultStatusText>Preliminary</ResultStatusText>
  <ResultStatisticalBaseCode>Mean</ResultStatisticalBaseCode>
  <ResultValueTypeName>Actual</ResultValueTypeName>
  <ResultWeightBasisText>Wet</ResultWeightBasisText>
  <ResultTimeBasisText>24 Hours</ResultTimeBasisText>
  <ResultTemperatureBasisText>10 Deg C</ResultTemperatureBasisText>

```

```

<ResultParticleSizeBasisText>String</ResultParticleSizeBasisText>
<ResultValueMeasurePrecisionText>String</ResultValueMeasurePrecisionText>
<ResultBiasText>String</ResultBiasText>
<ResultCommentText>String</ResultCommentText>
<SubsampleIdentifier>1</SubsampleIdentifier>
  </ResultDescription>
- <ResultAnalyticalMethod>
  <MethodIdentifierCode>String</MethodIdentifierCode>
  <MethodIdentifierCodeListIdentifier CodeListVersionIdentifier="String"
    CodeListVersionAgencyIdentifier="String">String</MethodIdentifierCodeListIdentifier>
  <MethodName>String</MethodName>
  </ResultAnalyticalMethod>
- <ResultLabInformation>
  <LaboratoryName>String</LaboratoryName>
  <AnalysisDate>1967-08-13</AnalysisDate>
  <AnalysisTime>14:20:00-05:00</AnalysisTime>
  <ResultLaboratoryCommentCode>LIS</ResultLaboratoryCommentCode>
- <ResultDetectionQuantitationLevel>
  <DetectionQuantitationLevelTypeName>Method detection level (MDL)</DetectionQuantitationLevelTypeName>
  <DetectionQuantitationLevelMeasure>0.5</DetectionQuantitationLevelMeasure>
  <DetectionQuantitationLevelMeasureUnitCode>mg/l</DetectionQuantitationLevelMeasureUnitCode>
  </ResultDetectionQuantitationLevel>
  </ResultLabInformation>
- <LabSamplePreparation>
- <LabSamplePreparationMethod>
  <MethodIdentifierCode>Method001</MethodIdentifierCode>
  <MethodIdentifierCodeListIdentifier CodeListVersionIdentifier="String"
    CodeListVersionAgencyIdentifier="String">NELAC</MethodIdentifierCodeListIdentifier>
  <MethodName>s</MethodName>
  </LabSamplePreparationMethod>
  <LabSamplePreparationDate>1967-08-13</LabSamplePreparationDate>
  <LabSamplePreparationTime>14:20:00-05:00</LabSamplePreparationTime>
  </LabSamplePreparation>
  </Result>
  </Activity>
  </MonitoringLocation>
- <MonitoringLocation>
- <MonitoringLocationIdentity>
  <MonitoringLocationIdentifier MonitoringLocationIdentifierContext="String">Monitoring Location
    2</MonitoringLocationIdentifier>
  <MonitoringLocationName>String</MonitoringLocationName>

```

