



Solicitation Information  
7 June 06

Request for Proposals # B06428

Title: NEIEN Node and Water Quality Information System - RIDEM

Submission Deadlines: 20 July 06 @ 2:20 PM (Eastern Time)

**PRE-BID CONFERENCE: No**

Questions concerning this solicitation may be e-mailed, in Microsoft Word format, to the Division of Purchases at [questions@purchasing.state.ri.us](mailto:questions@purchasing.state.ri.us) no later than 22 June 06 @ 12:00 noon EDT. Please reference the RFP# on all correspondence. Answers to questions received, if any, will be posted on the Internet as an addendum to this solicitation. It is the responsibility of all interested parties to download this information.

**SURETY REQUIRED: No**

**BOND REQUIRED: No**

Jerome D. Moynihan, C.P.M., CPPO  
Administrator of Purchasing Systems

Vendors must register on-line at the State Purchasing Website at [www.purchasing.state.ri.us](http://www.purchasing.state.ri.us)

**NOTE TO VENDORS:**

Offers not accompanied by a completed and signed Bidder Certification Cover Form may not be considered.

**THIS PAGE IS NOT A BIDDER CERTIFICATION FORM**

## INTRODUCTION

The Department of Administration/Office of Purchases, on behalf of the Rhode Island Department of Environmental Management (RIDEM) is soliciting proposals from qualified technical consultants to provide written technical and administrative plans, design specifications, hardware and software recommendations and the installation of a Network Exchange Node and a complementary Water Quality Database. This is requested in accordance with the terms of the Request for Proposals and the State's Conditions of Purchase, which may be obtained at the Rhode Island Division of Purchases Home Page by Internet at [www.purchasing.ri.gov](http://www.purchasing.ri.gov).

The U.S. Environmental Protection Agency (EPA) and state environmental agencies have partnered to develop the National Environmental Information Exchange Network (NEIEN or Exchange Network). The NEIEN is an Internet and standards based approach for exchanging information and simplifying regulatory reporting requirements. Built on principles of applying data standards, providing secure, real-time access, and electronically collecting and storing accurate information, the Exchange Network will replace and complement traditional approaches to exchanging environmental information. To read more about NEIEN please go to [www.exchangenetwork.net](http://www.exchangenetwork.net).

The EPA has provided support for 100% state participation by awarding implementation grants. RI has been awarded this money to implement the technology and is one of the few remaining states not yet active on the Exchange Network. The EPA has mandated the flow of water quality data to (STORET) be complete by November 2006. In addition, the facility information stored in RIDEM's Permit Licenses and Other Vital Environmental Records (PLOVER) information system must be validated and uploaded to EPA's Facility Registry System (FRS) warehouse before other data flows can be initiated. The Department of Health (DOH) has also participated in a NEIEN challenge grant to use this node to flow a subset of its laboratory data from the LIMS system to EPA via XML exchange. Completing this project will reduce the complexity of fulfilling current EPA required reporting as well as provide the tools for future data exchanges with EPA and interested parties.

The vision is to design the infrastructure to exchange environmental information between the EPA and Rhode Island agencies. This will in turn reduce the resources needed to build and maintain interfaces and perform data entry activities. EPA to state and state-to-state exchanges allow multiple state and federal information data-sets to be viewed, analyzed and interpreted to improve the understanding of changing environmental conditions. This project will improve data quality by incorporating data standards up front and establishing standard business rules in the XML schema used to package the information exchange.

## INSTRUCTIONS AND NOTIFICATIONS TO BIDDERS:

- All respondents MUST register online at the RIVIP's Internet website @ [www.purchasing.ri.gov](http://www.purchasing.ri.gov). Proposals must be in accordance with the guidelines outlined in this request and the state's general conditions of purchasing which can be accessed through the website.
- A fully completed and *signed RIVIP Bidder Certification Cover Sheet - All three pages* should accompany response submitted. Failure to make a complete submission inclusive of this three-page document **may result in disqualification**.
- Should there be a need for technical assistance in registering, and/or downloading any document, call the RIVIP HELP DESK@ (401) 222-2142, ext. 134. Office Hours: Monday thru Friday, 8:30 AM - 4:00 PM.
- All costs associated with developing or submitting documents in response to this request and/or in providing oral or written clarification of its content shall be borne by the respondent. The State assumes no responsibility for these costs.
- It is intended that an award pursuant to this Request will be made to a prime respondent, who will assume responsibility for all aspects of the work.
- All pricing submitted will be considered to be *firm and fixed* unless otherwise indicated herein.
- Submission in response to this solicitation are considered to be irrevocable for a period of not less than sixty (60) days following the established due date and may not be withdrawn without the express written permission of the State Purchasing Agent.
- Responses misdirected to the other State locations or which otherwise are not received by the State Division of Purchases by the established due date for any cause will be determined to be late and may not be considered. The office clock, for the purpose of registering the arrival of a document, is in the reception area of the Department of Administration (DOA), Division of Purchases, One Capitol Hill, Providence, Rhode Island.
- Respondents are advised that all materials submitted to the State for consideration will be considered to be public records as defined in Title 38, Chapter 2 of Rhode Island General Laws, without exception, and will be released for inspection immediately upon request once an award is made.

- During the life of the contract, the State reserves the right to solicit separately for selected initiatives within this scope of work.
- The State of Rhode Island has a goal of ten per cent (10%) participation by Minority Business Enterprises (MBE) in all State procurements. For further information, visit the website [www.rimbe.org](http://www.rimbe.org). To speak with an M.B.E. Officer, call (401) 222-6253.
- Interested parties are instructed to peruse the Division of Purchases website on a regular basis, as additional information relating to this solicitation may be released in the form of an addendum to this RFP/LOI
- The detail of work is outlined in the section entitled "Scope of Work". Work should begin by, on, or about April 2006. The initial contract for services is envisioned to be completed within 9 months. The funds for the contract have been procured and will be encumbered up to \$250,000.
- Proposal misdirected to other State locations or which are otherwise not present in the Office of Purchases at the time of opening for any cause will be determined to be late and will not be considered. FAXED OR E-MAILED PROPOSALS WILL NOT BE CONSIDERED. The official time clock is located in the reception area of the Division of Purchases.
- In accordance with Title 7, Chapter 1.1 of the General Laws of Rhode Island, no foreign corporation, a corporation without a Rhode Island business address, shall have the right to transact businesses in the state until it shall have procured a Certificate of Authority to do so from the Rhode Island Secretary of State (401) 222-3040.
- Respondents will be responsible for determining the level of success of their activities through use of appropriate process and outcome measurements. Each activity must produce an identifiable deliverable or a measurable outcome.
- Respondents are instructed to submit a **combined Technical/Cost Proposal** response described in detail herein.

*Note:* This is a Request for Proposals (RFP), not an invitation for BID: *responses will be evaluated on the basis of the relative merits of the proposal, in addition to price.* There will be no public opening and reading of responses received by the Office of Purchases pursuant to this request, other than to name those offerors who have submitted proposals. All respondents are advised to review all sections of this Request and to follow instructions carefully as failure to make a complete submission as described elsewhere herein may result in rejection of the proposal.

## Contract Period

The term of any award resulting from this request shall be from approximately August 2006 through December of 2006.

## Compensation and Payment Terms

Compensation will be based upon the deliverables list according to the technical/cost proposal. The successful respondent will submit an invoice based on RIDEM approved deliverables.

## Performance Evaluation

Proposals must include a project plan including a statement of scope (both what is in-scope and any exceptions which the vendor proposes are out of scope), identification of all roles and responsibilities for the project, proposed staffing plan (with named individuals - see Supplemental Terms & Conditions paragraphs 44 - 50), key risks, a schedule, and detailed budget along with any other related documentation the vendor feels is relevant to the project plan. Project plans must include a deliverables based work breakdown structure identifying all top level deliverables, all work to be completed by vendor, and any work the vendor assumes the state will be completing.

Projects will be tracked in Microsoft Project. Monthly reports will be delivered on project activity, detailing timelines, labor hours on each task in a format mutually agreed upon RIDEM and the successful agency.

RIDEM will review and accept invoices for payment processing in a timely manner conditional upon satisfactory completion and acceptance of (1) all evaluation requirements and (2) complete, accurate submission of scheduled deliverables. Payment will be calculated based upon an earned value methodology as identified in the project plan, per the Supplemental Terms and Conditions - see paragraph 15 and 48.

## Completion and Acceptance Criteria

- Deliver a final release that is 100 % free from major bugs and meets 100% of the functional requirements. A major bug makes a major feature inoperable, and has no practical workaround.
- Execute the full system test plan in the production environment.
- Execute performance benchmark test for the system in the production environment.
- Deliver a release notes and known issues document for each phase of the project. Identify and document items that need to be part of DEM's maintenance and support plan for each phase.
- In house training complete.
- Deliver source code, executables, and scripts, which shall become the unrestricted property of the State of Rhode Island, Department of Environmental Management.

## Instructions for Proposal Content and Format:

***NOTE: TECHNICAL AND COST PROPOSAL documents will not be submitted separately but are to be combined into one complete submission; Proposal format will include:***  
***1) Technical Proposal information presented first based on elements described below***  
***2) Itemized Cost Proposal documentation.***

Consistent with the Scope of Work (SOW) described in this proposal the Technical Proposal content must include, at a minimum, the following information for RIDEM to review:

### **BACKGROUND AND PREVIOUS EXPERIENCE:**

- **A Completed and signed three-page RIVIP bidder certification cover form.** Form is downloadable from [www.purchasing.ri.gov](http://www.purchasing.ri.gov)
- **A Completed and signed W-9 Taxpayer Certification Form,** downloadable from [www.purchasing.ri.gov](http://www.purchasing.ri.gov)
- **Company Introduction:** Respondents are to include a complete description and other relevant information documenting organizational structure and the agency's expertise relative to the service requested.
- **Relevant Experience:** Respondents are to include a comprehensive listing of Nodes and water quality database exchanges that they have built. In addition, respondents should list similar projects and/or clients served similarly in concept to the project being proposed.
- **Existing Workload:** Respondents are to include a current listing of all projects contracted to perform and their capacity to add another project of this size within the timeline expressed.

### **ORGANIZATION AND STAFFING:**

- **Staff Qualifications:** Respondents are to include an overview of experienced personnel presently on staff, prior experience and/or qualification of key personnel to be assigned to the project. Staff assignments and concentration of effort for each staff member are to be addressed. Respondents must demonstrate that staff has acquired knowledge and a depth of experience in the proposed technologies. Respondents must have experience with and completed at least one Trading Partner Agreement and Flow Control Document with EPA's Central Data Exchange and successfully completed those flows of data.

- **Sub-Consultants:** As applicable, disclosure of any sub-consultant agencies' organizational structure and business background as well as the type of work they will perform must be documented in response to this RFP. Full disclosure of the proposed team to be assigned to this project is required in the Technical Proposal.

**PROJECT WORK PLAN:**

- **Project Approach:** Respondents are to provide a detailed technical synopsis of their proposed services based on the SOW requested by RIDEM, including any technical or personnel issues that will or may be confronted at each stage of the project. Alternative approaches and/or methodologies to accomplish the intended results of this procurement will be considered. The ideal candidate will have already built and implemented a water quality database and Node for a business model similar to Rhode Island. The RIDEM is anticipating evaluation of alternative approaches such as modifying an existing water quality database and/or schema from another State to keep the cost of new development and troubleshooting to a minimum and increase the number of enhancements that can be provided in the proposal. However, proposals that depart from or materially alter the terms, requirements or SOW as defined by this RFP will be rejected and considered non-responsive.
- **Work Plan:** Proposals must include a project plan including a statement of scope (both what is in-scope and any exceptions which the vendor proposes are out of scope), identification of all roles and responsibilities for the project, proposed staffing plan (with named individuals - see Supplemental Terms & Conditions paragraphs 44 - 50), key risks, a schedule, and detailed budget along with any other related documentation the vendor feels is relevant to the project plan. Project plans must include a deliverables based work breakdown structure identifying all top level deliverables, all work to be completed by vendor, and any work the vendor assumes the state will be completing.
- **Project Manager:** Vendor must provide a project manager to serve as the main interface with the RI DEM Exchange Network Node project manager. The project manager must have experience with projects that are comparable in size and scope.
- **Reporting Requirements:** Any reports generated will be submitted both in hard copy and electronically for ease of review. The successful respondent will be prepared to discuss findings in a coordinated team meeting environment should this be required.

- **Supplemental Information:** Respondents are encouraged to submit any other information deemed useful to provide RIDEM with sufficient relevant information to evaluate the consultant's qualifications and approach to the project.

### Proposed Solution

- **Solution Functionality:** Proposals must include a description of the capabilities provided by their proposed solution, including those items which are out of the box, configurable, or require customization mapped to the requirements identified in this RFP.
- **Architecture:** Proposals must include a description of the solution architecture, including hardware and software requirements, primary application languages, database, application interfaces, code structure (i.e. identification of primary classes, structure of interface logic vs. business logic, etc), and deployment architecture.
- **System documentation:** A description of the system documentation to be delivered with the completed project must be included.
- **Security Architecture:** A description of how security will be maintained within the system.
- **Total Cost of Ownership:** A description of the support and maintenance procedures and assumed costs, including hardware and software maintenance, operational staffing and system administration.

### COST PROPOSAL

The cost proposal will reflect completion of the project, itemized by task, or assets (hardware or software) to be procured. Each task will correspond to a deliverable identified in the work plan provided by the vendor as part of the proposal package. The cost proposal may include additional services that the contractor believes will benefit the Department and the overall final product. However, the total cost of the project may not exceed the specified amount of \$250,000.

- Cost proposal prices submitted will be considered **firm and fixed**.
- Cost proposal must include hourly rates
- Funding available for this project is \$250,000.

Note: Failure to fully disclose annual costs could result in disqualification.

EMAILED QUESTIONS :

E-mailed questions may be submitted in accordance with the terms described on page 1 of this solicitation.

Questions received, if any, will be posted on the internet as an addendum to this solicitation. It is the responsibility of all interested parties to download this information.

SUBMISSION REQUIREMENTS AND DUE DATE see page 1

All document pages are to be numbered in consecutive order.

Combined TECHNICAL/COST PROPOSAL ("original" plus seven (7) copies) submissions are to be either mailed or hand-delivered in a sealed envelope marked "RFP #B06428: NEIEN Node and Water Quality Information System" by the date and time listed on page 1 of this solicitation.

