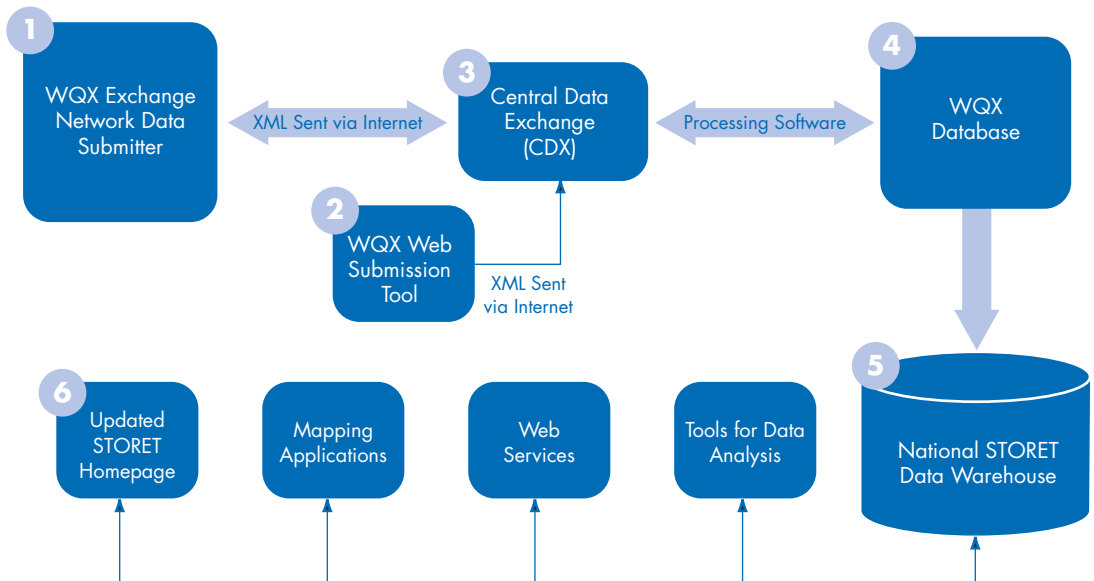# Water Quality Exchange

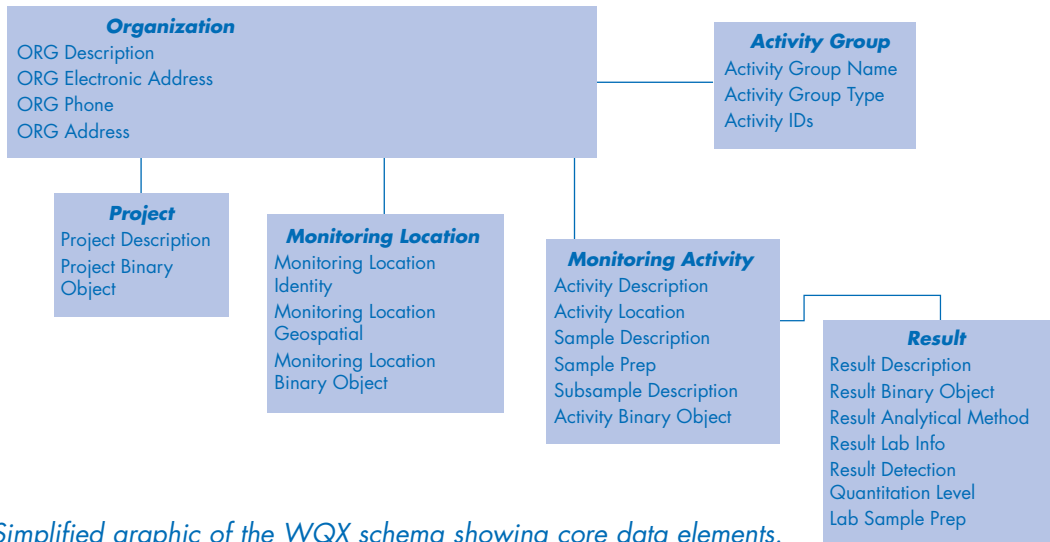## What Is Water Quality Exchange (WQX)?

- **WQX is a framework that uses data and internet standards** to submit ambient water quality monitoring data to the STORET Warehouse. WQX has replaced the distributed STORET database as the primary way of submitting data.

- **WQX uses the standards of the National Environmental Information Exchange Network** to facilitate data sharing with EPA.

- **The WQX schema** is a standard set of data formats that specify the data elements and data structure required for submission of data to EPA. The WQX schema is an implementation of the Environmental Sampling, Analysis, and Results (ESAR) data standard, developed by states and EPA.

How Does the WQX Data Flow Work?

1 WQX Exchange Network Data Submitter

← XML Sent via Internet →

3 Central Data Exchange (CDX)

← Processing Software →

4 WQX Database

2 WQX Web Submission Tool

XML Sent via Internet

6 Updated STORET Homepage

Mapping Applications

Web Services

Tools for Data Analysis

5 National STORET Data Warehouse

1 Data are submitted to the WQX system using XML in the format of the WQX schema.

2 Alternatively, users may submit data using WQX Web, a submission tool that generates XML.

3 WQX data come in to EPA through the Central Data Exchange (CDX). CDX is EPA's presence on the Exchange Network, and all data submitted to EPA must come through CDX for user authentication and data validation.

4 The WQX database receives the data after they are processed to fit into the database format.

5 The data are then put into the National STORET Data Warehouse, where they can be accessed for data retrieval through:

6 The STORET Warehouse query application, the STORET web services, EPA mapping applications such as EnviroMapper for Water and MyEnvironment, and other applications built for data access.

The WQX Schema

Organization
ORG Description
ORG Electronic Address
ORG Phone
ORG Address

Activity Group
Activity Group Name
Activity Group Type
Activity IDs

Project
Project Description
Project Binary
Object

Monitoring Location
Monitoring Location
Identity
Monitoring Location
Geospatial
Monitoring Location
Binary Object

Monitoring Activity
Activity Description
Activity Location
Sample Description
Sample Prep
Subsample Description
Activity Binary Object

Result
Result Description
Result Binary Object
Result Analytical Method
Result Lab Info
Result Detection
Quantitation Level
Lab Sample Prep

Simplified graphic of the WQX schema showing core data elements.

- The WQX schema represents a more streamlined set of data elements than the distributed STORET database model yet still provides for complete reporting of water quality monitoring, from field measurements and observations to samples and subsamples.

- The major components of the WQX schema follow the ESAR data standard closely, and many of the data elements in WQX share the same names and definitions as the data elements in ESAR.

- The WQX schema includes:
  - The physical conditions in the environment at the time of a site visit.
  - The chemical and bacteriological make-up of the water sampled.
  - Chemical analyses of fish tissue collected.
  - Biological Taxon Abundance data, including population census, frequency class, group summaries, and individual results.
  - Toxicity data.
  - Habitat Assessment scores and their related metric scores.
  - Biological Index scores and their related metric scores.

Ways of Submitting Data

- Users may submit WQX-compatible data using Exchange Network Nodes or Node Clients.
- The WQX Web tool provides users with a web-based application that converts text files into WQX-compatible XML files and submits them via EPA's Central Data Exchange (CDX).

What About STORET?

- The distributed STORET database is no longer being supported by EPA as a means for submitting data to the STORET Warehouse.

- While many states and tribes have begun to use WQX and WQX Web to submit data, EPA continues to work with organizations in their transition to the use of WQX.

- The STORET Warehouse continues to be EPA's repository of ambient water quality monitoring data. EPA continues to enhance data access from the STORET Warehouse with web services, and better query capabilities.

STORET