```

<MonitoringLocationTypeName>Estuary</MonitoringLocationTypeName>
<MonitoringLocationDescriptionText>String</MonitoringLocationDescriptionText>
  </MonitoringLocationIdentity>
- <MonitoringLocationGeospatial>
  <LatitudeMeasure>3.141592</LatitudeMeasure>
  <LongitudeMeasure>3.141592</LongitudeMeasure>
  <SourceMapScaleNumber>1</SourceMapScaleNumber>
  <HorizontalCollectionMethodCode>ADDRESS MATCHING-NEAREST
    INTERSECTION</HorizontalCollectionMethodCode>
  <HorizontalReferenceDatumCode>NAD27</HorizontalReferenceDatumCode>
  <VerticalMeasure>1000</VerticalMeasure>
  <VerticalMeasureUnitCode>ft</VerticalMeasureUnitCode>
  <VerticalCollectionMethodCode>GPS CODE (PSEUDO RANGE) DIFFERENTIAL</VerticalCollectionMethodCode>
  <VerticalReferenceDatumCode>NAVD88</VerticalReferenceDatumCode>
  <CountryCode>US</CountryCode>
  <StateCode>NJ</StateCode>
  <CountyCode />
  </MonitoringLocationGeospatial>
- <Activity>
- <ActivityDescription>
  <ActivityIdentifier>10002</ActivityIdentifier>
  <ActivityTypeCode>Sample-Integrated Vertical Profile</ActivityTypeCode>
  <ActivityMediaText>Water</ActivityMediaText>
  <ActivityMediaSubdivisionText>Groundwater</ActivityMediaSubdivisionText>
  <ActivityStartDate>1967-08-13</ActivityStartDate>
  <ActivityStartTime>14:20:00Z</ActivityStartTime>
  <ActivityEndDate>1967-08-13</ActivityEndDate>
  <ActivityEndTime>14:20:00</ActivityEndTime>
  <ActivityDepthAltitudeMeasureValue />
  <ActivityTopDepthAltitudeMeasureValue>12.2</ActivityTopDepthAltitudeMeasureValue>
  <ActivityBottomDepthAltitudeMeasureValue>2.2</ActivityBottomDepthAltitudeMeasureValue>
  <ActivityDepthAltitudeMeasureUnitCode>ft</ActivityDepthAltitudeMeasureUnitCode>
  <ActivityDepthAltitudeReferencePointText>text here</ActivityDepthAltitudeReferencePointText>
  <ActivityAssignmentProjectIdentifier>Project1</ActivityAssignmentProjectIdentifier>
  <ActivityConductingOrganizationText>Example Organization Name 2</ActivityConductingOrganizationText>
  <ActivityCommentText>String</ActivityCommentText>
  </ActivityDescription>
- <ActivityLocation>
  <LatitudeMeasure>3.141592</LatitudeMeasure>
  <LongitudeMeasure>3.141592</LongitudeMeasure>

```

```

<SourceMapScaleNumber>2</SourceMapScaleNumber>
<HorizontalCollectionMethodCode>ADDRESS MATCHING-NEAREST
INTERSECTION</HorizontalCollectionMethodCode>
<HorizontalReferenceDatumCode>NAD27</HorizontalReferenceDatumCode>
  </ActivityLocation>
- <SampleDescription>
  <SampleCollectionMethodText>String</SampleCollectionMethodText>
  <SampleTissueTaxonomicName>Aprionodon</SampleTissueTaxonomicName>
  <SampleTissueAnatomyName>Skin</SampleTissueAnatomyName>
  <SampleCollectionEquipmentCode>Bucket</SampleCollectionEquipmentCode>
- <SamplePreparation>
  <SamplePreparationMethodText>String</SamplePreparationMethodText>
  <SampleHoldingContainerMaterialCode>Plastic Bag</SampleHoldingContainerMaterialCode>
  <SampleHoldingContainerColorCode>Amber</SampleHoldingContainerColorCode>
  <SamplePreservationChemicalText>String</SamplePreservationChemicalText>
  <SamplePreservationThermalCode>None</SamplePreservationThermalCode>
  <SampleTransportStorageDescription>test</SampleTransportStorageDescription>
    </SamplePreparation>
    </SampleDescription>
- <Result>
- <ResultDescription>
  <PortableDataLoggerLineName />
  <ResultDetectionConditionText>Not Detected</ResultDetectionConditionText>
  <CharacteristicName>3-Methyl-1,1'-biphenyl</CharacteristicName>
  <ResultSampleFractionText>Total Recoverable</ResultSampleFractionText>
  <ResultValueMeasure />
  <ResultValueMeasureUnitCode>mg/l</ResultValueMeasureUnitCode>
  <ResultStatusText>Preliminary</ResultStatusText>
  <ResultStatisticalBaseCode>Maximum</ResultStatisticalBaseCode>
  <ResultValueTypeName>Actual</ResultValueTypeName>
  <ResultWeightBasisText />
  <ResultTimeBasisText />
  <ResultTemperatureBasisText />
  <ResultParticleSizeBasisText>String</ResultParticleSizeBasisText>
  <ResultValueMeasurePrecisionText>String</ResultValueMeasurePrecisionText>
  <ResultBiasText>String</ResultBiasText>
  <ResultCommentText>String</ResultCommentText>
  <SubsampleIdentifier />
    </ResultDescription>
- <ResultAnalyticalMethod>

```