RI Dept of Administration  
Division of Purchases, 2<sup>nd</sup> Floor  
One Capitol Hill  
Providence, RI 02908-5855

~~NOTE: Proposals misdirected to other State locations or which are otherwise not presented in the Division of Purchases by the scheduled due date and time will be determined to be late and may not be considered. Proposals faxed or emailed to the Division of Purchases will not be accepted. The "official" time clock is located in the Division of Purchases Reception area.~~

## EVALUATION AND SELECTION

The State will establish a Technical Review Committee that will evaluate and score combined Technical/Cost proposals received utilizing the following criteria resulting in a final ranking and recommendations selection:

### SELECTION CRITERIA:

1. (20 Points) - Vendor Capacity, Capability and Qualifications. Experience with Node development, implementation and Water Quality Database design.
2. (20 Points) - Solution functionality - depth and breadth of solution capability, degree of configurability (i.e. flexibility in configuration)
3. (20 Points) - Solution architecture - Scalability, reliability, recoverability, flexibility of proposed solution architecture. Deployment configuration consistent with state standards.
4. (20 Points) - Quality of project workplan.
5. (10 Points) - Security solution which best meets the needs and conforms to the State of RI security architecture and federal CROMERR standards.
6. (10 Points) - Proposed project length and start date.

Upon final selection approval, all respondents will be notified by the State, via a posting on the Division of Purchases website, that a final selection has been made.

Notwithstanding the above, the State reserves the right to accept or reject any or all options, bids, proposals, to award on the basis of cost alone, and to act in its best interest.

At any point during the review process, any proposal found to be substantially non-responsive will be dropped from further consideration.

The State may, at its sole option, elect to require presentation(s) by respondents clearly in consideration for award. Other submissions, certifications, or affirmations may be required, as appropriate.

The State reserves the right to make an award or multiple awards or to reject any or all proposals based on what it considers to be in its best interest.

## SCOPE OF WORK

### Existing Hardware

The contractor must work within the existing hardware requirements at the State of RI. Web interfaces will be designed for thin client access.

### Network

TCP/IP Ethernet LAN. Access to agency WAN is through T1 connection. Network operating system is Windows 2000/2003.

### Software and Environment Standards

The system will use a relational database server as the database solution and ESRI Software for GIS and mapping. The contractor is required to provide a Technical Architecture Recommendation for the presentation and application layers as described in the contract documents. Vendor must be cognizant to the most recent functional standards of Nodes and the Exchange Network. It is desirable that the vendor have experience with existing data flows of FRS data as well as the Water Quality Exchange. The database will be designed using the ESAR standard (see attached).

### Technical Requirements

#### 1. Establish a Node Configuration

The State of Rhode Island currently does not have a Node. The Information Technology Division is very particular about breaching security. Location of the server and ensuring its security are vitally important to the State.

#### Deliverables:

- Recommend hardware and software configuration after evaluating RI standards and security structure. The vendor is expected to have experience in implementing Nodes with various technologies including Asp.Net and C#, SQL Server 2000, and Windows Server 2000 as well as other solutions that may be better suited for the application. This knowledge base is critical to provide a recommendation of hardware and software to best meet the needs of RI's current and future data exchanges yet be maintainable by our existing support staff.
- Set up and Install the Node on the National Environmental Information Exchange Network built in accordance to the RIDEM and State of RI security guidelines.
- Trading Partner Agreements and Flow Control Documents for the FRS and WQX flow. The vendor is expected to have experience with these documents.

- Scripts/software to convert the state database data to the format required for the Exchange Network.
- Software package which implements all the methods to provide a web service on the node as specified in the Exchange Network functional spec located at <http://www.exchangenetwork.net>
- A web based administrative interface to manage logs, security, scheduling and notifications to keep maintenance of the system to a minimum.
- The vendor will conduct testing and troubleshooting of the node and supporting applications that prepare the data for transmission. All methods of the web service must be tested. Successful tests will include bidirectional data transfers (data sent to and from the web service). All XML data will be validated with the appropriate schemas, and the data will be checked against the originating database.
- A document defining maintenance, security plan and disaster recovery.

## 2. Clean FRS data and exchange through the Node

The facility data resides in the Permitting, Licensing, and Other Vital Environmental Records (PLOVER) database. This system was built to streamline permit information. The system has not yet been completed; however major table changes at this time are not expected. The system was built based on state/EPA Facility Identification Template Standard (FITS2). The system is currently housed in ORACLE.

Deliverables:

- Evaluation of the integrity of Facility information housed in the RI database versus Facility information housed in FRS. Develop a plan to identify which database has the "correct" version of Facility data and resolve existing data conflicts. This plan may include a methodology to clean and reconcile facility data between the two systems including SQL queries, reports or data imports to provide a data view that staff can use to verify and edit content in an efficient manner.
- Map the FRS data from the RI database to the format required for the FRS data flow. This may include identifying configuration changes to tables in the PLOVER system. RIDEM MIS staff will make any necessary changes to this database.
- Support to RI during this first flow of Node data.

## 3. Develop a Water Quality Database Application

There are 2 existing water quality databases within the Department of Environmental Management. EQUS is used by the Office of Waste Management and WQUAL is used by the Office of Water Resources. WQUAL is housed in MS Access 97 and is used by the water quality assessment group (305b) and the shell fishing group to administer the FDA shellfishing program. The MS Access database does not meet ESAR standards.

The new system must meet EPA requirements for 303 Assessment and interfacing with EPA STORET through Central Data Exchange (National Environmental Information Exchange Network) implementation. The System must support EPA environmental data standards (example - Environmental Data Standards Council/EDSC, CROMERRR, and ESAR). The system must support agency and national geospatial data standards, and be compatible with GIS needs. System compatibility (data import from) with Laboratory Information Management System (LIMS) is essential.

Of primary concern is the identification of a contractor who is qualified to build from scratch a database and software application that will at a minimum provide all of the current services to staff that the WQUAL provides, and must ensure the surface water quality monitoring information system meets growing demands. This project will consolidate and modernize the input, validation, analysis and reporting of information and should result in considerable time savings to staff. The goal is to provide a replacement information system, consisting of a database and software application, for long term storage and management of ambient surface water quality monitoring data.

#### Deliverables:

- A water quality database structured to incorporate Environmental Sampling, Analysis and Results Data Standards (ESAR) (see attached).
- Migrate existing data from WQUAL (Access Database) into the new water quality database.
- Provide web based interfaces for data entry, reporting and analysis.
- The system must be capable of electronic uploads of data in various formats(XML, Excel, Text, CSV etc. ) from outside agencies.
- Uploaded data must be validated by the application according to rules specified by RI DEM.
- The system must be able to track quality assurance information as well as the source of the data.
- Meet EPA Requirements for 305(b) assessments and EPA CROMERRR security standards.
- Reproduce reports that are existing in the WQUAL System. Specifically, calculations made for shellfishing quality analysis and 305(b) reporting criteria.
- Map the Water Quality data elements to the corresponding elements in the Exchange Schema.
- Flow water quality data for projects with Quality Assurance Protection Plans (QAPPs) to EPA STORET via the node by November 2006.
- Flow selected Department of Health LIMS data to EPA via the node by December 2006.
- Security architecture must be built to provide login and role based access. Unauthorized access must be prevented using standard security practices in software design. Provide documentation describing this

architecture. Ensure that the system meets CROMERRR standards (see website: <http://www.epa.gov/cdx/cromerrr/index.html>).

- Vendor will complete additional analysis on Water Quality Database and deliverables.

Optional Deliverables: These are the objectives that are not required but desired if there is enough money. These objectives fall under the assessment of enhancements and will be evaluated separately.

- The Office of Waste Management has a software license for EQulS. The Office of Water would like to have the ability to view and report on the EQulS data in the database. If possible, the Office of Water would like to be able to upload some of the EquIS data into STORET.
- The Office of Water Resources manages buoys in Narragansett Bay. The buoy information is available via phone line and is downloaded through the Ecowatch software and placed into a comma delimited text file. It is loaded into excel and is manipulated with macros. The data needs an efficient process so that it can be imported into the water quality database and uploaded to STORET.
- The RI DEM website currently presents static data only. We desire to present up to date water quality data dynamically in a secure and efficient environment to interested parties over the internet. A presentation of the various options, including server security, hardware, web server options and application server options is desired.
- The TMDL program has completed about 10 TMDL's for the state. The data for these TMDL's are housed in various spreadsheets. An enhancement to this project would be to import all of the TMDL data into the new water quality database.
- SharePoint Integration - RIDEM has made a commitment to Microsoft SharePoint. A desired enhancement to the system would be to use the database behind Microsoft SharePoint to replace the BLOB entity in the water quality database. With this integration, the TMDL user can create, read, update and delete QAPP's, photos and other BLOB's in SharePoint. When the water quality database is ready to send data to STORET, it can call for the BLOB's housed in SharePoint and upload them via XML to the CDX.
- Volunteer Monitoring Program - Provide a web based interface for external partners to upload validated data to the water quality database.

## In Scope

- The Node Server configuration supports environmental data exchanges between local, state and federal partners.

- The Node Server configuration will support data exchanges developed with guidance documents by the NEIEN Technical Resource Group (TRG).
- A data flow of facility data and water quality data will be exchanged between the Node and the EPA. No other data flows on the Network Exchange will be established under this project.
- RI Department of Health LIMS water quality data will be uploaded through the RI Node to the STORET Data Warehouse.
- Our 305(b) and 303 (d) and current water quality databases (all in MS Access) share a common "BASIN" table that contains characteristics of waterbody ID's. Because these characteristics and identifiers are shared, reporting for 305(b) assessment and 303(d) listing is streamlined. The new water quality database must at least have the functionality to maintain the connections to the 305(b) and 303(d) database and provide at least the same level of streamlining. Rhode Island is expecting our waterbody ID's to be referenced to the USGS National Hydrography Dataset (NHD) at a 1:24,000 scale by July 2006. The new water quality database must have the capability to incorporate the identifiers used in the NHD so that stations are identified by river or waterbody location as well as latitude and longitude.
- A water quality database developed to house surface water quality data, wet weather water quality data, data logger information, and salt water data.
- Develop predefined formats and automated procedures that will allow data collected by RIDEM, and other parties contracted by RIDEM to be submitted to the RIDEM and incorporated into the new water quality database.
- Historical monitoring data will be uploaded to STORET if a QAPP exists for the data set. Researching the metadata if no QAPP is available is out of the scope of this project.
- Data collectors whose results conform to fit predefined templates will be uploaded to STORET via the Node. Collectors that do not report in the template format to RIDEM will not be uploaded. They will be responsible for their system modifications and data modifications to initiate an upload.
- Legacy data will be converted and stored in new water quality database.
- Set up and install the environment.
- Gather and document requirements, design, build test and deploy the system to meet requirements.

- A test plan will be provided and executed as each part of this project is completed. The vendor will implement the plan for the node and supporting applications that prepare the data for transmission. All methods of the web service must be tested. Successful tests will include bidirectional data transfers (data sent to and from the web service). All XML data will be validated with the appropriate schemas, and the data will be checked against the originating database
- Project management - including plan development, issue tracking, status reporting, risk management, etc.
- The vendor will provide training so RI staff will be able to maintain the system. The training will include a user/administrator manual as well as a more detailed programmer/DBA manual.

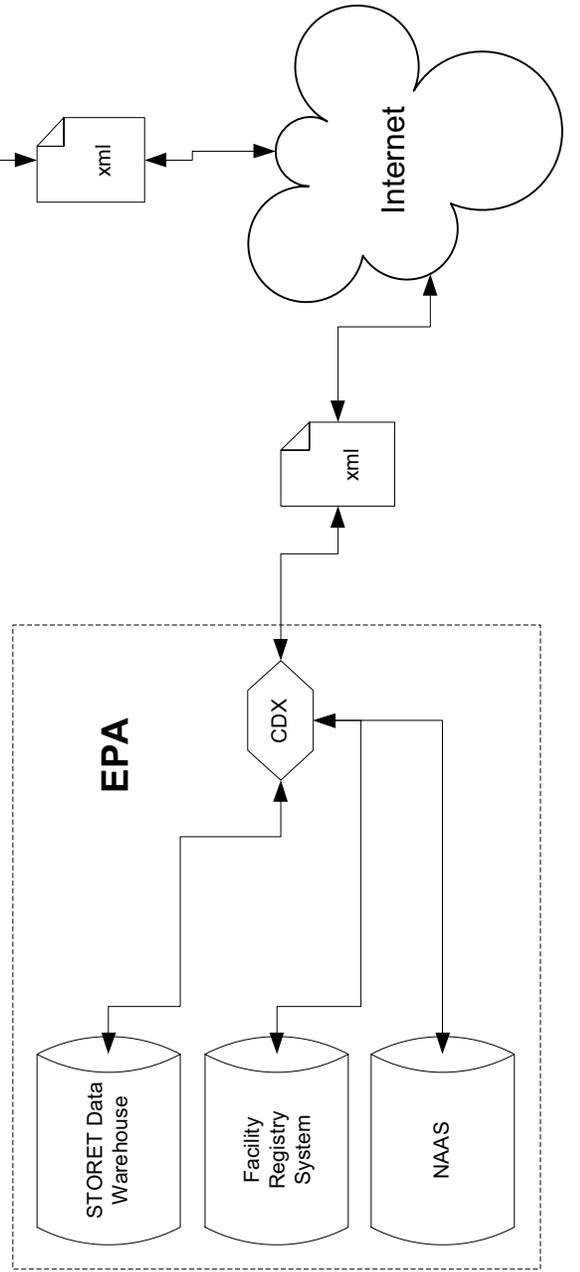
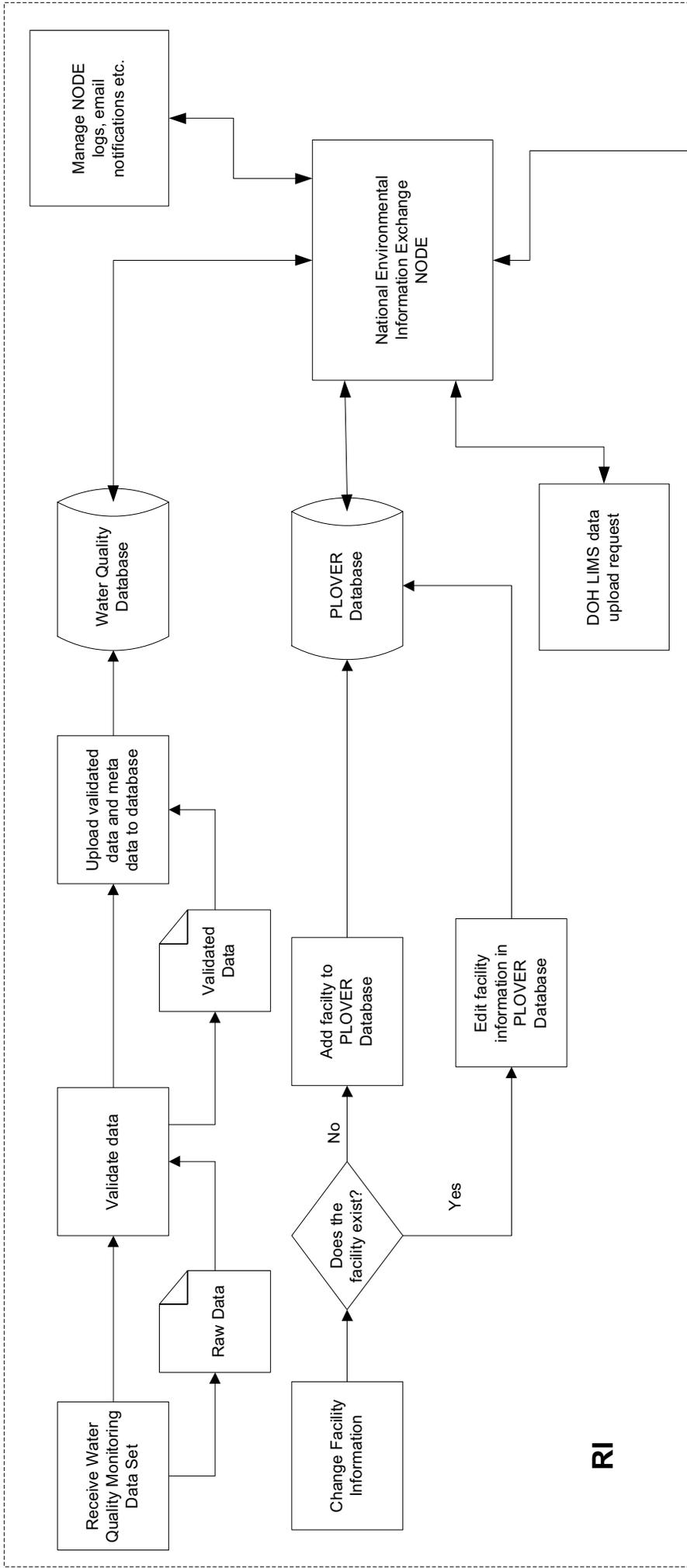
## Out of Scope

- This Node project will not support non-EPA data exchanges.
- Other existing data flows supported by the EPA will not be developed in the scope of this project.
- Water quality data uploads that do not conform to the defined water quality exchange data structure will not be supported by the Node.
- No other web systems or data collection applications will be accommodated by this hardware.

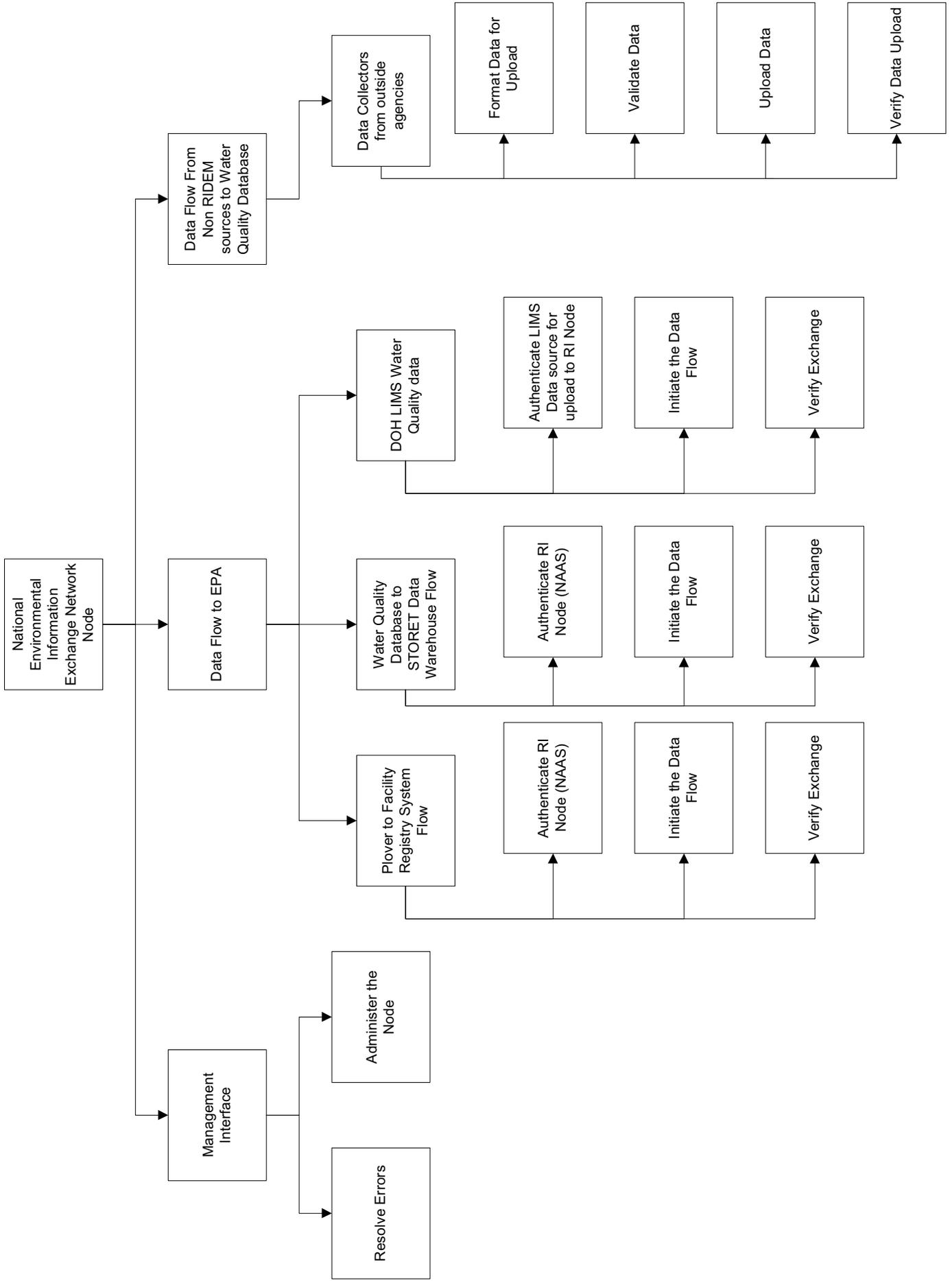
## PROPOSED PROJECT TIMELINE

Contractor Start	August 15,2006
Review and revise Project Plan	
A written report of agency technical requirements.	
Node Technical Architecture confirmed.	
Order and Install Node hardware and software	
Node installed and successful network ping.	
Trading Partner Agreement (TPA) with EPA Signed – FRS	
Trading Partner Agreement (TPA) with EPA Signed – LIMMS	
Water Quality database design document completed and approved by RIDEM including LIMMS data standards and exchange protocols	
Trading Partner Agreement (TPA) with EPA Signed – STORET	
Establish connections with Office of Waste Management water quality database	
Water Quality database engine, data entry forms,	

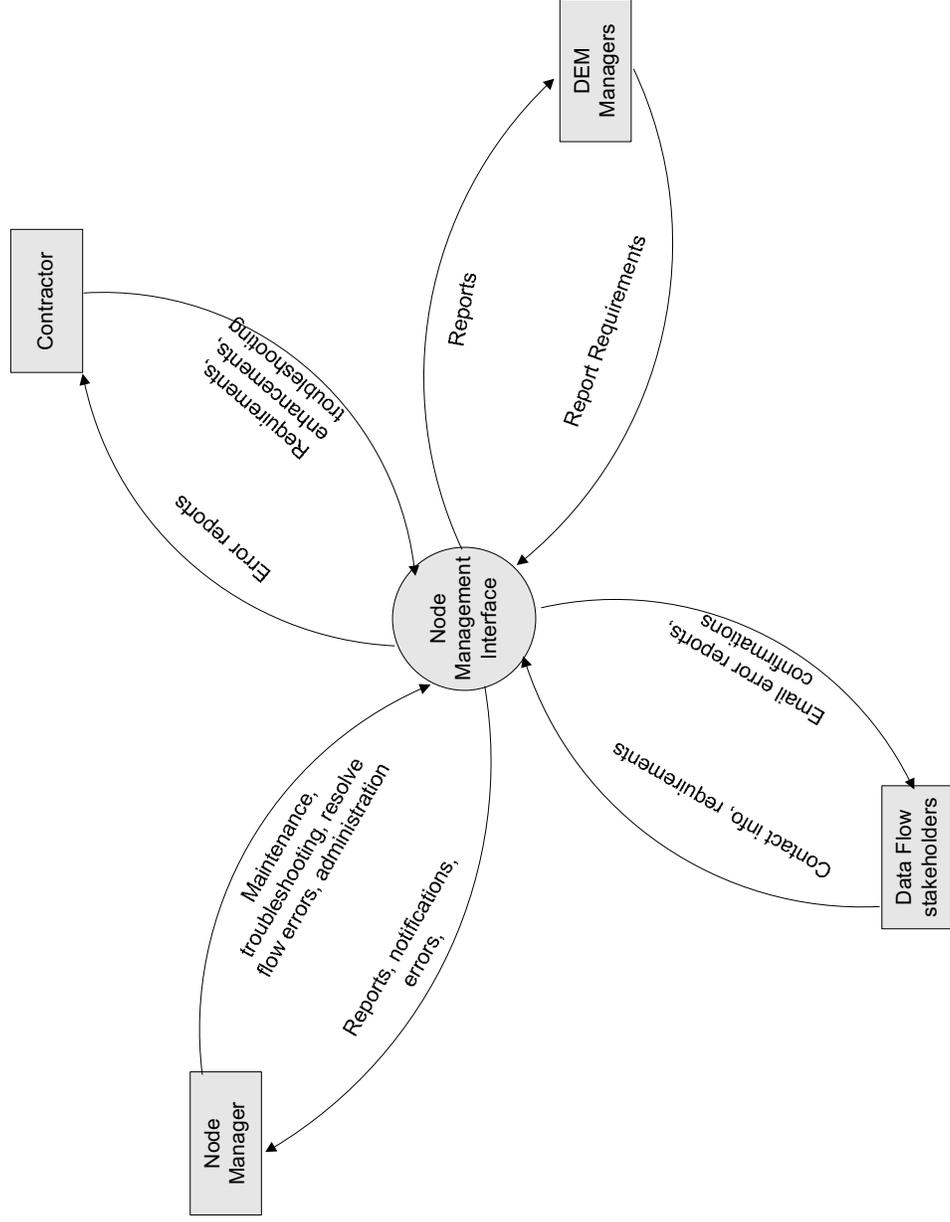
reports, and queries completed	
PLOVER Facility clean-up	
A subset of RIDEM Water Quality data entered into new system tested and ready for exchange	10/15/2006
RIDEM Water Quality Database xml exchange with EPA STORET tested and completed	11/30/2006
FRS Data exchange	9/15/2006
RI DOH LIMMS data xml exchange with EPA and DEM tested and completed	12/30/2006
Training and Technology Transfer	1/30/2007