```

<MethodIdentifierCode>String</MethodIdentifierCode>
<MethodIdentifierCodeListIdentifier CodeListVersionIdentifier="String"
  CodeListVersionAgencyIdentifier="String">String</MethodIdentifierCodeListIdentifier>
<MethodName>String</MethodName>
  </ResultAnalyticalMethod>
- <ResultLabInformation>
  <LaboratoryName>String</LaboratoryName>
  <AnalysisDate>1967-08-13</AnalysisDate>
  <AnalysisTime>14:20:00-05:00</AnalysisTime>
  <ResultLaboratoryCommentCode>CNT</ResultLaboratoryCommentCode>
- <ResultDetectionQuantitationLevel>
  <DetectionQuantitationLevelTypeName>Method detection level (MDL)</DetectionQuantitationLevelTypeName>
  <DetectionQuantitationLevelMeasure>1</DetectionQuantitationLevelMeasure>
  <DetectionQuantitationLevelMeasureUnitCode>mg/l</DetectionQuantitationLevelMeasureUnitCode>
  </ResultDetectionQuantitationLevel>
  </ResultLabInformation>
- <LabSamplePreparation>
- <LabSamplePreparationMethod>
  <MethodIdentifierCode>Method001</MethodIdentifierCode>
  <MethodIdentifierCodeListIdentifier CodeListVersionIdentifier="String"
    CodeListVersionAgencyIdentifier="String">NELAC</MethodIdentifierCodeListIdentifier>
  <MethodName>Method11</MethodName>
  </LabSamplePreparationMethod>
  <LabSamplePreparationDate>1999-01-01</LabSamplePreparationDate>
  </LabSamplePreparation>
  </Result>
  </Activity>
  </MonitoringLocation>
  </Organization>
  </OWWQX>
  </Payload>
  </Document>

```

Appendix B: Delete

This section contains an example of a payload operation “Delete” XML submission file which conformed to the OWWQX schema.

```
<?xml version="1.0" encoding="UTF-8" ?>
<Document Id="YourDocIDHere"
  xmlns="http://www.exchangenetwork.net/schema/v1.0/ExchangeNetworkDocument.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <Header>
    <Author>Your Name</Author>
    <Organization>Your Org Name</Organization>
    <Title>OWWQX</Title>
    <CreationTime>2004-04-05T09:30:47-05:00</CreationTime>
    <Comment>This is a test file</Comment>
    <ContactInfo>Address, phone, email, etc</ContactInfo>
  </Header>
  <Payload Operation="Delete">
    <OWWQXDelete xmlns="http://exchangenetwork.net/schemas/owwqx/1.0"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:schemaLocation="http://exchangenetwork.net/schemas/owwqx/1.0
        C:\Denver\EngClients\LOCKHE~1\ITS-
        ESEIESARPI~1\schemas\10032005\OWWQX_OWWQX_Delete_v1.0.xsd">
      <OrganizationDelete>
        <OrganizationIdentifier>TEST</OrganizationIdentifier>
        <ProjectIdentifier>Project2</ProjectIdentifier>
      <MonitoringLocationDelete>
        <MonitoringLocationIdentifier MonitoringLocationIdentifierContext="MichiganDEQ">Monitoring Location
          2</MonitoringLocationIdentifier>
        <ActivityIdentifier>10002</ActivityIdentifier>
      </MonitoringLocationDelete>
      <MonitoringLocationDelete>
        <MonitoringLocationIdentifier MonitoringLocationIdentifierContext="MichiganDEQ">Monitoring Location
          1</MonitoringLocationIdentifier>
      </MonitoringLocationDelete>
    </OrganizationDelete>
  </OWWQXDelete>
</Payload>
</Document>
```


Appendix C: Data Dictionary

A copy of the OWWQX data dictionary can be found on the EPA Quickplace Site.

<https://epaqpx.rtp.epa.gov/owwqx/pilot>

The following table lists a summary of the business rules enforced by the Schematron.

Summary of Business Rules (Enforced by Schematron)

Rule 1: ElectronicAddressText is required when ElectronicAddressTypeName is reported.

Rule 2: ElectronicAddressText tags are required when ElectronicAddressTypeName is reported.

Rule 3: ElectronicAddressTypeName is required when ElectronicAddressText is reported.

Rule 4: ElectronicAddressTypeName tags are required when ElectronicAddressText is reported.

Rule 5: TelephoneNumberText is required when TelephoneNumberTypeName is reported.

Rule 6: TelephoneNumberText tags are required when TelephoneNumberTypeName is reported.

Rule 7: TelephoneNumberTypeName is required when TelephoneNumberText is reported.

Rule 8: TelephoneNumberTypeName tags are required when TelephoneNumberText is reported.

Rule 9: LocationAddressText is required when AddressTypeName is reported.

Rule 10: LocationAddressText tags are required when AddressTypeName is reported.

Rule 11: AddressTypeName is required when LocationAddressText is reported.

Rule 12: AddressTypeName tags are required when LocationAddressText is reported.

Rule 13: Source Map Scale Number is required when HorizontalCollectionMethod Code is INTERPOLATION-MAP.

Rule 14: VerticalMeasureUnitCode is required when VerticalMeasure is reported.

Rule 15: VerticalCollectionMethodCode is required when VerticalMeasure is reported.

Rule 16: VerticalReferenceDatumCode is required when VerticalMeasure is reported.

Rule 17: Not used

Rule 18: Not used

Rule 19: Not used

Rule 20: Not used

Rule 21: Either ProjectDescriptionText or Project BinaryObject is required.

Rule 22: BinaryObjectFileName is required when BinaryObjectContent is reported.

Rule 23: BinaryObjectFileTypeCode is required when BinaryObjectContent is reported.

Rule 24: Not used

Rule 25: ActivityDepthAltitudeMeasureValue and ActivityTopDepthAltitudeMeasureValue cannot both be reported.

Rule 26: ActivityDepthAltitudeMeasureValue and ActivityBottomDepthAltitudeMeasureValue cannot both be reported.

Rule 27: Either ActivityDepthAltitudeMeasureValue or ActivityTopDepthAltitudeMeasureValue must be reported when activity type contains the word 'Sample'

Rule 28: Either ActivityDepthAltitudeMeasureValue or ActivityBottomDepthAltitudeMeasureValue must be reported when activity type contains the word 'Sample'

Rule 29: ActivityTopDepthAltitudeMeasureValue must be reported when activity type is Sample-Integrated Vertical Profile.

Rule 30: ActivityBottomDepthAltitudeMeasureValue must be reported when activity type is Sample-Integrated Vertical Profile.