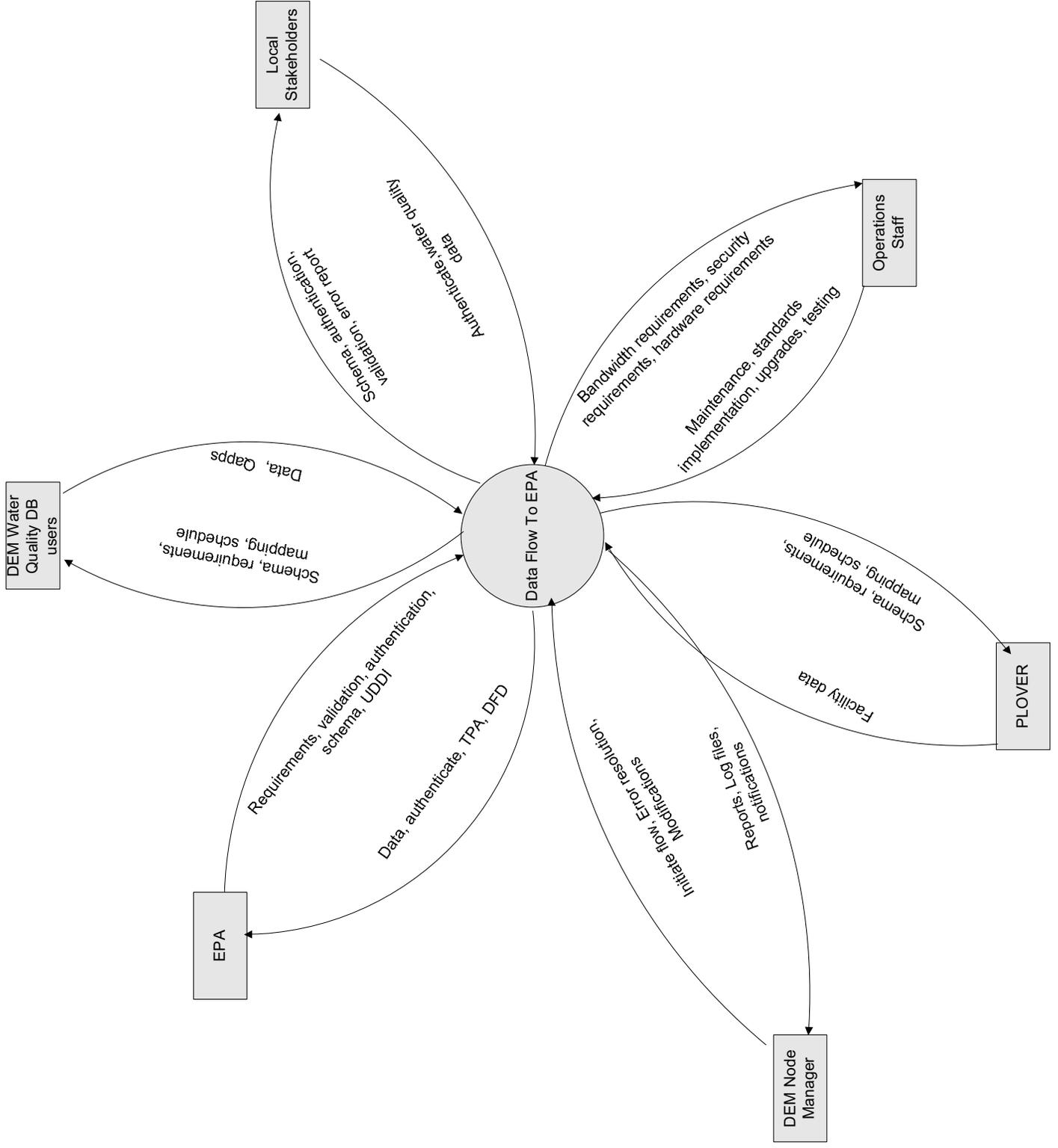
# NEIEN Node Business Process Scope



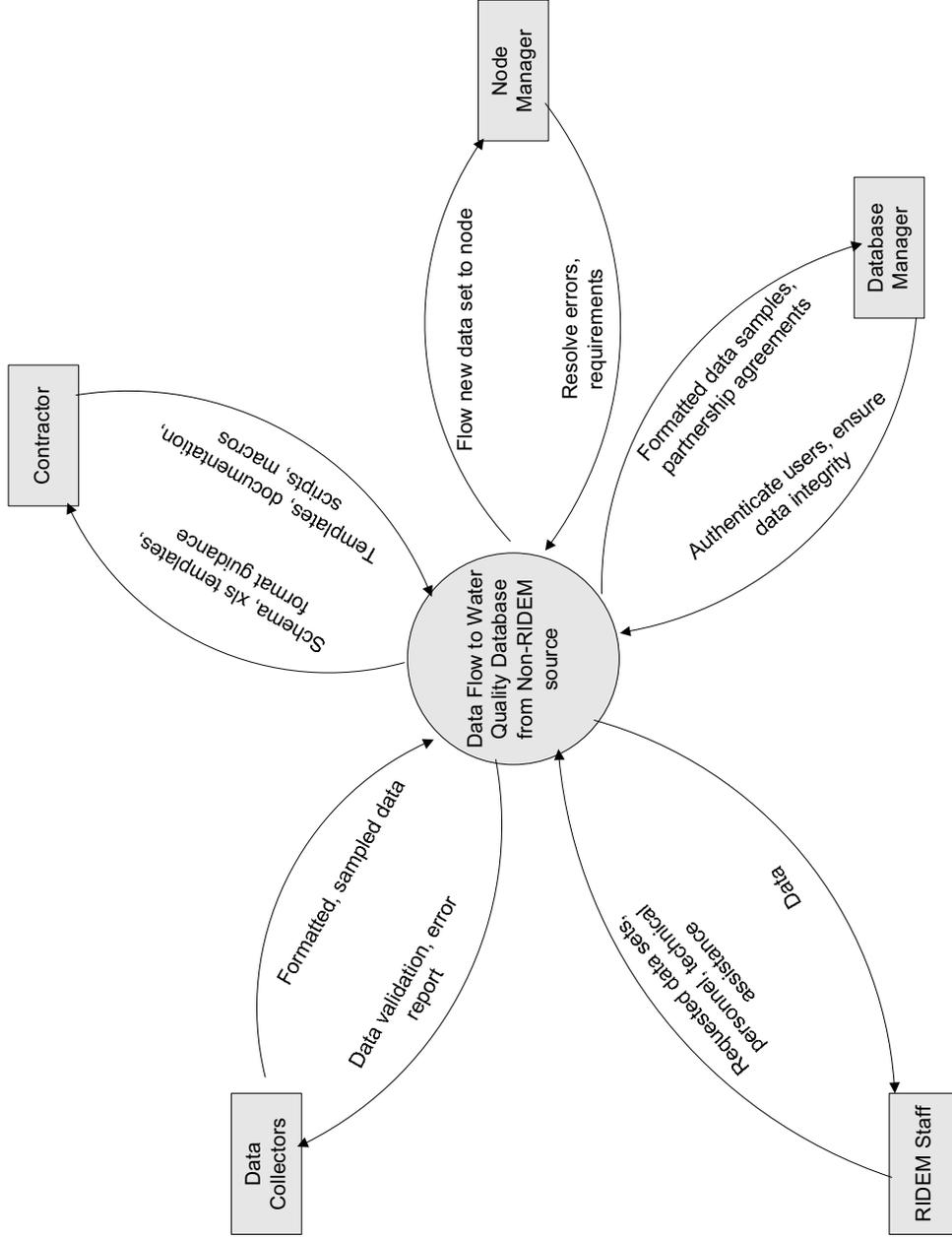
# Context Flow - Management Interface



# Context Flow - EPA Data Flow



Context Flow -  
WQ data from  
Non-RIDEM  
source



# **Environmental Sampling, Analysis and Results Data Standards Overview of Component Data Standards**

Standard No.: 1-XXX  
Version 1- **FINAL DRAFT**

**July 26, 2005**

**This standard has been produced through the  
Environmental Data Standards Council (EDSC).**

The Environmental Data Standards Council (EDSC) is a partnership among EPA, States and Tribal partners to develop and agree upon data standards for environmental information collection and exchange. More information about the EDSC is available at <http://www.envdatastandards.net>.

## Foreword

The Environmental Data Standards Council (EDSC) identifies, prioritizes and pursues the creation of data standards for those areas where information exchange standards will provide the most value in achieving environmental results. The EDSC involves Tribes and Tribal Nations, state and federal agencies in the development of the standards and then provides the draft materials for general review. Business groups, non-governmental organizations, and other interested parties may then provide input and comment for Council consideration and standard finalization. Draft and final standards are available at <http://www.envdatastandards.net>.

## 1.0 INTRODUCTION

The development of a Laboratory Results Data Standard was commissioned by the EDSC in January 2003. The EDSC agreed that development of a data standard to enable the sharing and integration of laboratory results data was critical for emergency response, public health assessment, environmental effects and trends analyses. A multidisciplinary team developed the draft standard. As the standard evolved it was decided that in order to adequately exchange the information the standard should follow the business processes of sampling, analysis and results. As a result, the name was changed from Laboratory Results Data Standard to the Environmental Sampling, Analysis and Results Data Standard (ESAR). ESAR completed a technical review in February 2004. Media specific reviews in water, waste and air followed in 2004 through the spring of 2005. These reviews resulted in the development of nine supporting standards; a more generic renaming of titles for the standards and names for the data elements; and division of the primary standard into four separate component data standards: 1) ESAR Project Data Standard, 2) ESAR Monitoring Location Data Standard, 3) ESAR Field Activity Data Standard, and 4) ESAR Analysis and Results Data Standard. The EDSC envisions that this approach of using small flexible component parts will enable developers to pick and chose those elements needed and make implementation easier. The EDSC approved the suite of ESAR Draft Data Standards for public review in July of 2005.

The ESAR Draft Data Standards follow the business processes used to collect, analyze and report environmental data. The standards are meant to encompass the foundation or base amount of material needed to exchange environmental sampling, analysis, and results data. If additional data elements are required, they can be added to the standardized base. Conversely, if data elements or data groupings contained in the base are not required, they do not have to be used. The ESAR standards are designed in flexible small components that can be arranged, rearranged, used and reused as needed.

### 1.1 Scope

This overview describes the primary and supporting data standards that may be used in the exchange of environmental sampling, analysis and results data. It explains how the components can be combined and reused.

### 1.2 Component and Referenced Data Standards

The ESAR Draft Data Standards is a suite of supporting component standards that are based on the business processes used by collectors of environmental data for project planning, sample collection or monitoring, analysis, and reporting results. The suite is comprised of four primary standards and nine supporting components:

## Primary Data Standards

- **Project** – An environmental data collection effort that has a stated purpose and puts a series of samples/results into a meaningful context. The project section provides information about the identification, contacts, dates, study areas, reasons, and quality constraints. The level of information provided for a project will be determined by parties that have to collect and manage the data.
- **Monitoring Location** – An identifiable location where an environmental sample, onsite measurement, and/or observation is determined. The monitoring location section provides information about the identification, the contacts, dates, study areas, reasons, and quality constraints. There may be many monitoring locations that are utilized by a project. It is also possible that a monitoring location is not associated with any project. A monitoring location could have many field activities occurring at it over time.
- **Field Activity** – Field monitoring activities, include the collection of a physical sample, measurement, and/or observation where one or more of the results will be described or quantified. The field activity section provides information about the contacts, collection method, sample identification, collection times, depth/altitude, observation notes, sample characteristics, and batch and shipping activities. There may be many field activities at a monitoring location. A field activity may be categorized as sample collection, which may have many results produced from an original collection.
- **Analysis and Results** – The Analysis and Results Data Standard defines the elements required for describing analysis and results information. It provides information about the laboratory, laboratory batch receipt, laboratory sample receipt, sample preparation, laboratory analysis, and quality control data.

## Supporting Data Standards

- **Attached Binary Object Data Standard** -- Describes digital items (e.g., pictures, documents) that are attached to the transmitted data.
- **Bibliographic Reference Data Standard** – Library cataloging descriptors for identifying material referenced in the data transmission (e.g., reference for a published report). Adopted from the international standard.
- **Compositing Data Standard** – Describes the combining of several sample results or units to produce a single entity.
- **Equipment Data Standard** – Describes equipment or instruments used in the field or laboratory and activities associated with calibration information.
- **Measure Data Standard** – Identifies the values and the associated units of measure for measuring/recording the observation or analytical result value.
- **Method Data Standard** – Identifies the procedures/processes used or references standard methodologies used to obtain the result.
- **Quality Assurance and Quality Control** – Identifies quantitative statistics and qualitative descriptors that are used to interpret the degree of acceptability or utility of data acquired during field or laboratory analysis.
- **Representation of Date and Time Data Standard** – This standard indicates a particular day within the Gregorian calendar month and specifies an instance of time in the day. It adds Coordinated Universal Time (UTC) data elements to the existing EDSC Date data standard and is adopted from an international standard.
- **Sample Handling Data Standard** – Specifies the standard characteristics associated with sample preservation and treatment in the laboratory and/or in the field.

Other EDSC data standards may need to be used in support of ESAR suite of data standards. The ESAR standards provide notations to reference specific standards where they may be needed. These standards include:

- Biological Taxonomy [1-9937-2] Data Standard
- Chemical Identification [Version 2 Draft] Data Standard
- Contact Information [1-88433-2] Data Standard
- Facility Site Identification [1-9936-2] Data Standard
- Latitude/Longitude [Version 2 Draft] Data Standard

### 1.3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply:

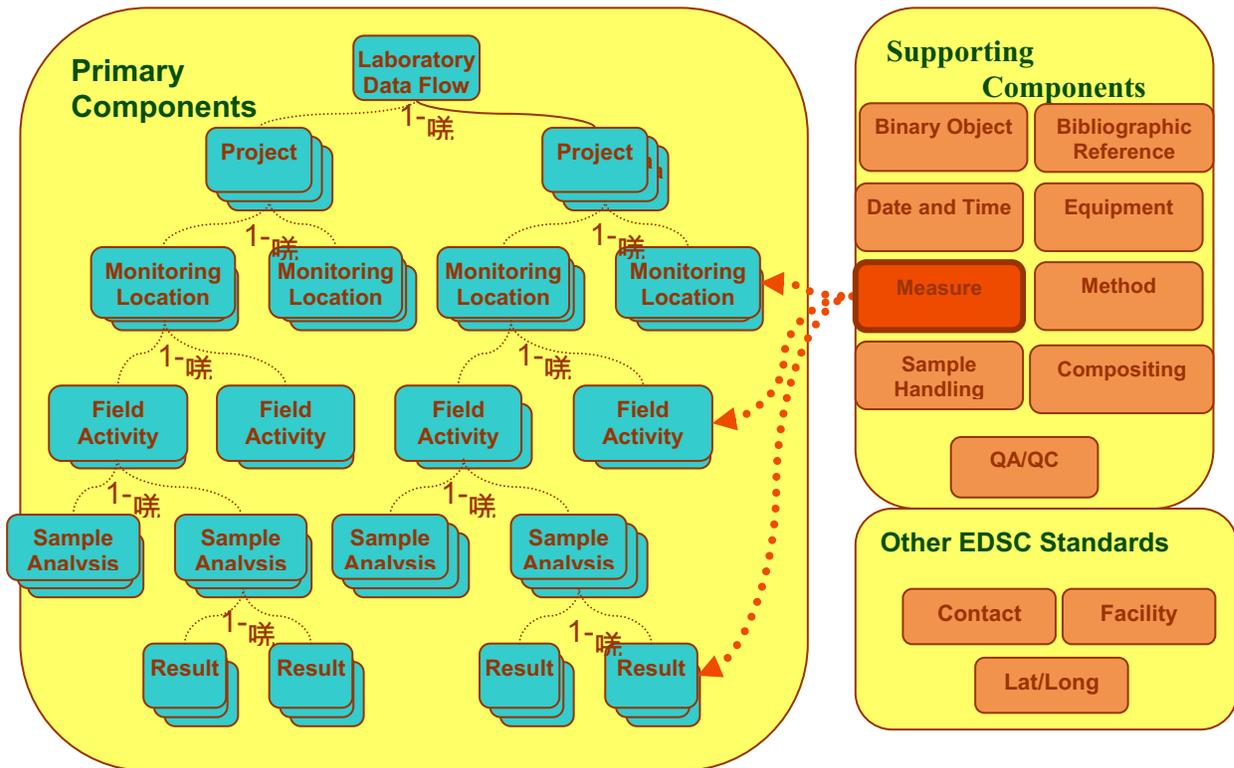
<b><u>Term</u></b>	<b><u>Definition</u></b>
<b>Field Activity</b>	Field monitoring activities, including the collection of a physical sample, measurement, and/or observation where one or more of the results is described or quantified.
<b>Laboratory</b>	A fixed lab, mobile or field facility equipped for testing and analysis.
<b>Laboratory Analysis</b>	Analytical results that are generated either in the field from continuous or discrete observation /monitoring or from mobile or fixed laboratory facilities.
<b>Project</b>	An environmental data collection effort that has a stated purpose and puts a series of samples/results into a meaningful context.
<b>Monitoring Location</b>	An identifiable location where an environmental sample, onsite measurement, and/or observation is determined.

### 1.4 Implementation

Each component standard consists of data elements and, where appropriate, groupings of data elements. The primary components describe the four major business processes and the supporting components are activities or information used multiple times within the primary components. For example:

- Many projects may be included in a set of exchanged data.
- Many monitoring locations maybe utilized by a project or monitoring locations may not have a project association.
- Many field activities may occur at a monitoring location.
- Many sample analyses may be performed during a field activity.
- Measurements can be taken at the monitoring location, in the field, in the laboratory, or in the reporting of results. In each instance, the Measure Data Standard would be used.

The Modular and reuse concepts are illustrated in Figure 1.



**Figure 1: Relationship between ESAR Component Data Standards**

**1.5 Document Structure**

The structure of this document is briefly described below:

- a. Section 2.0 ESAR Primary Data Standards, illustrates the principal data groupings contained within this standard.
- b. Section 3.0 ESAR Primary Data Standard Table, provides information on the high level, intermediate and elemental Measure data groupings. Where applicable, for each level of this data standard a definition, XML tag, note(s), example list of values and format are provided. The format column may include the required number of characters for the associated data element, where “A” specifies alphanumeric and “N” designates numeric.
- c. Section 4.0 ESAR Supporting Data Standards, illustrates the principal data groupings contained in the ESAR Supporting Data Standards.
- d. Data Standard Numbering: For purposes of clarity and to enhance understanding of data standard hierarchy and relationships, each data group is numerically classified from the primary to the elemental level.
- e. Code Metadata: Based on the business need, additional metadata may be required to sufficiently describe a code. A note regarding this additional metadata is included in the notes column for code elements. Additional metadata for codes may include:
  - Code List Identifier, which is a standardized reference to the context or source of the set of codes
  - Code List Version Identifier, which identifies the particular version of the set of codes.
  - Code List Version Agency Identifier, which identifies the agency responsible for maintaining the set of codes
  - Code List Name, which describes the corresponding name for which the code represents

## 2.0 ESAR PRIMARY DATA STANDARDS

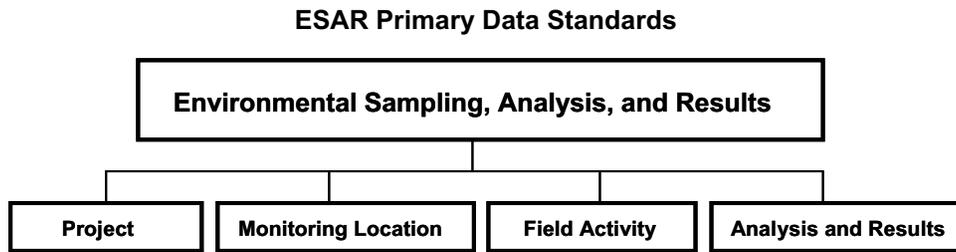


Figure 2 – Structure of ESAR Primary Data Standards

### 3.0 - ESAR Primary Data Standards and Data Groupings Table 1.

Environmental Sampling, Analysis and Results Primary Data Standards
<p><b>1. ESAR Project - Data Standard</b></p> <p><i>Definition:</i> ESAR environmental data collection effort that has a stated purpose and puts a series of samples/results into a meaningful context.</p> <p>The following data groups may be used to specify the ESAR Project:</p> <ul style="list-style-type: none"> <li>Project Point of Contact,</li> <li>Project Identification,</li> <li>Project Duration,</li> <li>Project Reason,</li> <li>Project Data Collection Area,</li> <li>Project Collection Facility Site Identification,</li> <li>Data Collection Quality,</li> <li>Project Reference,</li> <li>Attached Binary Object,</li> <li>Bibliographic Reference.</li> </ul>
<p><b>2. ESAR Monitoring Location - Data Standard</b></p> <p><i>Definition:</i> An ESAR identifiable location where an environmental sample, onsite measurement, and/or observation is determined</p> <p>The following data groups may be used to specify the ESAR Monitoring Location:</p> <ul style="list-style-type: none"> <li>Monitoring Location Point of Contact,</li> <li>Monitoring Location Identification,</li> <li>Geographic Monitoring Location,</li> <li>Monitoring Location Attached Binary Object,</li> <li>Monitoring Location Influences,</li> <li>Air Emission Release Point Identification,</li> <li>Air Open Path Monitoring Location,</li> <li>Well Identification.</li> </ul>
<p><b>3. ESAR Field Activity - Data Standard</b></p> <p><i>Definition:</i> ESAR field monitoring activities, including the collection of a physical sample, measurement, and/or observation where one or more of the results is described or quantified.</p> <p>The following data groups may be used to specify the ESAR Field Activity:</p> <ul style="list-style-type: none"> <li>Field Activity Point of Contact,</li> </ul>

Field Activity Identification,  
 Field Activity Date and Time,  
 Field Activity Equipment,  
 Field Activity Observation,  
 Field Activity Attached Binary Object,  
 Sample Collection Description,  
 Sample Event Depth/Height,  
 Field Sample Collection Method,  
 Field Sample Handling,  
 Sample Batch and Shipping,  
 Sample Chain of Custody.

**4. ESAR Analysis and Results - Data Standard**

*Definition:* ESAR Analysis and Results information for a sample about the laboratory, laboratory batch receipt, laboratory sample receipt, the sample preparation, the laboratory analysis, and the quality control data.

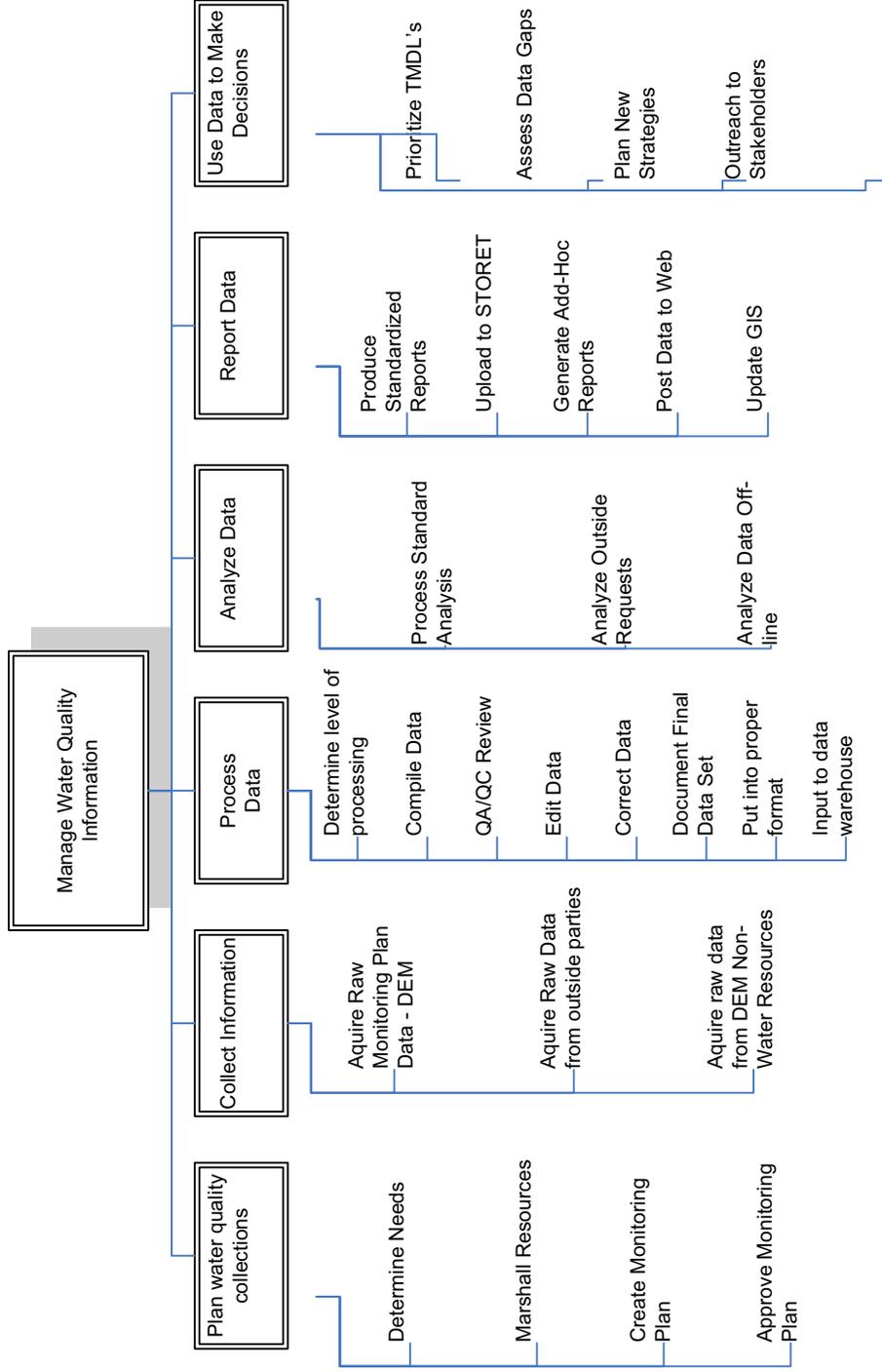
The following data groupings may be used to specify the ESAR Data Analysis and Results:

Laboratory Identification,  
 Laboratory Batch Receipt,  
 Laboratory Sample Receipt,  
 Laboratory Sample Handling,  
 Sample Preparation,  
 Analysis Information,  
 Substance Identification,  
 Analysis Results Identification,  
 QA/QC,  
 Analysis Results Attached Binary Object.

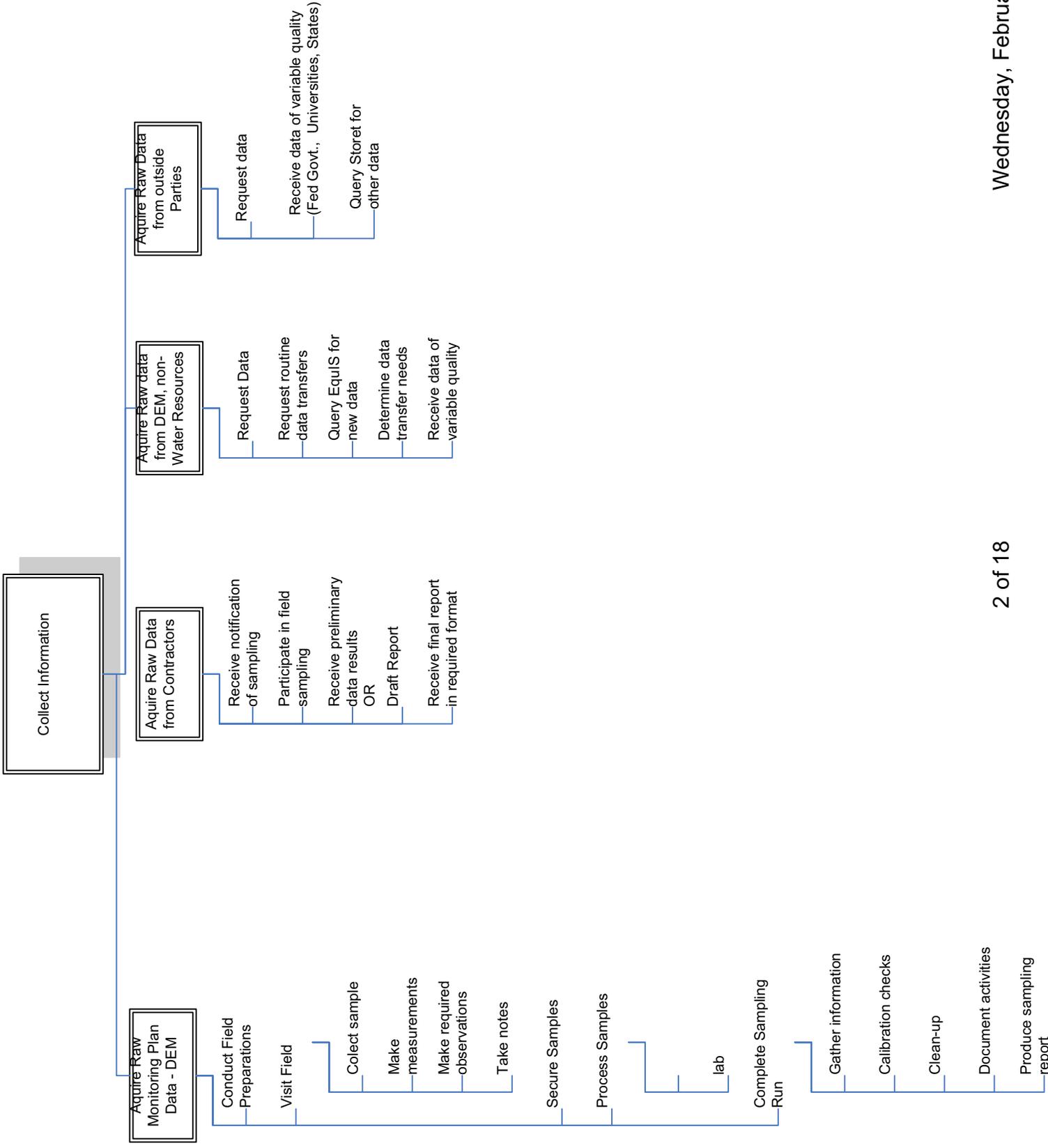
**4.0 – ESAR Supporting Data Standards and Data Groupings Table 2**