Rule 31: ActivityDepthAltitudeMeasureUnitCode must be reported when activity type contains the word 'Sample'

Rule 32: ActivityDepthAltitudeReferencePointText must be reported when activity type contains the word 'Sample'

Rule 33: Source Map Scale Number is required when HorizontalCollectionMethod Code is Map Interpolation.

Rule 34: SampleTissueTaxonomicName is required when SampleTissueAnatomyName is reported.

Rule 35: SampleTissueAnatomyName is required when SampleTissueTaxonomicName is reported.

Rule 36: Not used

Rule 37: Not used

Rule 38: Not used

Rule 39: Not used

Rule 40: Not used

Rule 41: PortableDataLoggerLineName is required when ActivityTypeCode contains Data Logger.

Rule 42: SampleCollectionMethodText must be reported when activity type contains the word 'Sample'.

Rule 43: SampleTissueTaxonomicName must be reported when ActivityMediaText contains the word 'Tissue'.

Rule 44: SampleTissueAnatomyName must be reported when ActivityMediaText contains the word 'Tissue'.

Rule 45: Not used

Rule 46: Not used

Rule 47: Not used

Rule 48: Not used

Rule 49: Not used

Rule 50: Not used

Rule 51: DetectionQuantitationLevelTypeName is required if ResultDetectionConditionText contains the word 'Quantification'

Rule 52: DetectionQuantitationLevelTypeName tags are required if ResultDetectionConditionText contains the word 'Quantification'

Rule 53: DetectionQuantitationLevelTypeName is required if ResultDetectionConditionText is 'Not Detected'

Rule 54: DetectionQuantitationLevelTypeName is required if ResultDetectionConditionText is 'Not Detected'

Rule 55: DetectionQuantitationLevelMeasure is required if ResultDetectionConditionText is 'Not Detected'

Rule 56: DetectionQuantitationLevelMeasure is required if ResultDetectionConditionText is 'Not Detected'

Rule 57: Either ResultValueMeasure or ResultDetectionConditionText must be reported

Rule 58: ResultValueMeasure and ResultDetectionConditionText cannot both be reported at the same time

Rule 59: CharacteristicName must be reported if ResultValueMeasure is reported.

Rule 60: CharacteristicName tags must be reported if ResultValueMeasure is reported.

Rule 61: ResultStatusText must be reported if ResultValueMeasure is reported

Rule 62: ResultStatusText tags must be reported if ResultValueMeasure is reported

Rule 63: DetectionQuantitationLevelMeasureUnitCode must be reported if DetectionQuantitationLevelMeasure is reported.

Rule 64: DetectionQuantitationLevelMeasureUnitCode tags must be reported if DetectionQuantitationLevelMeasure is reported.

Rule 65: Lab Sample Preparation MethodIdentifierCodeListIdentifier must be reported if Lab Sample Preparation MethodIdentifierCode is reported

Rule 66: Lab Sample Preparation MethodName must be reported if Lab Sample Preparation MethodIdentifierCode is reported

The following rules check each field against a lookup table with reference values:

Rule DB-1: TelephoneNumberTypeName

Rule DB-2: StateCode has a wrong value

Rule DB-3: CountryCode

Rule DB-4: CountyCode

Rule DB-5: TribalCode

Rule DB-6: MonitoringLocationTypeName

Rule DB-7: HorizontalCollectionMethodCode

Rule DB-8: HorizontalReferenceDatumCode
Rule DB-9: VerticalMeasureUnitCode
Rule DB-10: VerticalCollectionMethodCode
Rule DB-11: VerticalReferenceDatumCode
Rule DB-12: ActivityTypeCode
Rule DB-13: ActivityMediaText
Rule DB-14: ActivityMediaSubDivisionText
Rule DB-15: ActivityDepthAltitudeMeasureUnitCode
Rule DB-16: SampleTissueTaxonomicName
Rule DB-17: SampleTissueAnatomyName
Rule DB-18: SampleCollectionEquipmentCode
Rule DB-19: SampleHoldingContainerMaterialCode
Rule DB-20: SampleHoldingContainerColorCode
Rule DB-21: SamplePreservationThermalCode
Rule DB-22: SubsampleHoldingContainerMaterialCode
Rule DB-23: SubsampleHoldingContainerColorCode
Rule DB-24: SubsamplePreservationThermalCode
Rule DB-25: CharacteristicName
Rule DB-26: ResultSampleFractionText
Rule DB-27: ResultValueMeasureUnitCode
Rule DB-28: ResultStatusText
Rule DB-29: ResultStatisticalBaseCode
Rule DB-30: ResultValueTypeName
Rule DB-31: ResultWeightBasisText
Rule DB-32: ResultTimeBasisText
Rule DB-33: ResultTemperatureBasisText
Rule DB-34: ResultLaboratoryCommentCode
Rule DB-35: DetectionQuantitationLevelTypeName
Rule DB-36: DetectionQuantitationLevelMeasureUnitCode