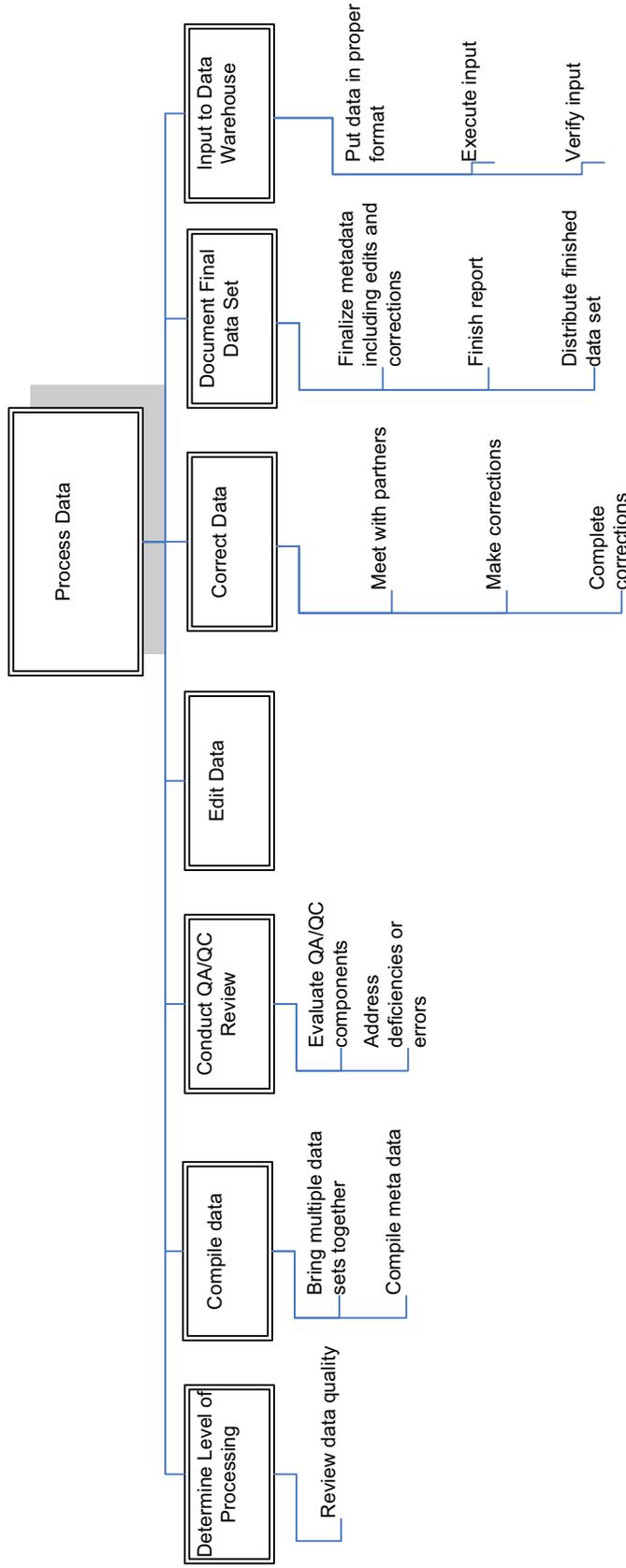
Environmental Sampling, Analysis and Results Supporting Data Standards
<p><b>1. Attached Binary Object</b></p> <p><i>Definition:</i> Reference documents, images, photos, GIS data layers, laboratory materials and other electronic objects attached within the data exchange, as well as information used to describe those objects.</p> <p>ESAR Binary Object Exchange Characteristics</p> <p>ESAR Binary Object Bibliographic Reference (reference Bibliographic Reference Information Data Standard)</p>
<p><b>2. Bibliographic Reference</b></p> <p><i>Definition:</i> The descriptors used to identify and catalog an object.</p> <p>ESAR Bibliographic Reference Descriptors</p>
<p><b>3. Compositing</b></p> <p><i>Definition:</i> The attributes related to the combining of several samples, sub-samples, results or units to produce a single entity</p> <p>Compositing Activity</p> <p>Compositing Date and Time</p>

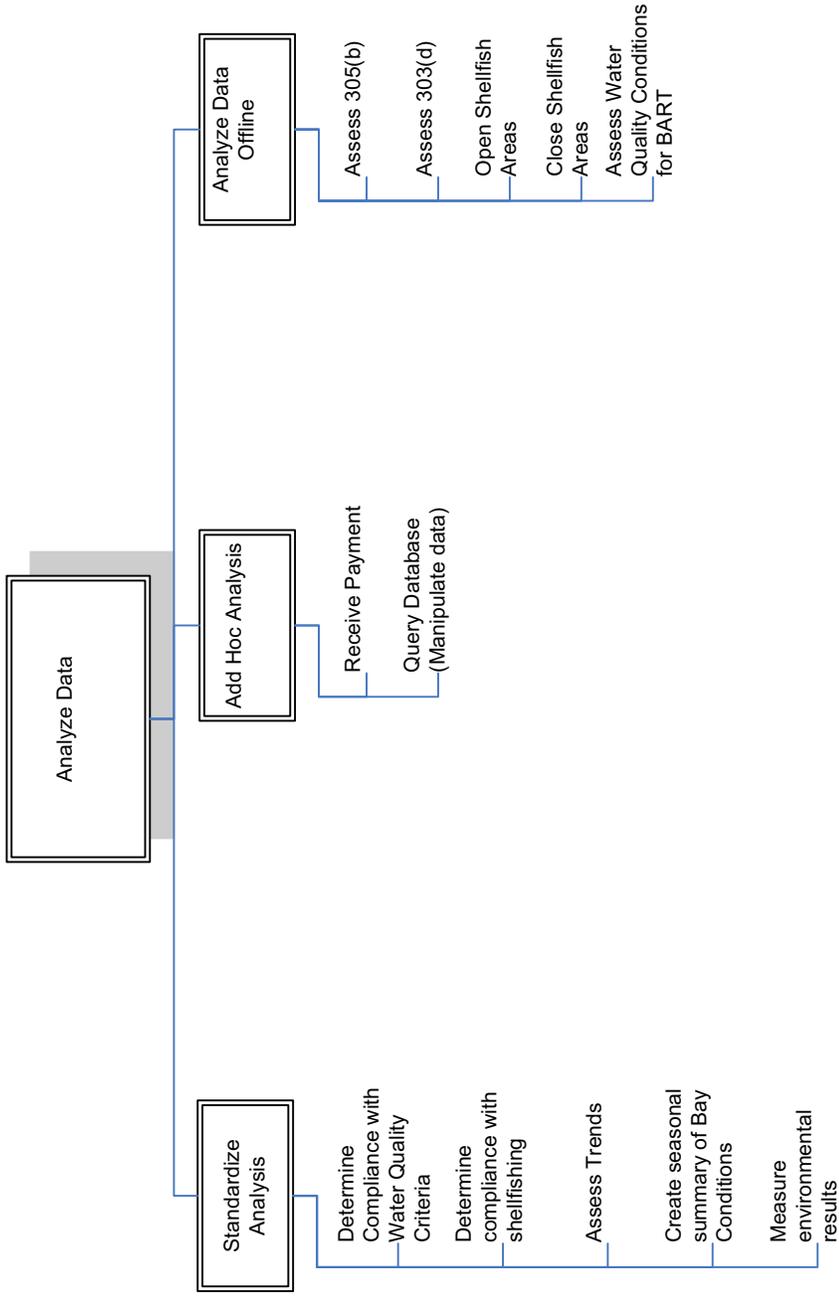
Compositing Component
<b>4. Equipment</b> <i>Definition:</i> Information needed to uniquely identify the apparatus, instrument, or equipment used for the activity. Equipment Identification Equipment Characteristics Equipment Calibration
<b>5. Measure</b> <i>Definition:</i> Identifies the value and the associated units for measuring an observation or analytical result value. Measure Measure QA/QC
<b>6. Method</b> <i>Definition:</i> Identifies the procedures/ processes and references required to determine the methods used to obtain a result. Method Identification Method Reference
<b>7. Quality Assurance and Quality Control</b> <i>Definition:</i> The quantitative statistics and qualitative descriptors that are used to interpret the degree of acceptability or utility of data to the user. Data Quality Indicator
<b>8. Representation of Date and Time</b> <i>Definition:</i> Representation of a point in time in the Gregorian calendar and portion thereof. Date Time
<b>9. Sampling Handling</b> <i>Definition:</i> Identifies sample handling procedures including sample treatment and/or sample preservation. Sample Handling Sample Preservation

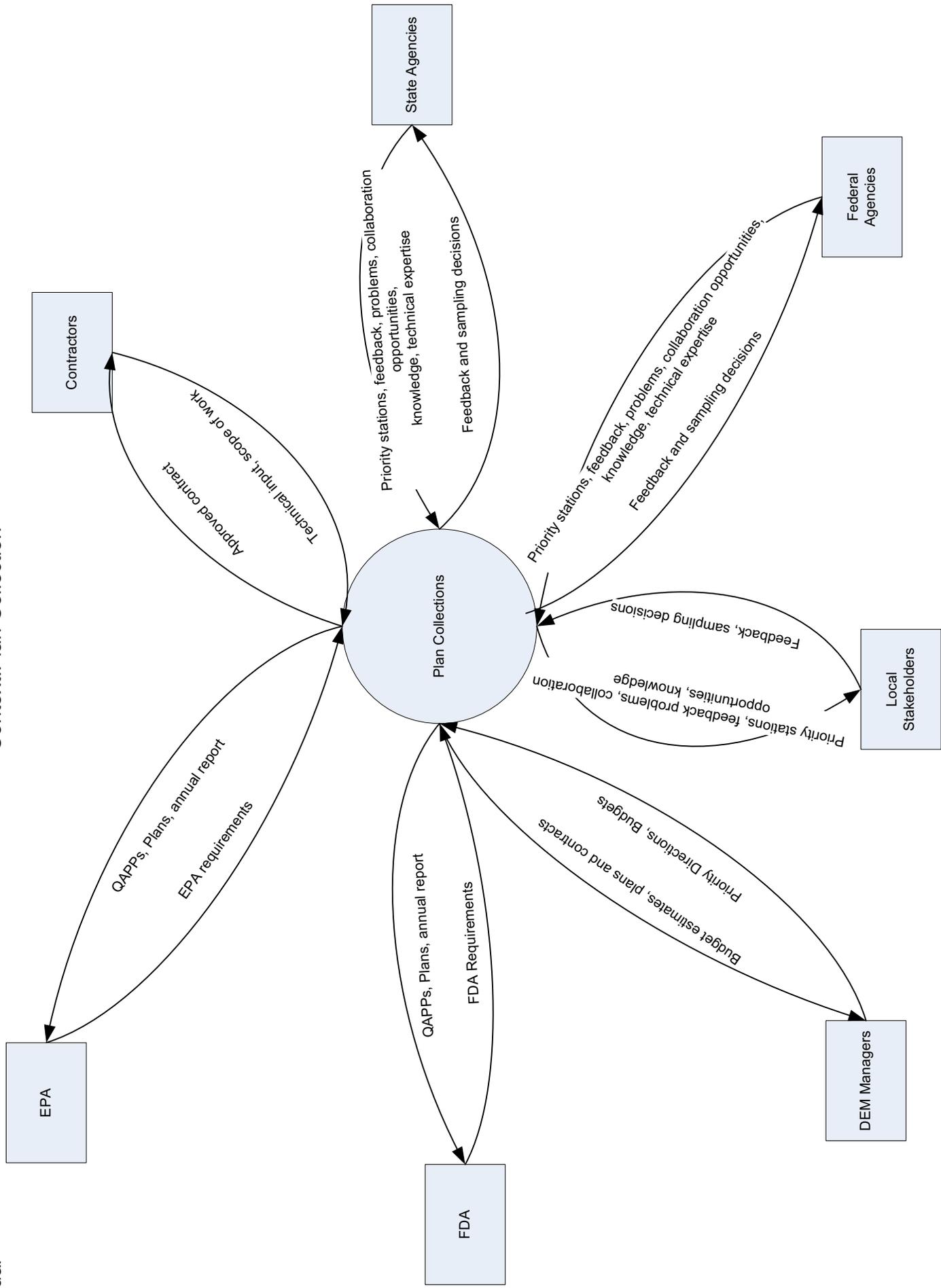


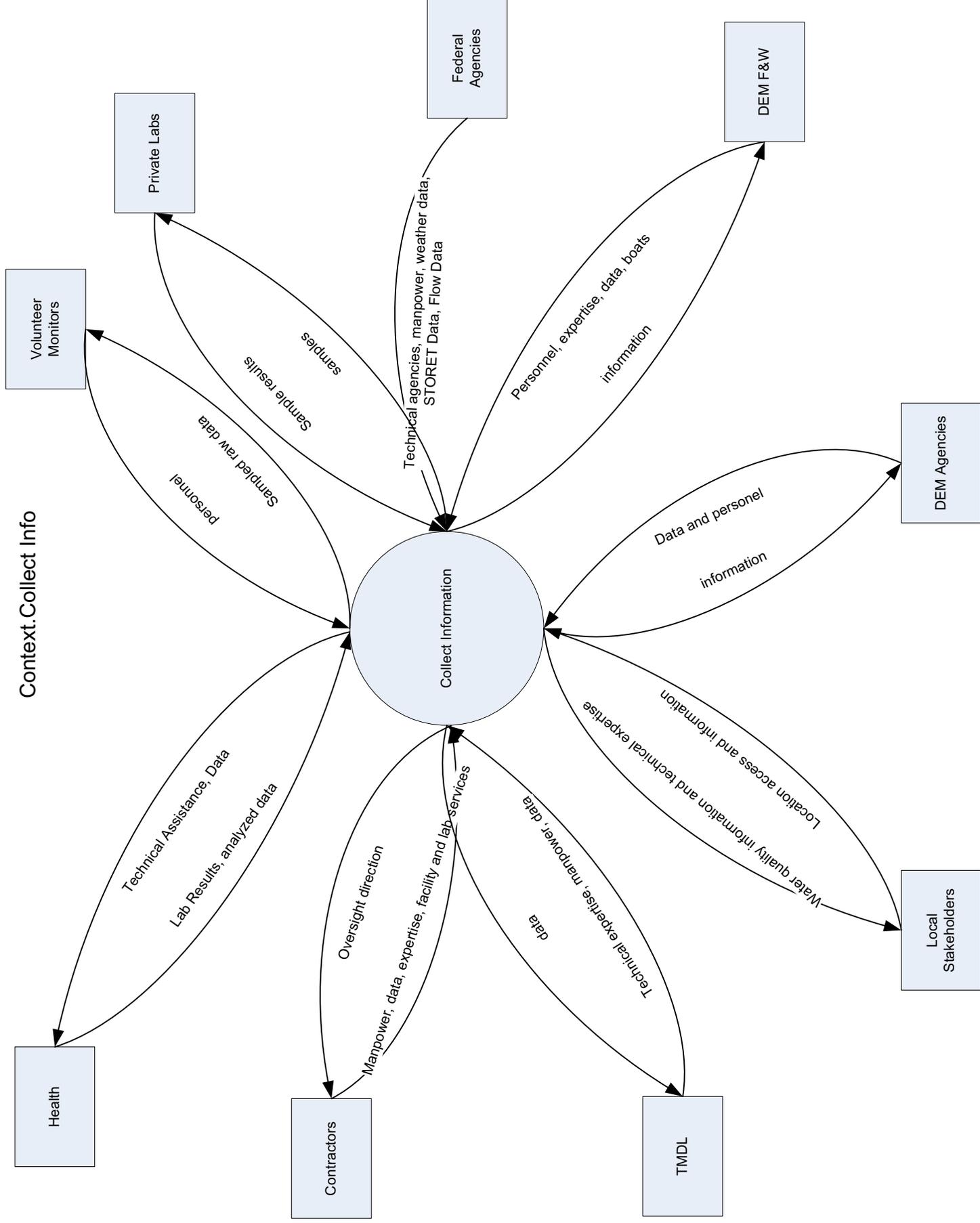
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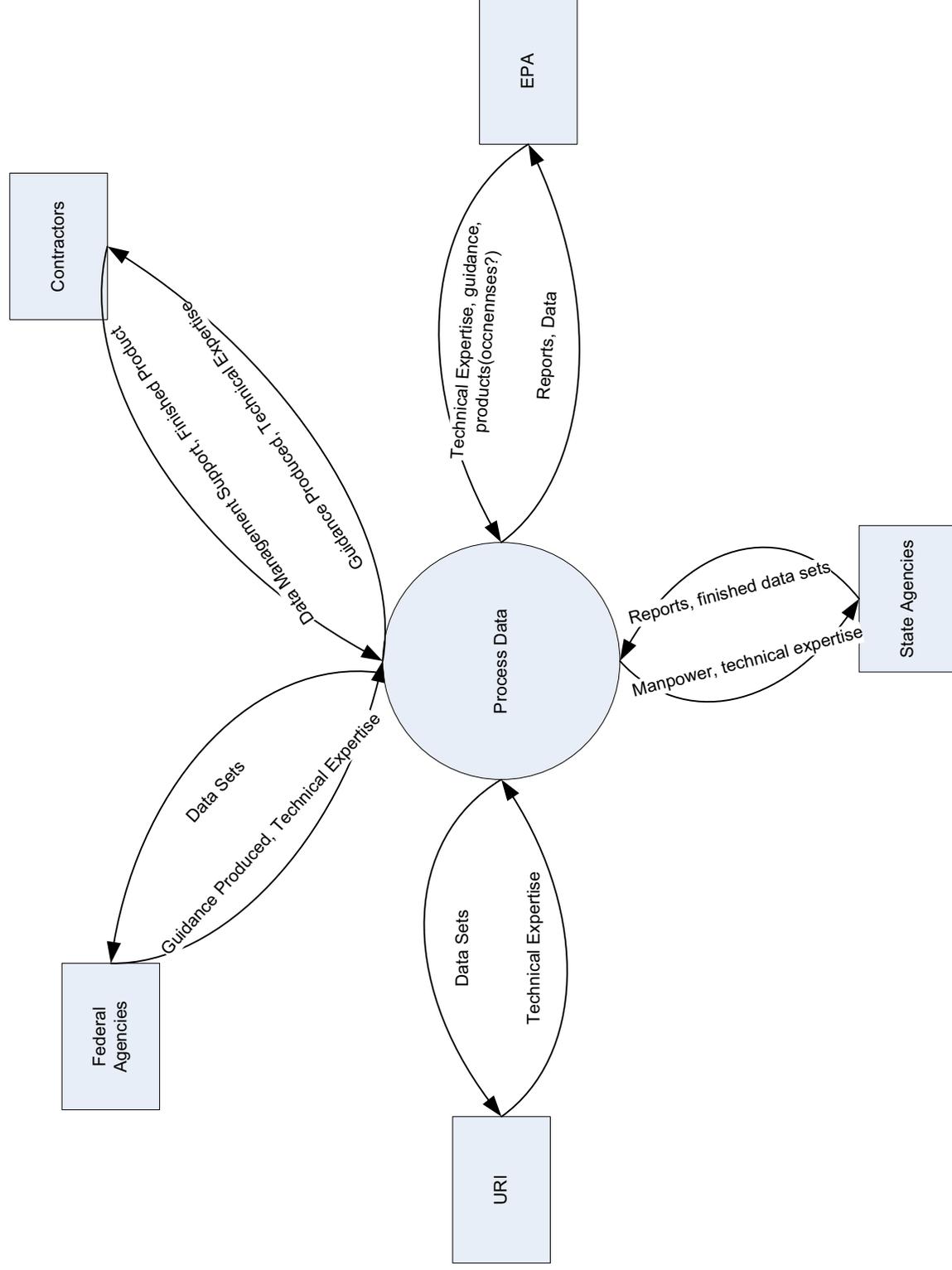


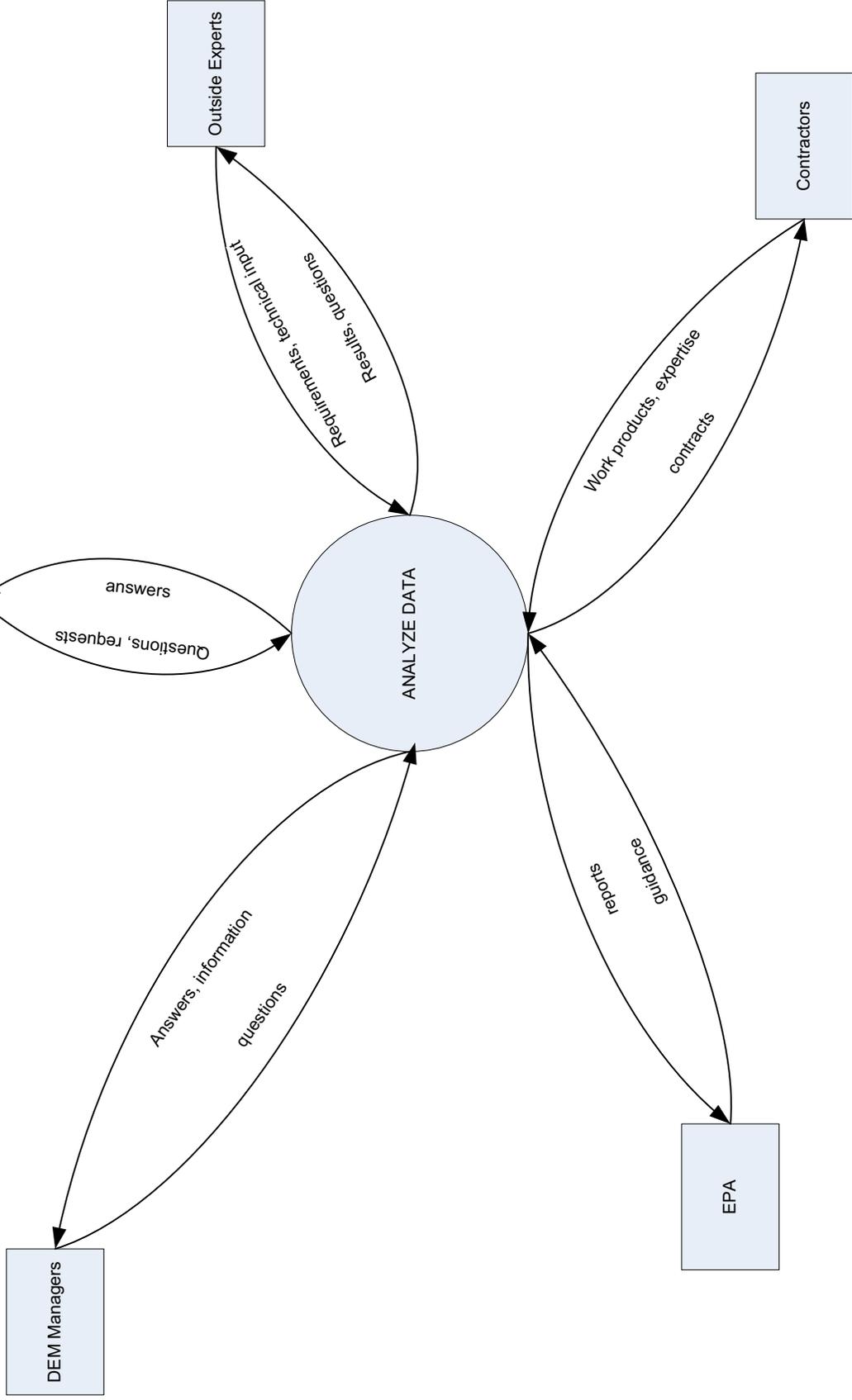


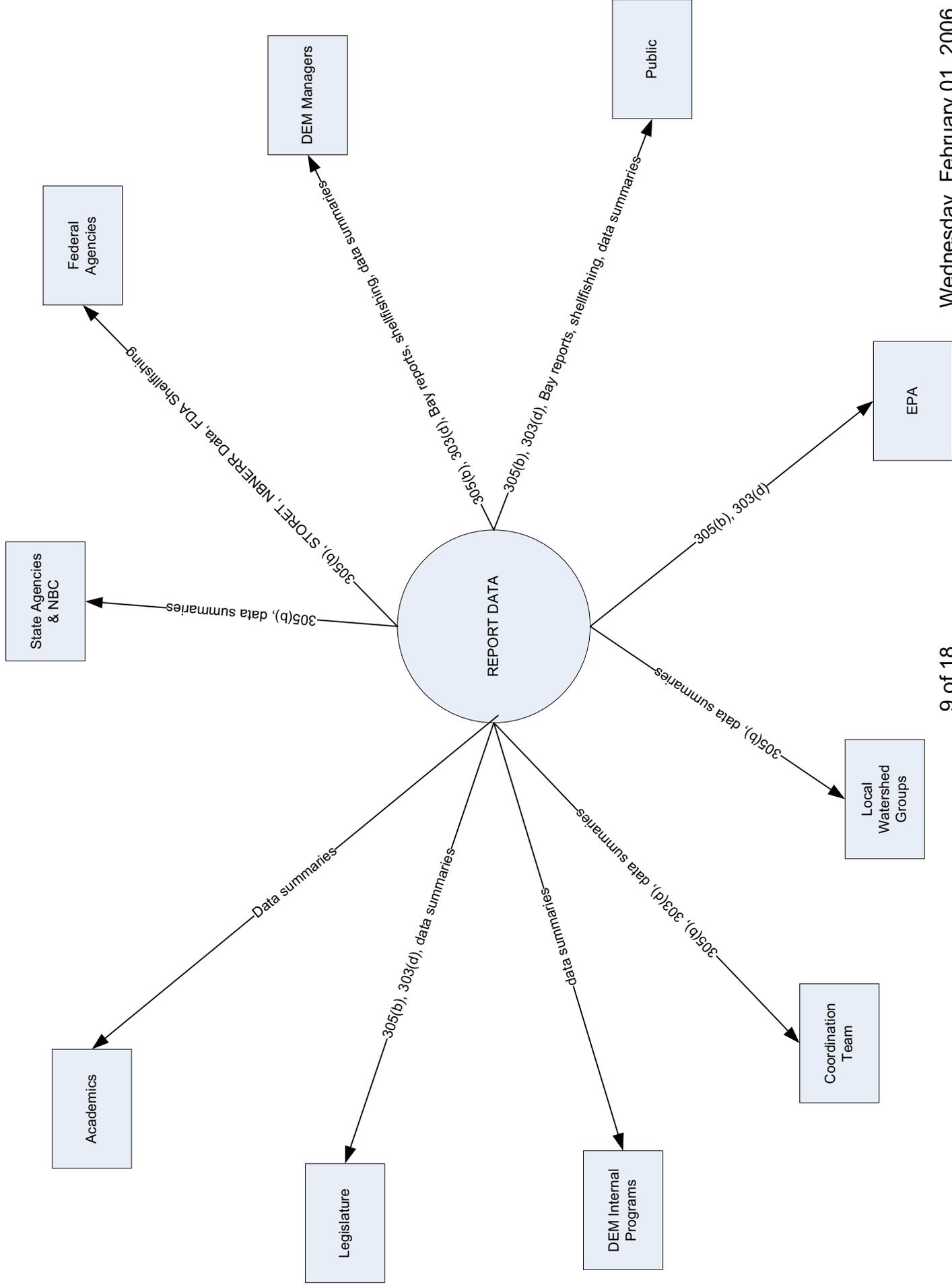




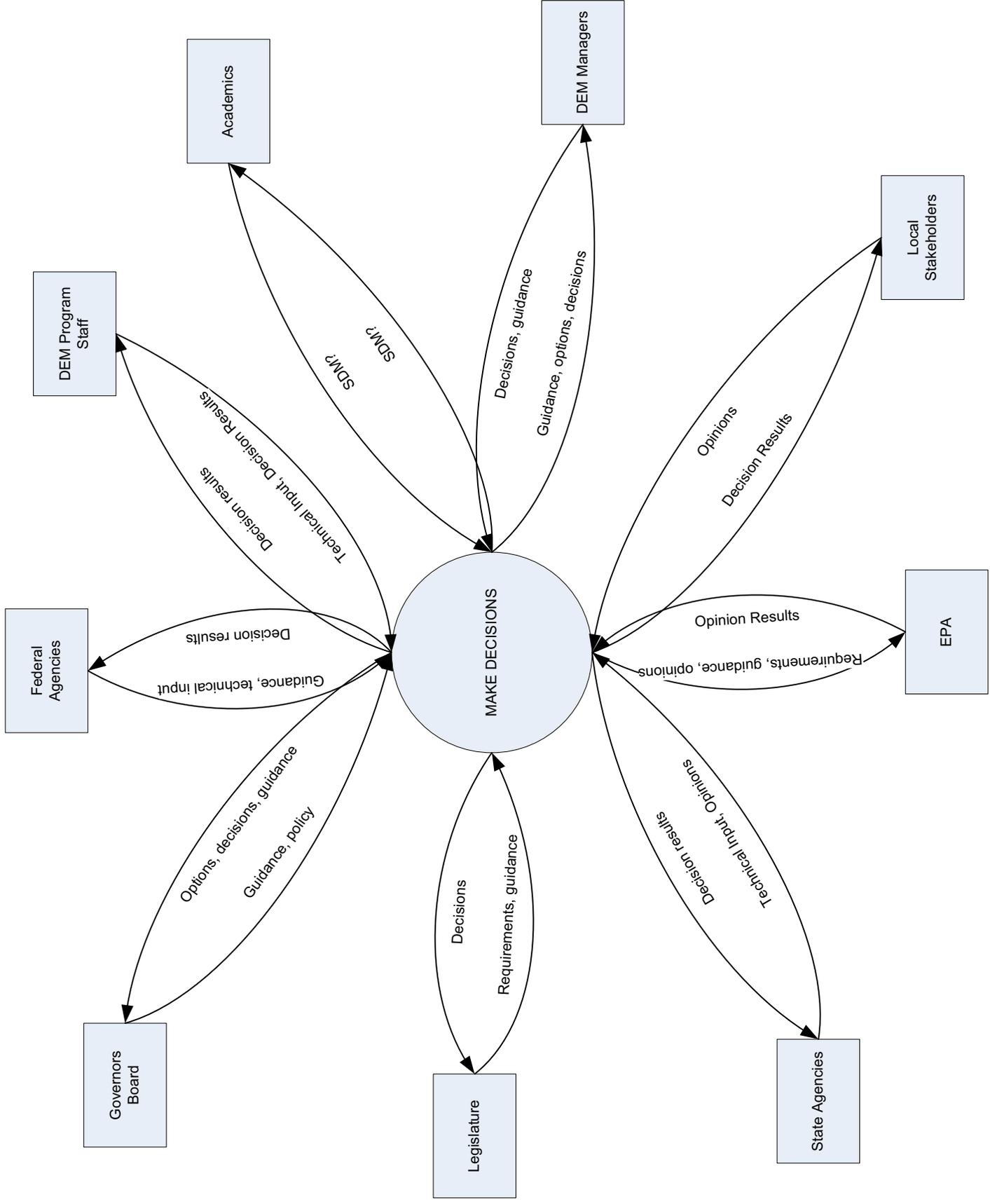


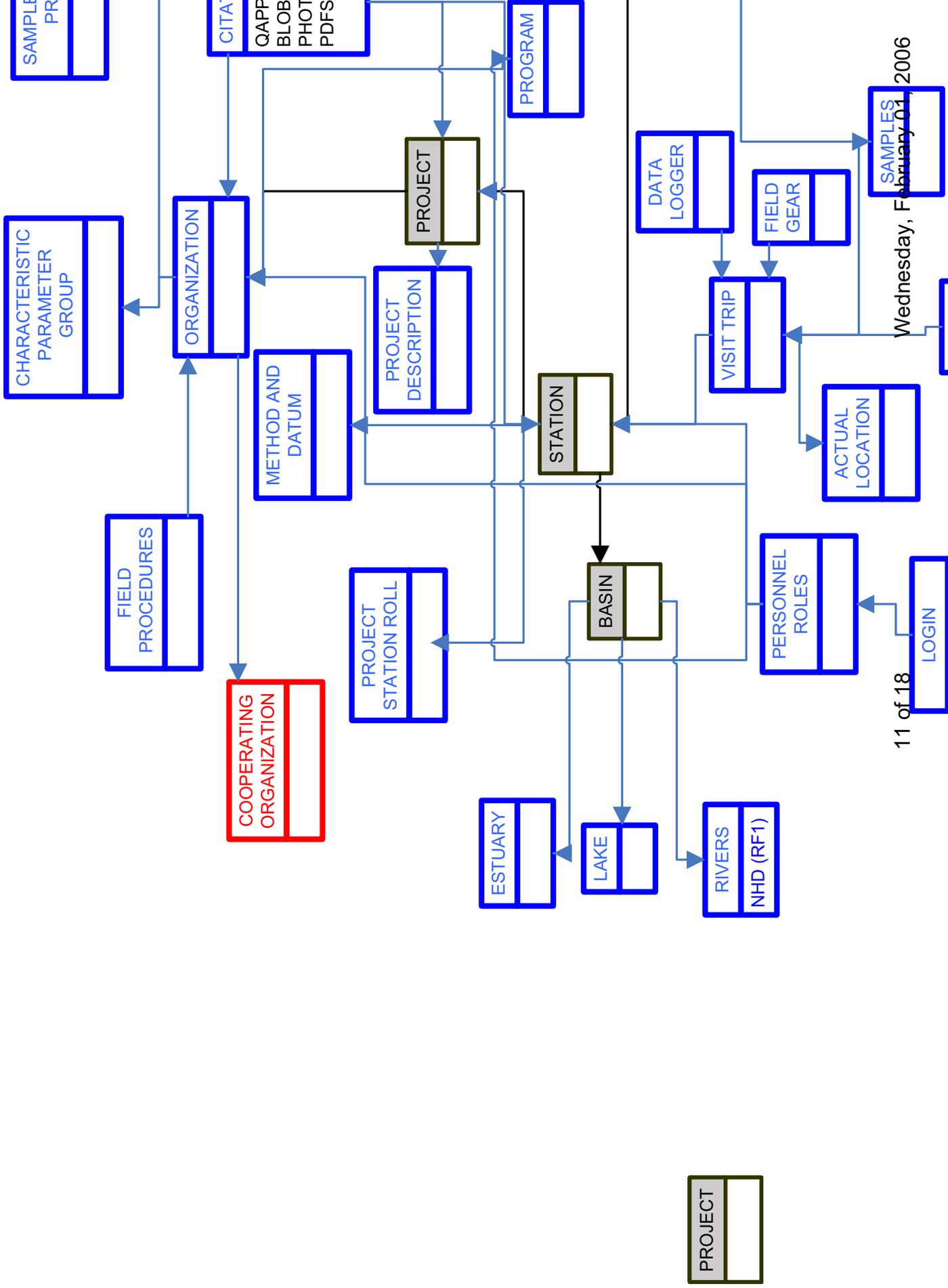


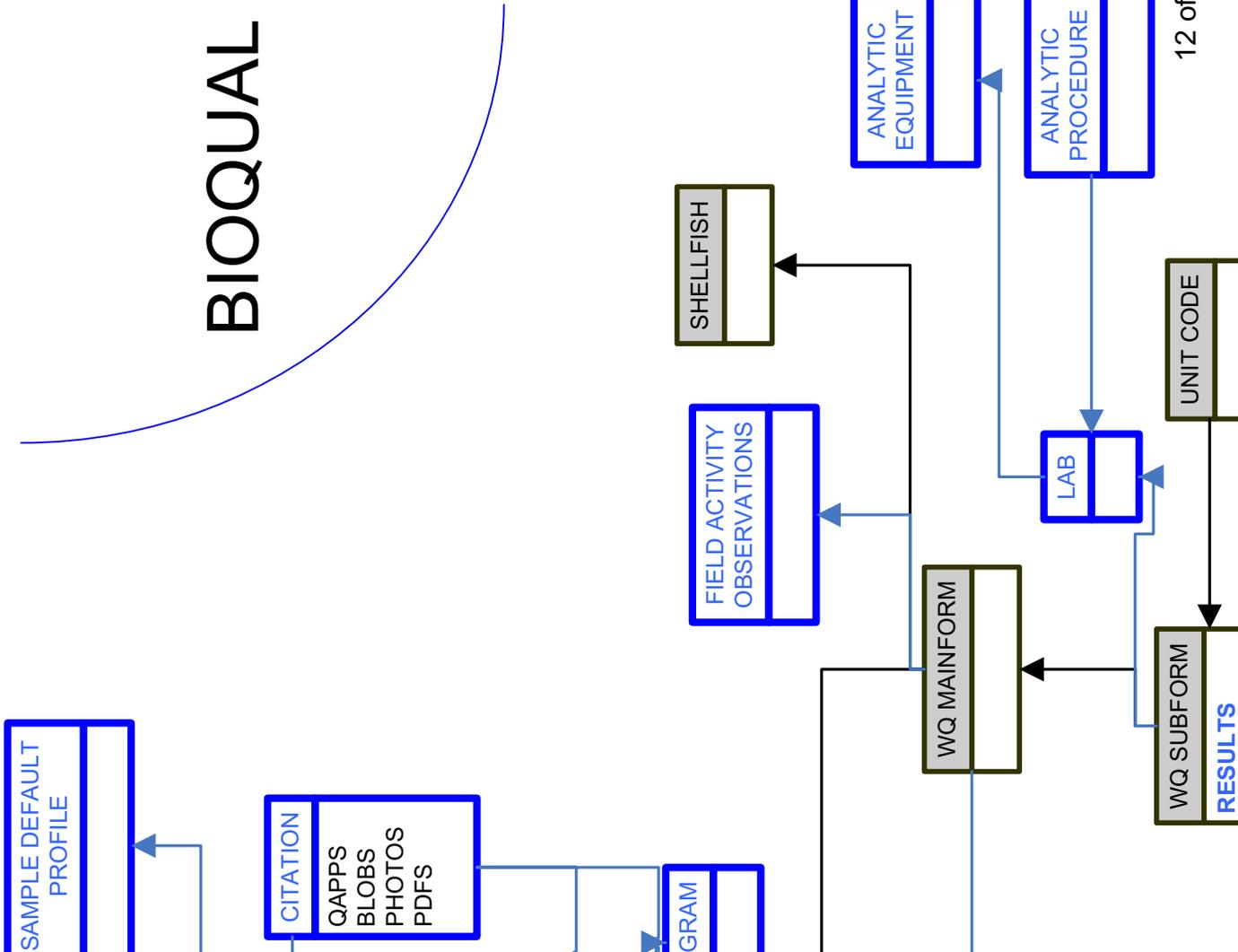


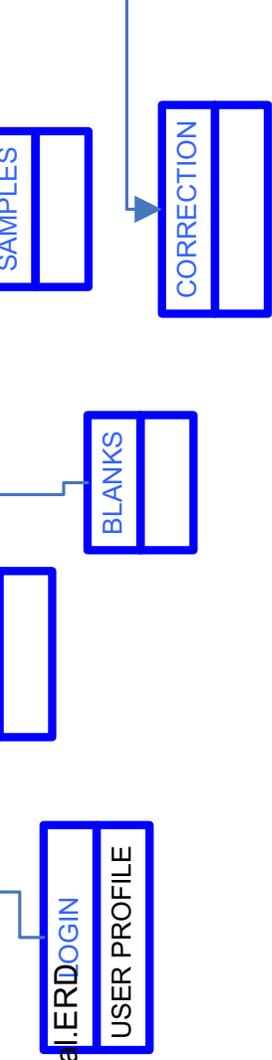


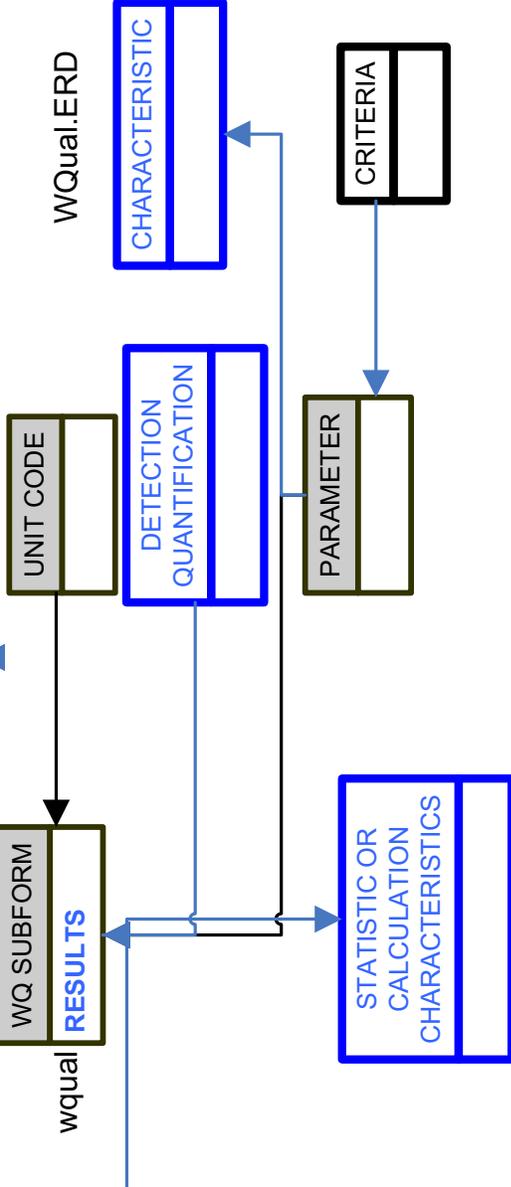
Context. Make Decisions









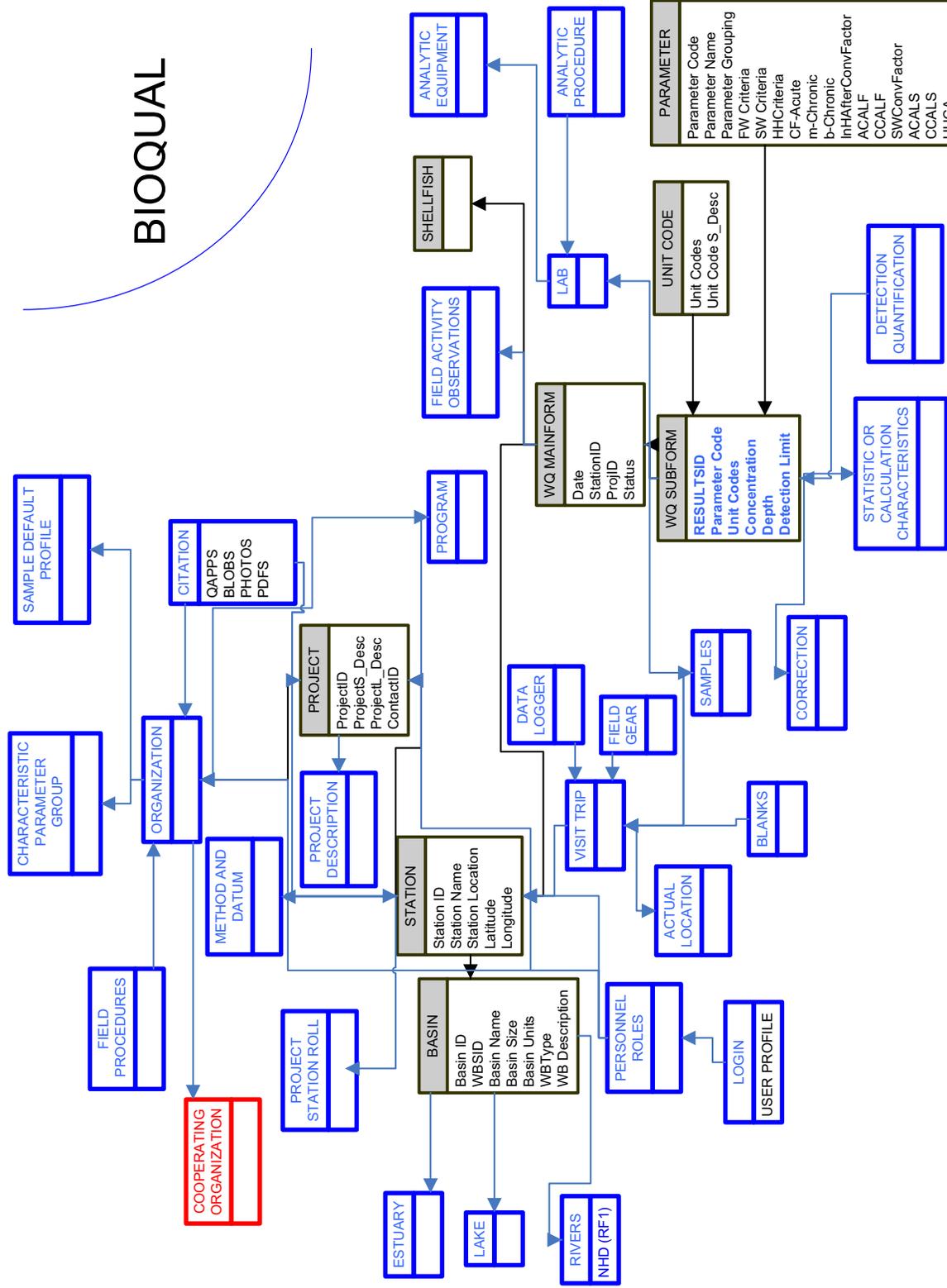












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